



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Fundamentals of Psychology

Course Code: APSY-311

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Define Observation, and also explain its different types.
2. What are the causes of the Distraction of Attention, and how can it be controlled?
3. Briefly explain the characteristics and major functions of different Sensations.
4. Write a short note on Types of Thinking.
5. Differentiate between Depth and Distance Perception with examples.
6. Define and explain the concepts of Retention, Recall, and Recognition.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Briefly explain the Historical Background and School of Psychology.
2. Define Perception. Write a detailed note on the Factors of Perception.
3. Define Learning and explain the different methods of Learning.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Fundamentals of Psychology

Course Code: APSY-321

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Briefly explain the nature and application of Psychology.
2. Differentiate between Central and Peripheral Nervous System.
3. Write a short note on the “case history” and survey methods” in Psychology.
4. Define Perception. Briefly explain the Temporal Perception.
5. Briefly explain the nature and causes of Forgetfulness.
6. Differentiate between Classical and Operant Conditioning.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Define Attention. Write a detailed note on the Factors of Attention.
2. Define Emotions. Write a detailed note on the Physiological Changes in Emotions.
3. Define Thinking. Write a detailed note on Tools of Thinking.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Psycho-Pathology

Course Code: APSY-351

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. What are the significant developments and achievements in the history of Abnormal Psychology
2. What is the criteria of Major Depressive Disorder?
3. Explain Gender Dysphoria.
4. Differentiate between Tolerance and Withdrawal in terms of Substance Abuse.
5. Differentiate Positive and Negative symptoms of Schizophrenia.
6. What is the diagnostic criteria of Post-Traumatic Stress Disorder?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Explain Personality Disorder in detail.
2. Discuss in detail with Somatic Symptoms and related disorders.
3. Write a note on Obsession Compulsion Disorder.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Schools and Perspectives in Psychology

Course Code: APSY-352

Time: 3 Hrs.

Marks: 60

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**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

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**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Differentiate between Classical Conditioning and Operant Conditioning.
2. Explain Carl Roger's theory from a Humanistic Perspective.
3. Discuss the contribution of Al-Ghazali from an Islamic Perspective.
4. What do you know about Structuralism? Discuss the contribution of William Wundt to the field of psychology.
5. Explain the role of Heredity, Genes and Chromosomes as discussed in the Biological Perspective.
6. Briefly explain Id, Ego, and Super-ego with an example.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Write a detailed note on the contributions of Neo-Freudians.
2. Explain major assumptions, major contributions, and basic concepts in Schools and Perspectives.
3. Write a detailed note on the major concept and contribution of Frist Perls in Gestalt Perspective.





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Developmental Psychology (Revised)

Course Code: APSY-353

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- I. Name psychosocial stages given by Erikson's for human development?
- II. What do you know about physical development in the early childhood phase?
- III. Describe physical development and identity formation in adolescent?
- IV. What are the various problems and disturbance which are faced by the adolescents in adolescence phase?
- V. How do people in early adulthood adjust with the occupational and familiar challenges?
- VI. Define Gerontology? What challenges are faced by elderly?

**Q.2. Answer the following questions. (3x10=30)**

1. Elaborate Middle adulthood challenges and threats faced by Pakistani adults?
2. Define Gerontology. What are challenges faced by elderly?
3. Describe early adulthood. Narrate in detail occupational and familial adjustments during early adulthood.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (10x3=30)**

1. What are uses of tests in psychology? Elaborate.
2. What are culture fair tests? Elaborate with the help of example.
3. Describe ethical issues related to informed consent in assessment.
4. Differentiate between projective and self-report tests of personality with examples.
5. Describe split half reliability alongwith Spearman Brown prophecy formula.
6. Differentiate between different types of norms.
7. What is TAT? Who developed this test? Describe its administration and scoring.
8. Differentiate verbal and non-verbal tests of intelligence with examples.
9. Write down the guidelines for item writing.
10. Which types of tests are used in educational settings? Briefly describe.

**Q.2. Answer the following questions. (3x10=30)**

1. Define validity. Name and elaborate different types of validity alongwith examples.
2. Write a detailed note on Minnesota Multiphasic Personality Inventory.
3. Write a detailed note on test construction.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Write a note on Simple random sampling.
2. Discuss the formulation, importance, and types of Hypothesis.
3. Describe briefly how Correlational studies are done.
4. What are the Salient features of the scientific method?
5. Differentiate between Basic and Applied research.
6. Discuss Focus groups in qualitative research.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Discuss the Research Process in detail
2. Differentiate between Stratified and Cluster sampling with examples.
3. Write a detailed note on “Grounded Theory”.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (10x3=30)**

1. Differentiate between interval and ratio scales of measurement with examples.
2. What are descriptive statistics. Write down names of descriptive analyses.
3. Define mode. Write down its formula and elaborate.
4. Define z scores and its formula. What is the importance of z scores?
5. Define standard deviation and write down its properties.
6. What are the differences between parametric and non-parametric tests?
7. Write down steps in construction of frequency polygon.
8. Define normal distribution? Write down its properties.
9. Define correlation, differentiate between Pearson and Spearman correlation.
10. What are the differences between t test and ANOVA?

**Q.2. Solve the following questions. (3x10=30)**

1. Following are the scores on screen time (x) and a cognitive task (y). Find correlation coefficient between both.

X	3	8	10	8	4	7	4	5	5
Y	11	19	10	9	14	13	20	20	25

2. A study is conducted to see if a sample of participants has optimal level of intelligence or not. A standard test of intelligence produces  $\mu = 105.21$ . A sample of 25 participants had a mean of 114.5 with SD = 36.3. Use alpha level of .01 to check if the participants mean is different from the test mean or not.
3. The following data represents achievement scores of participants studying in three different learning programs. Run one-way ANOVA to find if there are any differences in level of achievement between three learning programs, at  $\alpha = .05$ .

Program A	Program B	Program C
2	5	8
3	9	6
8	10	12
6	13	11
5	8	11
6	9	12



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Arabic-V

Course Code: ARB-301

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(5x6=30)

سوال نمبر 1: نیچے دیئے گئے اجزاء کے جوابات لکھئے۔

(i)

عربی میں ترجمہ کیجیے۔

- (a) I am a teacher. (b) Where is my book? (c) Ali is my brother  
(d) Be quiet, please. (e) She is sick. (f) I'll go at three o'clock.

(ii)

انگریزی میں ترجمہ کیجیے۔

- (أ) مَنْ ذَلِكَ؟ (ب) أَيْنَ تَسْكُنُ؟ (ج) الدِّرَاسَةُ خَمْسَةُ أَيَّامٍ.  
(د) مَتَى يَرْجِعُ عَلِيٌّ مِنْ لَاهُورِ؟ (هـ) أَحْبَبْتُ الْقِرَاءَةَ. (و) مَرِّمٌ تُشَاهِدُ التَّلْفَازَ

- (iii) اکتب/اكتبی ستہ أسطر فی ترجمۃ المنفلوطی. (منفلوطی کے حالات زندگی کے حوالے سے چھ سطریں تحریر کریں)  
(iv) اکتب/اكتبی ستہ أسطر فی ترجمۃ خنساءؓ. (خنساء رضی اللہ عنہا کے حالات زندگی کے حوالے سے چھ سطریں تحریر کریں)  
(v) عَرِّفْ / عَرِّفِیْ بزمیر بن أبی سلمی فی ستہ أسطر (زمیر بن ابی سلمی کا چھ سطروں میں تعارف کروائیں)

(3x10=30)

ذیل میں دیئے گئے سوالات کے تفصیلاً جوابات لکھئے۔

- سوال نمبر ۲: عربی زبان کی اہمیت و ضرورت ”پر تفصیلی نوٹ لکھیے۔  
سوال نمبر ۳: ابوتام کے حالات زندگی اور شاعری ”پر تفصیلی نوٹ لکھیے۔  
سوال نمبر ۴: جاحظ کی زندگی اور ادبی آثار ”پر تفصیلاً روشنی ڈالیے۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Credit Management

Course Code: BBA-301

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Components of commercial credit**
- II. Working capital Management**
- III. Collection policy appraisal**
- IV. Preparation of CLP**
- V. Determination of collateral securities**
- VI. Types of bank credit**

**Q.2. Answer the following questions.**

**(3x10=30)**

- 1. Define credit management and explain the role and function of credit department?**
- 2. Briefly explain the role of working capital management in the light of credit management?**
- 3. Explain the models of creating changes on securities commercial Vs. Bank credit?**



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Axiology
- II. Benefits of Literature Review
- III. Pragmatism
- IV. Rating scale
- V. Types of research questions
- VI. Ranking scale

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Discuss in detail the Methods of data collection in business research
2. What are the different types of Research Designs in business research? Explain with help of suitable examples?
3. What are the different types of measurement scale in business research? Explain each with the help of suitable examples



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- i. Explain very briefly, the formation process of a company
- ii. Discuss the contents of a memorandum of association.
- iii. Under what grounds, a statement in lieu of prospectus is issued? explain.
- iv. Elaborate different kinds of share capital of a company.
- v. Discuss the rights of a shareholder of a company.
- vi. Very briefly explain the fundamentals of negotiable instruments.

**Q.2. Answer the following questions. (3x10=30)**

1. What is Certificate of Commencement? Discuss the conditions to be met to obtain the certificate of commencement.
2. What do you mean by Company Secretary? Discuss his qualification, appointment, term of office, and any of his five duties.
3. How a company can be incorporated.





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Web Engineering

Course Code: BBA-304

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. How do you write a comment in HTML?
2. Explain the difference between radio button and checkbox?
3. Explain the <iframe> and <video> elements, including their attributes.
4. What is the purpose of the 'Request' object in classic ASP?
5. State the difference between HTML4 and HTML 5.
6. What is the difference between session state and application state?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Write HTML code to create a form that allows users to enter his/her name, email, profile and upload a file to the server. Include a submit and reset button.
2. Write a code to start a session and set a session variable named "user\_id" with the value "12345". Moreover, write a code to retrieve the value of the session variable "user\_id" and display it on the webpage.
3. Write a code to update an existing record in a MySQL database based on the student rollNumber, received from HTTP GET request. Design appropriate HTML interfaces as well.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Difference between HRD and HRM?
- II. Why do people with low-efficacy perform more poorly in training programs than those with high self-efficacy"?
- III. Differentiate between performance management and performance appraisal.
- IV. Write down two basic types of compensation
- V. What is 360-degree performance appraisal method?
- VI. What is Organizational Culture?

**Answer the following questions.**

**(3x10=30)**

**Q.No.2:** Explain the problems faced during performance appraisal and also suggest possible solutions to those problems.

**Q.No.3:** What is an incentive plan? Explain in detail the different types if incentive plans

**Q.No.4:** What is HRM? What are major Human Resource Challenges? Discuss briefly.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Bacteriology & Virology

Course Code: BOT-301 A

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(5x6=30)**

1. TRANSDUCTANT & CONJUGANT
2. TEMPERATE & VIRULENT PHAGES
3. CHEMOTROPHS & LITHOTROPHS
4. FACULTATIVE HALOPHILES & OBLIGATE HALOPHILES
5. NECROSIS & CHLOROSIS

**Q.2. Answer the following questions.**

**(5x6=30)**

- i. Describe various carriers of viral infection in plants.
- ii. Write about various growth phases in BACTERIAL life cycle.
- iii. What are the various symptoms of bacterial infections in plants?
- iv. What do you understand by the term BACTERIAL TRANSFORMATION? Explain its mechanism.
- v. Explain various classes of bacteria on the basis of flagella.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Explain the following:**

**(15x2=30)**

1. Define taxonomy? Write the names of Five International Taxonomists.
2. What is meant by Melbourne code?
3. Differentiate between paratype and neotype?
4. Describe intended keys
5. Write floral formula and floral diagram of family Malvaceae?
6. Define Bracketed keys?
7. Define coenospecies with example?
8. Write the contribution of Engler and Prantl in Plant Systematics?
9. Define Herbarium? What is its purpose?
10. Draw neat and clean floral diagram of *Cassia fistula* L.?
11. Enlist names of families of Monocot and Dicot?
12. Write economic importance of family Poaceae?
13. Write down the vernacular and botanical names of 4 members of family Asteraceae?
14. What are the advantages and disadvantages of using intended keys?
15. What are the main features of natural system of classification?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Define Nomenclature? Discuss the principles of the ICBN in detail.
2. What is meant by species and sub-species? What are the key characteristics of an ideal species?
3. Write a detailed note on family Rosaceae? Explain with the help of floral diagram?



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Autecology

Course Code: BOT-305 A

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Discuss the modification of habitat after crown fire.
- ii. Distinguish between photoperiodism and thermoperiodism.
- iii. What are the ecological response of plants to warm, chilling and freezing temperature?
- iv. What are the impacts of herbivorous animals on vegetation?
- v. Describe the causes and reclamation methods of salinity.
- vi. Discuss the cardinal temperatures.

**Answer the following questions.**

- |              |   |                   |
|--------------|---|-------------------|
| <b>Q. 2.</b> | <b>(a) Discuss the plant adaptations related to fire.</b>                               | <b>(04 Marks)</b> |
|              | <b>(b) Compare the Tropical, Temperate and Polar Regions.</b>                           | <b>(03 Marks)</b> |
|              | <b>(c) What are the different forms of atmospheric moisture?</b>                        | <b>(03 Marks)</b> |
| <b>Q. 3.</b> | <b>(a) How temperature plays an important role in plant distribution and diversity.</b> | <b>(05 Marks)</b> |
|              | <b>(a) Describe in detail the Water logging and Salinity in soil.</b>                   | <b>(05 Marks)</b> |
| <b>Q. 4.</b> | <b>Write a note on following</b>  |                   |
|              | <b>(a) Eco-physiological responses in pants.</b>  | <b>(04 Marks)</b> |
|              | <b>(b) Formation of wind.</b>   | <b>(03 Marks)</b> |
|              | <b>(c) Plant water relationships.</b>   | <b>(03 marks)</b> |



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (6x5=30)**

- I. What are palynomorphs? Briefly describe various categories of palynomorphs?
- II. How are the plant compressions formed? What do they depict?
- III. What is meant by rate of evolution? Explain the types.
- IV. Discuss various types of xylem maturation pattern? Support your answer with the help of neat and labeled diagrams.
- V. What are the salient features of Selaginellales? Also provide its evolutionary significance with special reference to the evolution of seed habit.
- VI. How do the new species arise? Briefly explain various phenomena.

**Q.2. Answer the following questions. (3x10=30)**

1. Write a comprehensive note on various types of steles. Support your answer with the help of neat and labelled diagrams.
2. What are aquatic ferns? Discuss in detail their vegetative and reproductive characteristics along with examples.
3. Describe the morphological features of *Pseudobornia ursina* in detail. What are the probable plant affinities of Pseudoborniales? Discuss.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (15x2=30)**

1. What are carbohydrates write down their importance?
2. Write the name and characteristics of non-polar aliphatic R group amino acids?
3. Why carbohydrates are not a good source of energy as compared to triacyl glycerides?
4. Why *Trichonympha*, bacteria are considered as beneficial micro-organism?
5. Differentiate between the terms sphingolipds and glycerophospholipids.
6. Why saturated fatty acids have higher melting points?
7. What is Howarth perspective formula?
8. Draw the structure of any two six carbon sugars.
9. Explain the phenomenon of saponification and rancidity?
10. Define drying oils.
11. What are sphingolipids? What is their importance?
12. How we can determine no. of amino acid in a polypeptide chain?
13. Define the terms active site, substrate, product and intermediate.
14. Explain DNA has a distinctive base composition?
15. Give various conclusions of Chargaff rules.

**Q.2. Answer the following questions. (6x5=30)**

1. What are polysaccharides also write down the homopolysaccharides with example and chemical structure?
2. Briefly explain the contribution of Rosalind Frankline and Maurice Wilkins in DNA structure studies?
3. Write down various classes of enzymes also write the type of reaction they catalyze?
4. Differentiate between A, B and Z form of DNA?
5. Write down the classification of amino acid on the basis of R group.
6. Explain simplified nomenclature for fatty acid with examples?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

1. Differentiate method of Zoosporogenesis in Oomycota and Chytridiomycota.
2. Write a note on distinguishing characteristics of Saprolegniales.
3. What are basis of classification in Chytridiomycota. How it is different from Hyphochytridiomycota?
4. Describe role of Arbuscular Mycorrhizae (AM) in agriculture.
5. Differentiate Kingdom Straminopila from Kingdom fungi.
6. Describe the casual organism and symptoms of Downy mildews.

**Answer the following questions.**

Q. No. 2: (a). Draw and describe life cycle of *Saprolegnia*. (05)

(b). Write a note on economic importance of lower fungi. (05)

Q. No. 3: What are noteworthy features of Entomophthorales? Describe their use in biocontrol of insects. (10)

Q.No. 4. Describe distinguishing features of Zygomycota. Draw life cycle of *Rhizopus*. (10)





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Language of Newspapers

Course Code: BSAR-301

Time: 3 Hrs.

Marks: 60

Roll No. ....

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

السؤال الأول: ترجم المصطلحات التالية إلى العربية: (درج ذیل اصطلاحات کا عربی میں ترجمہ کریں) (15x2=30)

- |                    |                            |
|--------------------|----------------------------|
| 1- The Media       | 9- High Level Sources      |
| 2- Newspaper       | 10- Interview              |
| 3- To express      | 11- To deny                |
| 4- The Arab league | 12- The Muslim Brotherhood |
| 5- The Labor Party | 13- The Security Council   |
| 6- Reputation      | 14- Personality            |
| 7- Campaign        | 15- Election               |
| 8- Seat            |                            |

ذیل میں دیے گئے سوالات کے تفصیلاً جوابات لکھئے۔ (3x10=30)

السؤال الثاني: عرّف بالصحافة وبين أنواعها بالتفصيل. (صحافت کی تعریف کریں اور اس کی اقسام کے بارے میں تفصیل سے عربی میں لکھیں)

السؤال الثالث: ماذا تعرف عن جريدة الأهرام. أكتبه بالتفصيل. (الأهرام اخبار کے بارے میں آپ کیا جانتے ہیں تفصیل سے عربی میں لکھیں)

السؤال الرابع: أكتب مقالا حول كل من الصحيفة و الجريدة والمجلة. (اخبار۔ صحیفہ اور مجلہ پر مضمون لکھیں)



(15x2=30)

السؤال الأول: أجب عن الأسئلة التالية باختصار:

- 1- أين تقع مدينة الخرطوم ؟
- 2- ما اسم عاصمة دولة تونس ؟
- 3- متى تحققت الوحدة اليمنية بين الجمهورية العربية اليمنية وجمهورية اليمن الديمقراطية الشعبية ؟
- 4- كم دولة تقع في الجزيرة العربية في العصر الراهن ؟
- 5- في أي منطقة تقع فلسطين ؟
- 6- أين تقع مدينة بغداد ؟
- 7- ما اسم عاصمة دولة اليمن ؟
- 8- كم دولة تقع في الهلال الخصيب في العصر الراهن ؟
- 9- ما هي عملة الجزائر ؟
- 10- في أي قارة تقع لبنان ؟
- 11- كم مساحة للمملكة العربية السعودية ؟
- 12- ما هي عملة الكويت ؟
- 13- كم مساحة لدولة الكويت ؟
- 14- كم إمارة تحتوي عليها الإمارات العربية المتحدة ؟
- 15- اكتب الموقع الجغرافي لدولة قطر.

أجب عن السؤالين من الأسئلة التالية- (مدرج ذيل سوالات میں سے دو کا مفصل جواب دیں)

- (10) السؤال الثاني: اكتب موقعا جغرافيا للمملكة العربية السعودية؟ ماذا تعرف عن اقتصادها؟ اكتب بالتفصيل.
- (10) السؤال الثالث: ماذا تعرف عن الإمارات العربية المتحدة؟ اكتب بالتفصيل.
- (10) السؤال الرابع: ماذا تعرف عن جامعة الدول العربية؟ اكتب اسماء جميع أعضائها.



السؤال (1)

15x2=30

1. هل اللغة العربية من اللغات السامية؟
2. ماذا تعرف عن قواعد التنظيم في اللغة العربية.
3. ما الأوزان الصرفية؟
4. اكتب/ي موجزاً عن اللغة الهندية؟
5. عرّف/ي باللغة الإنجليزية بالإيجاز .
6. ما هي المخارج التي تستخدم للأصوات؟
7. إلى أي مجموعة من مجموعات اللغة تنسب اللغة العربية؟
8. ما هي اللغات الحية المنتشرة في أرجاء العالم بشكل واضح؟
9. هل غير مصطفى كمال الرّسم الإملائي للغة التركية؟
10. ما هي معرفتك بعلم الصرف؟
11. ما هي حروف الهجاء الأردية؟
12. كم حرفاً هجائياً في اللغة العربية؟
13. ما هي الحروف الهجائية في اللغة البشتوية؟
14. اكتب/ي السطرين عن اللغة الصينية.
15. ما هو علم اللغة؟

السؤال (2) ما هي اللغة وما هي وظائفها، اكتب/ي بالتفصيل. (10)

السؤال (3) اكتب/ي مقالاً عن اللغة العربية وتاريخها (10)

السؤال (4) تركي زبان کاتعارف کرائے۔ (10)



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Applied Grammar – I

Course Code: BSAR-304

Time: 3 Hrs.

Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

و قد اتفق كثير من التائب، فإذا غاب أحدكم عن مجلس الرسول الكريم حضر جازء أو أخوه، فيخبر الأول بما دار في المجلس من حديث، وما نزل من آية. وهؤلاء هم القراء قد انقطعوا إلى العلم، فإذا جئهم الليل انطلقوا إلى معلم لهم في المدينة، فيدرسون الليل حتى يضيحوا. وما من أخير في المدينة إلا و يعرف الحلال والحرام، وما يتعلق بحياته، و جزفت. ويحفظ من القرآن ما يقوم به في صلاته، ثم هو مستمير في طلب العلم، يزداد كل يوم فقهًا في الأحكام، و رؤسوخًا في الدين، و جزصًا على العمل، و شوقًا إلى الآخرة، و رغبة في الثواب، و علمهم بالفضائل أكثر من علمهم بالمسائل. و إذا تعلم أحد منهم شيئًا من الدين أسرع إلى إخوانه يعلمهم؛ لأنه سيع "ألا فليبلغ الشاهد الغائب، فرب مبلغ أوعى من سامع" و سيعوا بينهم يقول: "إنما بعثت معلمًا و سيعوه يقول: "لا حسد إلا في اثنين رجل آتاه الله مالا فسلطه على علقته، و رجل آتاه الله الحكمة فهو يقضي بها، و يعلمها". وهكذا انقسم المسلمون في المدينة بين طالب و معلم، فإما طالب و إما معلم، بل كل واحد منهم طالب و معلم في وقت واحد، يأخذ من مكان، و يدفع إلى مكان. هل عرف التاريخ مدرسة أوسع من هذه المدرسة النبوية التي يقرأ فيها التاجر، و الفلاح، و الأجير، و الصانع، و المحترف، و المشغول، و الشاب الناهض، و الشيخ الفاني؟ يتعلمون فيها جميع قواعدهم، فالأذن تشفع، والعين تبصر، والقلب يشعر، والعقل يفكر، والجوارح تفعل.

السؤال الاول:

اقرأ هذه الفقرة واستخرج منها ما يلي:

- (i) ثلاثة مركبات عطفية (3)
- (ii) أداة الاستفهام (1)
- (iii) ثلاثة مركبات إضافية و استخدامها في جملك (3)
- (iv) ثلاثة مركبات توصيفية (3)
- (v) ضميران منفصلان (2)
- (vi) ضميران متصلان (2)
- (vii) اسم الإشارة (1)
- (viii) فعلا مضاعفا (1)
- (ix) الحروف الأصلية لهذه الكلمات: انقطعوا - يتعلق - مستمير - يبلغ - التائب - أسرع (6)
- (x) مفردات الجموع: القراء - فضائل - مسائل - قوى - انطلقوا - المسلمون - (6)
- (xi) عدد الأحاديث النبوية ﷺ الواردة في الفقرة. (2)

السؤال الثاني:

ميز بين الفعل الصحيح والفعل المعتل مع الأمثلة. (7)

السؤال الثالث:

استخدم خمسة ضمائر الرفع المتصلة بالأفعال الصحيحة. (5)

السؤال الرابع:

ماهي أدوات الاستفهام؟ وضح بالأمثلة. (8)

السؤال الخامس:

ماهو إعراب المفعول لأجله؟ أكتب ثلاثة أمثال. (5)

السؤال السادس:

ماهي حروف العطف؟ استخدمها في جملك. (5)



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Arabic Composition-I

Course Code: BSAR-305

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

سوال نمبر 1: نیچے دیئے گئے اجزاء کے مختصر جوابات لکھئے۔

(5x4=20)

الف) حکایات کو ملحوظ رکھتے ہوئے عربی میں جواب دیجئے۔

1: اکتب/اكتبی نصیحتین نصح بهما الأب ابنه.

2: کیف فاز الابن فی الامتحان؟

3: اکتب/اكتبی بیتاً بمناسبة العيد.

4: من یخلّد ذکریات الآباء المتوفین؟

5: أي مجموعة قصصية طلبها الطالب لنفسه بإرسال الرسالة؟

(5x2=10)

ب) ان الفاظ کو اپنی جانب سے عربی جملوں میں استعمال کریں۔

1: مسرور 2: قرية 3: الجامعة 4: تخرج 5: أحتاج

(3x10=30)

ذیل میں دیئے گئے سوالات کے تفصیلاً جوابات لکھئے۔

سوال 2: اکتب/اكتبی طلباً إلى رئیس القسم للاشتراك فی الرحلة الجامعية.

سوال 3: اکتب/اكتبی رسالة إلى مدیر مكتبة تجارية لإرسال الكتب.

سوال 4: اکتب/اكتبی حكاية تحت عنوان "فكر فی الخروج قبل الدخول".



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: News Reporting & Writing

Course Code: BSCS-301

Time: 3 Hrs.

Marks: 60

Roll No. ....

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

Q.1. Answer the following short questions:

(5x6=30)

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات دیں۔

1) How can you define News?

1. آپ خبر کو کیسے بیان کر سکتے ہیں؟

2) What are news values?

2. خبری اقدار کسے کہتے ہیں؟

3) Why is a reporter important for a newspaper?

3. ایک اخبار کے لئے رپورٹر کیوں اہم ہوتا ہے؟

4) What is a byline story?

4. بانی لائن سٹوری کسے کہتے ہیں؟

5) What are the important sources of court beat?

5. عدالتی بیٹ کے اہم ذرائع کون کون سے ہیں؟

6) What is a lead story?

6. لیڈ سٹوری کسے کہتے ہیں؟

Q.2. Answer the following questions.

(3x10=30)

سوال نمبر 2: مندرجہ ذیل سوالات کے مفصل جوابات دیں۔

1. What are news determinants? Please explain at least 5 news determinants with examples.

1. خبر کا تعین کرنے والے عوامل کون سے ہیں؟ خبر کا تعین کرنے والے کم از کم 5 عوامل مثالوں کے ساتھ بیان کریں۔

2. What is the difference between primary and secondary source? In your opinion, which source is more reliable.

2. پرائمری اور سیکنڈری ذرائع میں کیا فرق ہے؟ آپ کی رائے میں کونسا ذریعہ زیادہ قابل اعتماد ہے؟

3. What is inverted pyramid? Discuss its importance in detail.

3. معکوس مخروط (مثلث) کا کیا مطلب ہے؟ اس کی اہمیت پر تفصیل سے بحث کریں۔



**UNIVERSITY OF THE PUNJAB**  
**B.S. 4 Years Program / Fifth Semester – Fall 2024**

Roll No. ....

Paper: Broadcast Journalism

Course Code: BSCS-302

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Vox-pop
- ii. Script Writing
- iii. PEMRA
- iv. Community Radio
- v. TV Talk Show
- vi. Radio News Bulletin

**Q.2. Answers the following questions.**

**(3x10=30)**

- i. What are the three phases of production? Explain in detail.
- ii. How internet can be used for broadcasting in Pakistan?
- iii. Write a detail note on the working of a radio station.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Online Journalism

Course Code: BSCS-303

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Differentiate between online journalism and traditional journalism.
2. Name some useful tips for effective web design.
3. How media converged from traditional to online?
4. What do you understand by the term cyberspace?
5. What do you know about the concept blog?
6. Define the following:
  - i. Online Story telling
  - ii. DHTML
  - iii. Domain Name

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Describe in detail the benefits and drawbacks of online advertising.
2. Do you think online journalism by facilitating an open debate over various issues has given rise to more controversies or not? Discuss.
3. Digital divide describes the disparity between those who have real access to digital and information technology and those who do not. Discuss.





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(5x6=30)**

1. Explain the concept of Gatekeeping in mass media.
2. Briefly explain the concept of Selective Exposure in communication theory
3. What is the Two-Step Flow of Communication theory?
4. Define normative theories in communication. Provide examples.
5. How does Selective Retention affect audience reception of media content?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Explore the Social Learning Theory and its application to media consumption. How do individuals learn behaviors, attitudes, and social norms through media representations? Discuss the positive and negative effects of media portrayals of violence, gender roles, and social behavior, drawing on examples from television and film
2. Critically analyze Cognitive Dissonance theory in the context of media consumption. How do individuals resolve dissonance when confronted with conflicting information in media? Discuss the implications of this theory for advertising, political communication, and media propaganda.
3. Discuss the evolution and development of Mass Communication theory. Highlight the key paradigms that have shaped the field and their impact on our understanding of media effects. Compare traditional models (e.g., Hypodermic Needle, Two-Step Flow) with newer theories in terms of their relevance in today's media landscape



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

درج ذیل اشعار کی تشریح کریں اور شاعر کا نام بھی بتائیے۔

سوال نمبر 2:

(i) جو ہم پہ گزری سو گزری مگر شب ہجراں

ہمارے اشک تری عاقبت سنوار چلے

(ii) تجھ سے قسمت میں مری صورت قفل ابجد

تھا لکھا بات کے بنتے ہی جدا ہو جانا

(iii) کچھ یادگار شہر ستم گر ہی لے چلیں

آئے ہیں اس گلی میں تو پتھر ہی لے چلیں

(iv) تجھی کو جو یاں جلوہ فرماندہ دیکھا

برابر ہے دنیا کو دیکھانہ دیکھا

(v) کتنا آساں تھا ترے ہجر میں مرنا جاناں

پھر بھی اک عمر گلی جان سے جاتے جاتے

(vi) مصیبت کا پہاڑ آخر کسی دن کٹ ہی جائے گا

مجھے سراما کر تیشے سے مرجانا نہیں آتا

(3x10=30)

درج ذیل سوالات کے جواب شعری مثالوں کی مدد سے تحریر کریں۔

سوال نمبر 2:

(i) آتش کی غزل کی خصوصیات بیان کریں۔

(ii) فیض کی شاعری رومانویت اور انقلاب کے امتزاج سے شکل پذیر ہوئی۔ اظہار خیال کریں۔

(iii) یاس یگانہ کی غزل روایت سے جڑی رہنے کے باوجود منفرد خصوصیات کی حامل ہے

اپنی رائے کا اظہار کریں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جواب تحریر کریں۔

- (الف): عادل شاہی دور کی شاعری پر مختصر نوٹ تحریر کریں۔  
(ب): علی گڑھ تحریک نے اردو مضمون نگاری پر کیا اثرات مرتب کیے؟  
(ج): سودا کی قصیدہ گوئی پر تبصرہ کریں۔  
(د): بلکھنوی شاعری کی خصوصیات ضبط تحریر میں لائیں۔  
(ه): حلقہ ارباب ذوق سے وابستہ پانچ نظم نگاروں کے نام لکھیں۔  
(و): جدید نظم کے مباحث کا مختصر جائزہ لیں۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے تفصیلی جواب تحریر کریں۔

- (الف): رومانوی افسانہ نگاروں کے افسانوں کی نمایاں خصوصیات تحریر کریں۔  
(ب): ترقی پسند افسانہ نگاروں کی کاوشوں کا تجزیہ پیش کریں۔  
(ج): غالب و مومن کے دور کی غزل گوئی پر جامع نوٹ لکھیں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جواب تحریر کریں۔

- 1- افسانے اور ڈرامے میں کیا فرق ہے، وضاحت کیجیے۔
- 2- پریم چند کے کوئی سے پانچ افسانوں کے عنوانات درج کیجیے۔
- 3- انارکلی کے اہم نسوانی کردار دلا آرام کا تعارف کروائیے۔
- 4- ممتاز مفتی کے کسی ایک افسانے پر مختصر تنقیدی نوٹ لکھیے۔
- 5- ریڈیو اور اسٹیج ڈرامے میں کیا فرق ہے، وضاحت کیجیے۔
- 6- اشفاق احمد کے افسانے من چلے کا سودا کا مرکزی خیال لکھیے۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے تفصیلی جواب تحریر کریں۔

- 1- احمد ندیم قاسمی کی افسانہ نگاری پر تفصیلی نوٹ لکھیے۔
- 2- سعادت حسن منٹو کے کسی ایک افسانے کا فکری و فنی جائزہ پیش کیجیے۔
- 3- رستم و سہراب کس کا المیہ ہے، وضاحت کیجیے۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- a) Differentiate “Application Software” and “System Software”?
- b) What is the role of “Hard Disks” in computer system and discuss its types?
- c) Differentiate “CRT Monitors” and “LCD Monitors”?
- d) Discuss three types of pointing devices?
- e) Differentiate RAM and ROM?
- f) Discuss different types of Networks (LAN, WAN, MAN)?

**Answer the following questions.**

**(3x10=30)**

**Question # 2 (Marks 10)**

Define Operating System and also describe main functions of an Operating System (Process Management, Memory management, File management, Security)

**Question # 3 (Marks 10)**

Differentiate between Scanner and Printer and also discuss its types.

**Question # 4 (Marks 10)**

Discuss five different types of Formulas and Charts in Microsoft Excel.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Urdu Dastan and Novel: Themes and Art

Course Code: BSU-301

Time: 3 Hrs.

Marks: 60

Roll No. ....

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

- i. باغ و بہار کی لسانی خوبیوں کی نشاندہی کیجیے۔
- ii. فسانہ عجائب کے کردار جان عالم کا تجزیہ پیش کیجیے۔
- iii. ابن الوقت اور حجۃ الاسلام میں ہونے والی بحثوں کا موضوعاتی جائزہ لیں۔
- iv. فسانہ آزاد کے کردار خوبی پر مختصر رائے پیش کریں۔
- v. ”فردوس بریں“ کے کردار زمر کا جائزہ پیش کریں۔
- vi. ”آخر شب کے ہم سفر“ کے پلاٹ کا جائزہ لیں۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات تفصیلی جوابات تحریر کریں۔

- i. فسانہ عجائب ایک کامیاب داستان ہے، تائید یا تردید میں دلائل فراہم کیجیے۔
- ii. باغ و بہار کی تہذیبی اہمیت مثالوں کی مدد سے واضح کریں۔
- iii. امرا و جان ادا کے کرداروں کا تجزیہ کیجیے۔



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions:**

**(6x5=30)**

- Briefly explain hardware abstraction as a function of operating system.
- What is Process Control Block (PCB) and what are its contents?
- What is the use of fork() system call? What are the reasons of its failure?
- What is a thread? What are the advantages and disadvantages of threads?
- Briefly explain contiguous and paged memory system.
- Consider a system with 36-bit logical address that supports 8KB page size. Available RAM is 4 GB. Calculate the number of bits required for p, d and f. Also calculate page table size.

**Q.2. Answer the following questions.**

**(3x10=30)**

**Question#2:**

What is waiting time, turnaround time, and throughput in process scheduling? Illustrate the execution of the following processes using Round Robin scheduling (quantum=3). Also compute Average Waiting Time (AWT).

Process	Arrival Time	Burst Time
P1	0	12
P2	1	7
P3	2	5
P4	3	8
P5	4	6

**Question#3:**

What is a semaphore? What's the difference between binary and counting semaphore? What can be achieved by initializing a semaphore with 0, 1 or n?

**Question#4:**

What is a deadlock? Compare and differentiate between deadlock avoidance and deadlock prevention strategy for handling deadlock problem. Given a total of 10 units of a resource type, and given the safe state shown below, should P2 be granted a request of 2 additional resources? Show your work.

Process	Max Need	Allocated
P0	5	2
P1	6	1
P2	6	2
P3	2	1
P4	4	1



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

1. I have encrypted with the Public Key of the Sender Which of the security features we are ensuring using RSA Encryption?
2. What are security mechanisms in Information security? Explain Pervasive and Specific Security Mechanisms.
3. Discuss and explain the Design principles of the Feistel Cipher structure.
4. Plaintext "MEET ME AT THE USUAL PLACE AT TEN RATHER THAN EIGHT OCLOCK", using 1<sup>st</sup> Keyword of "TOMATO" and the 2<sup>nd</sup> keyword "CONCISE". Apply Double Columnar Transposition.
5. We have Two IP Addresses one is Transparent and the other is in Tunneling Mode which one is closest to the VPN technique? Justify Your Answer with Arguments.
6. I have the following Plaintext "FA\$Hhhh". Can I encrypt it using Playfair Cipher? If Yes Perform Encryption. If No Justify with arguments.

**Q.2. Answer the following questions. (3x10=30)**

1. Ciphertext "RHOTNSIDTTREYEHNECIVXTPOCSIEYECCLDTERTAOHEITUEISSPSNABRPT", using Keywords of "KEYWORD" and "Secret". Decrypt using Double Columnar Transposition.
2. Describe the Inter Realm Authentication along with the Diagram and steps.
3. Current state matrix is 54 77 6F 20 4F 6E 65 20 4E 69 6E 65 20 54 77 6F and Key is 54 68 61 74 73 20 6D 79 20 4B 75 6E 67 20 46 75 Now find using AES algorithm:
  1. Write in 4\*4 matrix
  2. Perform Sub-Bytes
  3. Perform Shift Rows
  4. Perform Mix Column

Rcon Constants (Base 16)			
Round	Constant(Rcon)	Round	Constant(Rcon)
1	01 00 00 00	8	20 00 00 00
2	02 00 00 00	7	40 00 00 00
3	04 00 00 00	8	80 00 00 00
4	08 00 00 00	9	1B 00 00 00
5	10 00 00 00	10	36 00 00 00

02	03	01	01
01	02	03	01
01	01	02	03
03	01	01	02

**S-Box Lookup Table**

	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f
0	63	7C	77	7B	F2	6B	6F	C5	30	01	67	2B	FE	D7	AB	76
1	CA	82	C9	7D	FA	59	47	F0	AD	D4	A2	AF	9C	A4	72	C0
2	B7	FD	93	26	36	3F	F7	CC	34	A5	E5	F1	71	D8	31	15
3	04	C7	23	C3	18	96	05	9A	07	12	80	E2	EB	27	B2	75
4	09	83	2C	1A	1B	6E	5A	A0	52	3B	D6	B3	29	E3	2F	84
5	53	D1	00	ED	20	FC	B1	5B	6A	CB	BE	39	4A	4C	58	CF
6	D0	EF	AA	FB	43	4D	33	85	45	F9	02	7F	50	3C	9F	A8
7	51	A3	40	8F	92	9D	38	F5	BC	B6	DA	21	10	FF	F3	D2
8	CD	0C	13	EC	5F	97	44	17	C4	A7	7E	3D	64	5D	19	73
9	60	81	4F	DC	22	2A	90	88	46	EE	B8	14	DE	5E	0B	DB
a	E0	32	3A	0A	49	06	24	5C	C2	D3	AC	62	91	95	E4	79
b	E7	CB	37	6D	8D	D5	4E	A9	6C	56	F4	EA	65	7A	AE	08
c	BA	78	25	2E	1C	A6	B4	C6	E8	DD	74	1F	4B	BD	8B	8A
d	70	3E	B5	66	48	03	F6	0E	61	35	57	B9	86	C1	1D	9E
e	E1	F8	98	11	69	D9	8E	94	9B	1E	87	E9	CE	55	28	DF
f	8C	A1	89	0D	BF	E6	42	68	41	99	2D	0F	80	54	BB	16



E Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	01	03	05	0F	11	33	55	FF	1A	2E	72	96	A1	F8	13	35
1	5F	E1	3E	4B	D8	73	95	A4	F7	02	06	0A	1E	22	66	AA
2	E5	34	5C	E4	37	59	EB	26	6A	BE	D9	70	90	AB	E6	31
3	53	F5	04	0C	14	3C	44	CC	4F	D1	6B	B8	D3	6E	B2	CD
4	4C	D4	67	A9	E0	3B	4D	D7	62	A6	F1	08	18	28	78	88
5	83	9E	B9	D0	6B	BD	DC	7F	81	98	B3	CE	49	DB	76	9A
6	B5	C4	57	F9	10	30	50	F0	0B	1D	27	69	BB	D6	61	A3
7	FE	19	2B	7D	87	92	AD	EC	2F	71	93	AE	E9	20	60	A0
8	FB	16	3A	4E	D2	6D	B7	C2	5D	E7	32	56	FA	15	3F	41
9	C3	5E	E2	3D	47	C9	40	C0	5B	ED	2C	74	9C	BF	DA	75
A	9F	BA	D5	64	AC	EF	2A	7E	82	9D	BC	DF	7A	8E	89	80
B	9B	B6	C1	58	E8	23	65	AF	EA	25	6F	B1	C8	43	C5	54
C	FC	1F	21	63	A5	F4	07	09	1B	2D	77	99	B0	CB	46	CA
D	45	CF	4A	DE	79	8B	86	91	A8	E3	3E	42	C6	51	F3	0E
E	12	36	5A	EE	29	7B	8D	8C	8F	8A	85	94	A7	F2	0D	17
F	39	4B	DD	7C	84	97	A2	FD	1C	24	6C	B4	C7	52	F6	01

L Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0		C0	19	01	32	02	1A	C6	4B	C7	1B	68	33	EE	DF	03
1	64	04	E0	0E	34	8D	81	EF	4C	71	08	C8	F8	69	1C	C1
2	7D	C2	1D	B5	F9	B9	27	6A	4D	E4	A6	72	9A	C9	09	78
3	65	2F	8A	05	21	0F	E1	24	12	F0	82	45	35	93	DA	8E
4	96	8F	DB	BD	36	D0	CE	94	13	5C	D2	F1	40	46	83	38
5	66	DD	FD	30	BF	06	8B	62	B3	25	E2	98	22	88	91	10
6	7E	6E	48	C3	A3	B6	1E	42	3A	6B	28	54	FA	85	3D	BA
7	2B	79	0A	15	9B	9F	5E	CA	4E	D4	AC	E5	F3	73	A7	57
8	AF	58	A8	50	F4	EA	D6	74	4F	AE	E9	D5	E7	E6	AD	E8
9	2C	D7	75	7A	EB	16	0B	F5	59	CB	5F	B0	9C	A9	51	A0
A	7F	0C	F6	6F	17	C4	49	EC	D8	43	1F	2D	A4	76	7B	B7
B	CC	BB	3E	5A	FB	60	B1	86	3B	52	A1	6C	AA	55	29	9D
C	97	B2	87	90	61	BE	DC	FC	BC	95	CF	CD	37	3F	5B	D1
D	53	39	84	3C	41	A2	6D	47	14	2A	9E	5D	56	F2	D3	AB
E	44	11	92	D9	23	20	2E	89	B4	7C	B8	26	77	99	E3	A5
F	67	4A	ED	DE	C5	31	FE	18	0D	63	8C	80	C0	F7	70	07

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
A	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
B	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A
C	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B
D	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C
E	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D
F	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E
G	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F
H	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G
I	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H
J	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I
K	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J
L	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K
M	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L
N	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M
O	O	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N
P	P	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Q	Q	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
R	R	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
S	S	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
T	T	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
U	U	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
V	V	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
W	W	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
X	X	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Y	Y	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Z	Z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

- (i) What is Quantum mechanics? Give its significance.
- (ii) Energy of a particle moving in **1-D** box is less than the particle moving in **3-D** box, justify.
- (iii) What is orthogonality of wave function?
- (iv) Define operator, which operators are used in Quantum mechanics?
- (v) Define degeneracy, give example.
- (vi) Define specific conductance. How will you determine specific conductance of a solution?
- (vii) Differentiate between activity and concentration.
- (viii) What is fuel cell? Give its advantages.
- (ix) State Kohlrausch law.
- (x) What is the purpose of salt bridge in electrochemical cells?
- (xi) What is physical significance of Arrhenius factor A?
- (xii) Explain factors effecting rate of reaction.
- (xiii) What is order of reaction? Derive units of **3<sup>rd</sup>** order reaction.
- (xiv) What is parallel reaction? Give its examples.
- (xv) What is Ostwald's dilution law?

**Answer the following questions.**

**Q.2.(a)** Derive expression for k for third order reaction when concentrations of all reactants are same. (8)

(b) What are opposed reactions. Give examples. (2)

**Q.3.(a)** What is equivalent conductance? Discuss effect of temperature and concentration on equivalent conductance. (4)

(b) Derive a relation for Debye-Huckle law for weak electrolytes. (6)

**Q.4.(a)** Apply Schrodinger wave equation on H-atom and derive an expression for Principle quantum number. (7)

(b) What is the concept of normalization of wave function? (3)



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

- i. Draw  $N(E)$  curves for N-type and P-type semiconductors.
- ii. Discuss the  $d^2sp^3$  hybridization with one example of metal carbonyl.
- iii. What are the reactions of  $Fe(CO)_5$  with the (i) NaOH (ii)  $X_2$
- iv. Discuss the preparation of  $Ni(CO)_4$ .
- v. Calculate the EAN of  $[Fe(NO)_2(CO)_2]$
- vi. What are metal nitrosyls?
- vii. Discuss the structure of  $[Ni(CN)_4]^{-2}$  on the basis of VBT.
- viii. Calculate the CFSE for low-spin  $d^6$ - system.
- ix. Write the reaction of  $Ni(CO)_4$  with (a) Na (b)  $Br_2$
- x. Discuss the crystal field splitting in tetrahedral complexes.
- xi. What is the effect of impurity in metals and semi-conductors?
- xii. Discuss Sidgwick's theory about coordination compounds.
- xiii. Define Fermi level with example.
- xiv. How are X-rays produced and what is soft X-rays spectra?
- xv. What is the effect of temperature on intrinsic and extrinsic semiconductors?

**Answer the following questions.**

**(3x10=30)**

- Q.2. Discuss the chemistry of dicobalt octacarbonyl. Give preparation, properties and structure.
- Q.3. Explain Crystal Field Theory in detail. How  $10 Dq$  can be determined and how is it affected by various factors?
- Q.4. How do  $N(E)$  curves explain the difference in conductivity of univalent, bivalent and trivalent metals

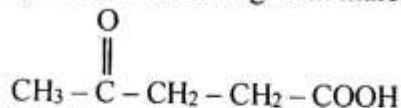


**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

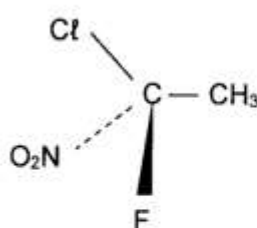
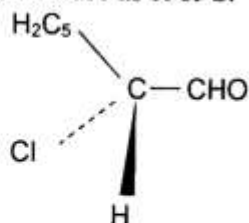
**Q.1. Answer the following short questions:**

**(15x2=30)**

- a) Synthesize following from malonic ester:



- b) Why Fluoroethanoic acid is stronger than Ethanoic acid?  
c) What is specific rotation .  
d) Compare the acidity of ethane, ethene and ethyne.?  
e) The  $(\text{CH}_3)_3\text{C}^+$  is more stable than  $(\text{CH}_3)_2\text{CH}^+$  which in turn is more stable than  $\text{CH}_3\text{CH}_2^+$  . Justify.  
f) What are pKa and pKb and relate them with the strength of base and acid.  
g) What do you mean by Meso form and Asymmetric carbon atom?  
h) Why  $\text{HCOOH}$  is stronger acid than  $\text{CH}_3\text{O}_2\text{H}$  ?  
i) Draw hybrid orbital diagram of  $\text{CH}_3\text{OH}$ .  
j) Differentiate between enantiomers and diastereomers  
k) Give structures of Conformations of cis and trans isomers of 1,2-Diethylcyclohexane.  
l) Label the following structure as R or S.



- m) Write about conformational isomerism in cyclopentane.  
n) Explain the term "Field Effect"  
o) Why  $(\text{C}_3\text{H}_7)_3\text{N}$  is weaker base than  $(\text{C}_3\text{H}_7)_2\text{NH}$  when water is used as solvent?

**Q.2. Answer the following questions.**

**(3x10=30)**

- a) Explain four methods for the resolution of a RACEMIC MIXTURE.  
b) Explain Aldol condensation reaction with conditions, mechanism and synthetic applications.  
c) Discuss the following in detail:  
(i). Conformations of *n*-Butane (ii) Stereoisomerism in biphenyl and allene



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

1. What is the molarity of 5% w/v NaOH solution?
2. What is the difference between accuracy and precision?
3. Differentiate between determinate and indeterminate errors.
4. Define null hypothesis and alternate hypothesis.
5. What is the importance of F-Test?
6. What are locating agents in chromatography?
7. Why is  $R_f$  value always less than 1?
8. What is the role of binder in TLC?
9. Give two limitations of TLC.
10. Explain one method of column packing.
11. Define absorbance and transmittance and give their relationship.
12. What are chromophores?
13. Give basic principle of UV/Visible spectroscopy.
14. What is the range of UV-Visible spectrum?
15. Which detectors are used in UV/Visible spectroscopy?

**Q.2. Answer the following questions.**

- |    |   |     |
|----|---|-----|
| 1. | a) Explain few methods of minimization of errors  | (5) |
|    | b) In the given set of data 17, 15, 23, 7, 9, 13, calculate standard deviation and variance | (5) |
| 2. | a) Explain different ways (Development techniques) to perform paper chromatography          | (5) |
|    | b) Compare TLC with Column Chromatography.  | (5) |
| 3. | a) Discuss Chemical deviations from the Beer's law.   | (5) |
|    | b) Discuss the role of wavelength Selector in UV/Visible spectrophotometer.                 | (5) |



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions: (15x2=30)**

- (i) Write down the balanced chemical equations used in the manufacturing of soda ash by Solvay's process.
- (ii) Briefly describe the method for measurement of setting of cement.
- (iii) You are provided with the following mixtures; which techniques you would use to separate the (i) Soluble solid impurities in water (ii) Organic solvent from water
- (iv) Give two industrial applications of caustic soda.
- (v) Differentiate between sludge and scale.
- (vi) Write down the balanced chemical equations for the preparation of hydrochloric acid.
- (vii) Draw a labelled diagram of diaphragm cell.
- (viii) Define pyrosulphuric acid and write down its chemical formula.
- (ix) Differentiate between evaporation and vaporization.
- (x) What are the water softeners?
- (xi) Write the two mechanical methods for removal of boiler scale.
- (xii) Write down the industrial applications of washing soda.
- (xiii) Write down the different modes of heat transfer and how they differ from each other.
- (xiv) Write down the advantage of 'wet process' over 'dry process' in the manufacturing of Portland cement.
- (xv) Write down role of gas purifier in gas purification during manufacturing of sulphuric acid.

**Answer the following questions.**

**Q No. 02 (a)** Write the balanced chemical equations that takes place in the following chambers during the manufacturing of sulfuric acid. (i) Pyrite burner (ii) Contact tower (iii) Absorption tower (iv) Dilution tank. (10)

**Q No. 03 (a)** Write down the role of the following water conditioning products and give two examples of each product (i) Phosphate dispersants (ii) Sequestering agents (iii) Oxygen scavengers (iv) Antifoaming or anti priming agents (10)

**Q No. 04 (a)** Differentiate between 'evaporation' and 'vaporization'. Briefly describe the working principle of the multiple effect evaporator. (5)

(b) Briefly describe the basic components of the distillation column and its working with the help of a diagram. (5)







**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

- I. Differentiate prokaryotes from eukaryotes.
- II. Explain the term invert sugar.
- III. Give the number of asymmetric carbon atoms in ribose by giving its structure.
- IV. Enlist two polysaccharides with structure.
- V. Justify the statement that fructose is a reducing sugar.
- VI. How denaturation of DNA occurs.
- VII. Define optical isomerism and identify two compounds which show optical activity.
- VIII. Discuss functions of smooth endoplasmic reticulum.
- IX. Define the following terms: nucleic acid, nucleotide, and nucleoside.
- X. Give any two weak interactions of biomolecules in aqueous system.
- XI. Using Henderson-Hasselbalch equation calculate the pH of acetic acid buffer solution having equal volumes each of 0.1M acetic acid and sodium acetate, whereas the pKa value is 4.8.
- XII. How the value of ionic product of water comes out to be  $10^{-14}$  M at  $25^{\circ}\text{C}$ ?
- XIII. How galactose is structurally different from glucose?
- XIV. What is the conventional way of explaining D and L configuration in carbohydrates?
- XV. Explain the term invert sugar.

**Answer the following questions.**

- Q.2. (a) Give evidences in support of cyclic structure of glucose . (5)  
(b) Give in detail the biological significance of carbohydrates . (5)
- Q.3. (a) Write note on structure of DNA . (5)  
(b) Describe the role of different types of RNA for the synthesis of protein. (5)
- Q.4 (a) How components of a cell can be isolated. (5)  
(b) How carbonic acid buffer system works in human blood. (5)





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Write short notes on the following:**

**(5x6=30)**

- A) Conceptual skill and its importance for manager.
- B) Differentiate between efficiency and effectiveness.
- C) Five key variables for creating a customer-responsive culture.
- D) Discuss Hofstede's dimensions for assessing country cultures.
- E) How does workforce diversity affect organization?

**Answer the following questions.**

**(3x10=30)**

- Q.2 Explain why controlling is important. Contrast feedforward, concurrent, and feedback control.
- Q.3 Contrast mechanistic and organic organizations. Explain the contingency factors that affect organizational design.
- Q.4 How can Maslow's Hierarchy of needs theory applied in an organization to motivate employees?



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Entrepreneurship (Commerce)

Course Code: COMM-302

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Define joint venture.
- II. What is entrepreneurship?
- III. What is competitive advantage?
- IV. Define creativity and innovation.
- V. Write down any two pricing strategies.
- VI. Enlist any five deadly mistakes of entrepreneurship

**Q.2. Answer the following questions.**

**(3x10=30)**

- I. What is business? Write down various forms of business organizations.
- II. Define entrepreneurship and also define the role of entrepreneurship in economic development of a country.
- III. What is creative thinking? How to enhance creativity and also describe various barriers in creativity process.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. How self-disclosure is a mean to gain self-awareness and also enlist any four strategies to build trust.
- II. Briefly explain the Moral Maturity Model presented by Kohlberg.
- III. Explain nonverbal communication, Paralanguage, Haptics, Proxemics, kinesics and chronemics with examples.
- IV. Briefly explain self-limiting team behaviors and the phases of team building.
- V. Is conflict normal? Briefly explain 3 theories about conflict

**Answer the following questions.**

**(3x10=30)**

- 1. Goals should be a direct reflection of your values, aspirations, and life mission.**
  - a) Describe which system is most used by managers to write/set effective goals?
  - b) How could we overcome obstacles while achieving your goals?
- 2. How do you plan your work when you have multiple conflicting tasks, does time management play any role? Draw the time management matrix.**
- 3. John Mariotti says, “You often get not what you deserve, but what you negotiate”. Considering the above maxim, delineate Strategies for Negotiating Effectively to become better professionals.**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Principles of Marketing

Course Code: COMM-304

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

1. Why is demand in the business market mostly inelastic?
2. For what types of products might marketers use market skimming pricing?
3. For what types of products might marketers use market-penetration pricing?
4. Differentiate between Shopping products and Convenience products.
5. What is Total quality management (TQM)?
6. Explain how break-even analysis can be used for target profit pricing.
7. What is a product's position" and how do marketers know what it is?
8. Explain how market variability impacts the choice of a target-marketing strategy.
9. When do marketers need marketing research?
10. Why has consumer resentment toward marketing research been growing?
11. What are the 5 brand personality traits?
12. Name or enlist the five promotion mix tools for communicating customer value.
13. How might a firm benefit from implementing an "intrapreneurial" program?
14. Why is predatory pricing considered illegal?
15. List three variables not applicable to the consumer market that may be used to segment business markets.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Who are the major players in a company's microenvironment? Explain the role each major actor plays.
2. Discuss the benefits of direct marketing to both buyers and sellers.
3. Explain the methods for setting the promotion budget and factors that affect the design of the promotion mix.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I.** Define unit of analysis.
- II.** Define variables and its types.
- III.** What is research and also discuss its types?
- IV.** Write down any three hallmarks of research.
- V.** What is null hypothesis and alternate hypothesis?
- VI.** Differentiate between problem statement and broad problem area?

**Q.2. Answer the following questions.**

**(3x10=30)**

- I.** What is sampling also write down its types and sub types in detail.
- II.** Define data collection methods and also state sources of data collection in research.
- III.** What is operationalization? And also describe that how variables are measured in research qualitatively and quantitatively.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

1. Name two historical contributors to neuroscience and their key ideas.
2. What is the main division of nervous system?
3. What is the decay theory of forgetting?
4. What is osmometric thirst?
5. Briefly explain REM sleep.
6. Name two brain mechanisms involved in hunger regulation.

**Q.2. Answer the following questions. (3x10=30)**

1. What are the types of memory, and how is long-term memory classified?
2. Describe the structure of a neuron and differentiate between the types of neurons.
3. Explain the process of auditory transduction and the pathways involved in hearing.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (15x2=30)**

1. Write main rationale of Bender Gestalt Test.
2. What does BVRT stands for and who has developed this test?
- 3 Write names of the main scoring deviations of BVRT.
- 4 Write names of the subtests of WMS.
- 5 Write names of main errors done by patients of organic brain damage on BGT.
- 6 What is the concept of ego strength in BGT?
- 7 Write names of clinical scales of MMPI
- 8 Write 2 validity checks of NEO-PI
- 9 Write two main purposes of NEO-PI.
- 10 Write three important main themes on which responses of Children Apperception Test is interpreted.
- 11 Write two phases and 4 steps involved in the interpretation of HTP.
- 12 What type of scoring is done in HTP.
- 13 What is main rationale of T.A.T.
- 14 Keeping in vie T.A.T interpretation write names of environmental forces the hero of stories face.
- 15 write about Neutral and Conflict responses of RISB.

**Q.2. Answer the following questions: (3x10=30)**

1. Write a note on the subtests of Wechsler Memory Scale.
2. Write a note on the following:
  - i. Administration method of RISB
  - ii. Depression and Hysteria Scale of MMPI-I
3. Write a note on factors of NEO-PI.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Child Psychopathology

Course Code: CPSY-314

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. State the difference between Developmental Psychopathology and Life Span Development.
2. How would you differentially diagnose between Autism Spectrum Disorder and Selective Mutism?
3. Briefly compare and contrast between DSM and ICD classification systems.
4. What are the types of Child Abuse?
5. State the diagnostic features of Intellectual Disability.
6. What are the significant developments in the field of Child Psychopathology?

**Answer the following questions:**

**(3x10=30)**

1. Explain the Etiological factors of Neurodevelopmental Disorders.
2. State the History of Abnormal Psychology.
3. Explain the Differential Diagnosis between Oppositional Defiant Disorder and Conduct Disorder.





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

1. What is the difference between Basic and Applied Research?
2. Briefly state Explanation goal of Research?
3. Briefly state any two scales of measurement?
4. What is Variable and how it is defined Operationally?
5. Briefly explain Inductive and Deductive reasoning?
6. What is Informed Consent and Debriefing in research?

**Q.2. Answer the following questions: (3x10=30)**

1. What are the types and Characteristics of a good Hypothesis, give example?
2. What are the Probability and Non Probability Sampling methods?
3. Describe both Cross Sectional and Longitudinal Survey Design with example?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

1. Mr. N is the sales manager of a shoe company. On checking his quarterly sales record, he can observe that by the month of April, a total of 83 shoes pairs were sold. What is cumulative frequency? Also identify the cumulative frequency of the given data? **(5 Marks)**

Months	No. of shoe pairs sold	Cumulative frequency
January	20	
February	30	
March	15	
April	18	
Total	83	

2. Differentiate between the assumptions of Parametric and Non parametric statistics? **(5 Marks)**

3. Marks obtained by 20 students in the Quiz are as follows: 5, 10, 20, 15, 5, 20, 20, 15, 15, 15, 10, 10, 10, 20, 15, 5, 18, 18, 18, 18. Arrange the given data in grouped frequency distribution table? **(5 Marks)**

Obtained marks	No. of students

4. Three researchers are evaluating taste preferences among three leading brands of cola. After subjects taste each brand, the first researcher simply asks each subject to identify his/her favorite. The second research asks each subject to identify the most preferred, the second most preferred and the least preferred. The third researcher asks each subject to rate each of the colas on a 10 point scale, where a rating of 1 indicates “terrible taste” and 10 indicates “excellent taste”. Identify the scale of measurement used by each researcher.

**(3 Marks)**

5. What is the mean of 2, 4, 6, 8 and 10? (2 Marks)

6. In the frequency distribution for a population of ( $N=16$ ) scores, the first Quartile is  $Q1=4.5$ , the third quartile  $Q3=8.0$ . What would be the interquartile range? (2 Marks)

7. Draw an image of sampling distribution on your answer sheet and mention/place the following concepts on that image. Also write down definitions of the following concepts?

1. Normal distribution (2 Marks)

2. Mean (2 Marks)

3. Standard deviation (SD) (2 Marks)

4. Critical region (2 Marks)

**Q.2. Answer the following questions: (3x10=30)**

1. What is effect size? Why and where is this used in statistical analysis? What is the significance of effect size?

2. What are the scales of measurement in statistics? What is their significance in statistics? Explain all with examples?

3. What are the measures of central tendency? How are they different from each other? Explain their calculations with examples?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions**

**(6x5=30)**

1. What is address mapping?
2. What are the JavaScript Html DOM elements?
3. What is java AWT text field?
4. What is a class? Write syntax of class in java.
5. Write difference between Rest and P3P.
6. What is external CSS?

**Q.2. Answer the following questions.**

**(2x15=30)**

1. What is Event listener method in JavaScript? Write a program to calculate factorial of a number in JavaScript.
2. What P3P? Write its working and example.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Give short answers to the following concepts. (5x6=30)**

- a. Explain multiple regression analysis.
- b. What is meant by level of confidence?
- c. Explain Correlation coefficient.
- d. Explain the source list in sampling.
- e. In which type of data Harmonic mean is ideal central tendency measure?

**Answer the following questions. (3x10=30)**

- Q.2. Explain different types of Non-probability sampling.**
- Q.3. How social scientists form hypothesis to check the relationship between variables.**
- Q.4. Suppose you are conducting a primary research. Which research methods and research methodology you will choose? Explain with the help of an example.**



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (6x5=30)**

- I. Find Particular Solution:  $y^{(4)}(t) + 2y^{(3)}(t) - y^{(2)}(t) + 3y'(t) - 5y = 14$
- II. Find characteristic roots:  $(r + 3)(r - 4)(r^2 + 2r + 1) = 0$
- III. Write complementary function:  $(r + 3)(r - 4)(r^2 + 2r + 1) = 0$
- IV. Find Particular Solution:  $y_{t+3} - \frac{1}{6}y_{t+2} + \frac{1}{12}y_{t+1} + \frac{1}{24}y_t = 18$
- V. Find characteristic roots:  $\left(b - \frac{3}{4}\right)\left(b - \frac{3}{4}\right)\left(b + \frac{1}{6}\right) = 0$
- VI. Write complementary function:  $\left(b - \frac{3}{4}\right)\left(b - \frac{3}{4}\right)\left(b + \frac{1}{6}\right) = 0$

**Answer the following questions. (3x10=30)**

**Q. 2. Without finding the roots of the difference equation, check the convergence of the time path:**

$$v_{t+2} + 4v_{t+1} + 4v_t = 10$$

**Q. 3. Maximize:  $\int_0^1 (5x + 3y - y^2) dt$ , subject to  $\dot{x} = 6y$ , where  $x(0) = 4$ ,  $x(1) = 34$ , using Hamiltonian Function assuming an interior solution.**

**Q. 4. Maximize profit function:  $\pi = 80x - 2x^2 + 60y - 3y^2 - 30$ , subject to production constraint  $x + y \leq 40$  by applying Kuhn-Tucker conditions.**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Advance Microeconomics

Course Code: ECON-314

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Write short notes on the following:**

**(6x5=30)**

- i. Pareto Improvement
- ii. Nash Equilibrium
- iii. Pay off Matrix
- iv. Pareto Efficiency
- v. Moral Hazard
- vi. Free Rider problem

**Q.2 Answer the following questions.**

**(3x10=30)**

1. Why does price leadership sometimes evolve in oligopolistic markets? Explain how the price leader determines a profit-maximizing price.
2. Discuss the Inefficiency of Competition with Externalities.
3. Explain the Stackelberg's model of duopoly.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Give short answers to the following concepts. (5x6=30)**

- a. Explain Internal validity
- b. Mixed data collection method
- c. Explain the source list in sampling
- d. Differentiate null and alternative hypothesis.
- e. Explain Stratified Sampling method of data collection

**Q.2. Answer the following questions. (3x10=30)**

- I. How social scientists form hypothesis to check the relationship between variables.
- II. How sampling and non-sampling errors can be reduced to get valid data for research?
- III. Choose a research problem of your own choice and in doing so follow various steps that are necessary to be considered while selecting a research problem.





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- 1) Reasons for collapse of socialism in Russia
- 2) What is New Regionalism?
- 3) Describe the economic thought of the Ancient Greeks
- 4) Describe the main ideas presented by Quesnay
- 5) Outline the core ideas of the marginalist revolution (neo-classical economics)
- 6) Discuss rational expectations revolution

**Q.2. Solve the following. (3x10=30)**

1. Analyze the New Classical school of thought with the New Keynesian school of thought by comparing the key assumptions and implications of the two schools of thought.
2. Discuss the contributions of the David Ricardo to the economic thought. Present his main theories and their implications on the development of economics.
3. Discuss the approaches used to study the subject of History of Economic thought.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

1. What is the OLS criterion of best fitted line?
2. Discuss numerical properties of OLS estimators.
3. Differentiate between multicollinearity and auto-correlation.
4. Discuss time series, cross sectional and panel data with examples.
5. Explain usage of standard error of regression estimates.
6. Explain GLS method. How it differs from OLS?

**Solve the following. (3x10=30)**

1. Define dummy variable. How one can avoid dummy trap? What are the uses of dummy variables in regression analysis?
2. An economist is trying to establish the extent of the relationship between the amount earned by a taxpayer during the year and his charitable contributions which are tax deductible. A random selection of 9 tax returns are analyzed and the results are tabulated below. The income and contributions are expressed in lakhs of rupees.

Y (Contributions)	2.0	2.5	2.7	2.5	3.8	4.2	4.3	4.4	4.45
X (Income)	25	29	32	32	40	43	50	55	57

- i. Compute values of regression coefficients and interpret estimated parameters.
  - ii. For a person earning Rs. 65 lakhs per year, how much contribution do you expect him to make?
3. Discuss hypothesis testing and the use of Z, t and F test statistics.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Development Economics-I

Course Code: ECON-321

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i Discuss nature of development economics.
- ii Write note on PQLI (Physical quality life index).
- iii Differentiate between development and growth.
- vi Explain big push theory.
- v Explain concept of dualism.
- vi. Describe the relationship between employment opportunities and educational demand.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Why is important to study development economics? Explain how Amartya Sen,s Capability approach has contributed to the understanding of development.
2. What is the Hausmann- Rodrik- Velasco growth diagnostic framework? Discuss how it helps identify binding constraints to economic growth in developing Countries.
3. Briefly explain the concept of demographic transition.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Find Particular Solution of:  $y''(t) + 3y'(t) + 2y = 4$**
- II. Find characteristic roots of:  $(r - 1)(r + 4)(r^2 - 7r + 10) = 0$**
- III. Write the complementary function of the characteristic equation  $(r - 1)(r + 4)(r^2 - 7r + 10) = 0$ .**
- IV. Find Particular Solution of:  $y_{t+2} - 8y_{t+1} + 2y_t = 10$**
- V. Find characteristic roots of:  $(b + 10) \times (b + 4) \times (b - 11) = 0$**
- VI. Write the complementary function of the characteristic equation  $(b + 10) \times (b + 4) \times (b - 11) = 0$ .**

**Answer the following questions.**

**(3x10=30)**

**Q. 2. Without finding the roots of the difference equation,  $y_{t+2} + 2.5y_{t+1} + 3y_t = 10$  check the convergence of time path.**

**Q. 3. Solve the Cobweb model, if:  $Q_{dt} = 18 - 3P_t$  and  $Q_{st} = -3 + 4P_{t-1}$ .**

**Q.4: Maximize  $[0.8x + 0.7y]$  subject to constraints:  $\begin{pmatrix} 6x + 3y \leq 2700 \\ 0.2x + 0.3y \leq 120 \\ x \geq 0 \\ y \geq 0 \end{pmatrix}$  by using linear programming.**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Instructional Technology

Course Code: ED-322

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

- i. How does micro-teaching differ from traditional teaching methods?
- ii. Discuss the advantages and limitations of using interactive analysis in education.
- iii. Explain the importance of feedback in completing the communication cycle.
- iv. How do teachers act as performers in the classroom.
- v. In what ways can learners act as generators of knowledge and contribute to peer learning?
- vi. Why is feedback considered crucial in the communication cycle?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Discuss the stages of micro-teaching and the challenges faced during its implementation.
2. Illustrate the steps of the communication cycle with examples from a classroom setting.
3. Analyze the significance of teachers acting as conductors and critics in managing classroom dynamics.



**UNIVERSITY OF THE PUNJAB**  
**B.S. 4 Years Program / Fifth Semester – Fall 2024**

Roll No. ....

Paper: Geography – III

Course Code: EDE-157

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

- i. Briefly explain Cotton Industry in South Asia.
- ii. Write a note on Import and Exports of Pakistan.
- iii. Briefly explain Iron and Steel Industry in South Asia with references distribution and trade.
- iv. Identify important Coal fields in Pakistan.
- v. Write names of Western Mountain ranges in Pakistan.
- vi. Divide the plains of Pakistan into two parts.

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. Describe in detail Geopolitical importance of Pakistan.
- ii. Write a detailed note on important Ports of South Asia.
- iii. Write a detailed note on relationship of Pakistan with India.



**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: History-III

Course Code: EDE-161

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

**Q.1. Write short answers, not more than four or five lines. (6x5=30)**

سوال نمبر 1: مختصر جوابات تحریر کیجئے۔ جوابات چار یا پانچ سطروں سے زیادہ نہ ہوں۔

- |      |                           |                       |
|------|---------------------------|-----------------------|
| i.   | 1857 War.                 |                       |
|      |                           | i۔ جنگ 1857           |
| ii.  | Partition of Bengal 1905. |                       |
|      |                           | ii۔ تقسیم بنگال 1905  |
| iii. | Separate Electorate.      |                       |
|      |                           | iii۔ جداگانہ انتخابات |
| iv.  | Delhi Proposals           |                       |
|      |                           | iv۔ تجاویز دہلی       |
| v.   | Allahabad Address         |                       |
|      |                           | v۔ خطبہ الہ آباد      |

**Q.2. Answer the following questions.**

**(2x15=30)**

سوال نمبر 2: تفصیلی جوابات تحریر کیجئے۔

- |     |  |   |
|-----|--|---|
| i.  | Write a note on the Muslim League's contribution for the Indian Muslims. |   |
|     |  | i۔ ہندوستانی مسلمانوں کے لئے مسلم لیگ کے تعاون پر نوٹ تحریر کریں۔ |
| ii. | Discuss the reaction of the Muslims to Nehru Report.                     |   |
|     |  | ii۔ نہرو رپورٹ پر مسلمانوں کے رد عمل پر بحث کریں۔                 |



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Sociology-III

Course Code: EDE-169

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Explain the major functions of sociological theory.
2. Compare the social static and social dynamic by Comte.
3. What is the role of the state in society?
4. What is the difference between an industrial and post-industrial society?
5. What is the relationship between politics and power?
6. How does the criminal justice system work?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Write an essay on Ibn-i- Khaldoon as a thinker of sociology.
2. What is conflict and how does it differ from competition?
3. What is competition? Explain its types with examples.





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات تحریر کیجئے۔

1. "قنوطیت" سے کیا مراد ہے؟
2. ادبی اصطلاح "کلاسیکیت" کا تجزیہ کیجئے۔
3. بحر مثنیٰ (سالم) کی وضاحت کیجئے اور دو شعری مثالیں بھی دیں۔
4. صنعت "تلمیح" کی وضاحت کریں اور دو شعری مثالیں بھی دیں۔
5. صنعت "ایحام" کی تعریف کریں اور تین مثالیں دیں۔
6. آفاقیت پر نوٹ تحریر کیجئے۔

(3x10=30)

سوال نمبر 2: مندرجہ ذیل سوالات کے تفصیلی جوابات تحریر کریں۔

1. اردو شاعری کے موضوعات اور اسلوب پر مغلیہ سلطنت کے زوال کے اثرات کا جائزہ پیش کریں۔
2. عینیت اور داخلیت پر نوٹ لکھیں اور مثالیں بھی دیں۔
3. مضمون بہ عنوان "اردو زبان کا آغاز و ارتقاء" تحریر کیجئے۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Islamic Studies – III

Course Code: EDE-177

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات تحریر کیجئے۔

i. Explain the importance of Ijtihad.

i. اجتہاد کی اہمیت پر نوٹ لکھیں۔

ii. Explain the importance and necessity of Sunnah in Jurisprudence.

ii. فقہ میں سنت کی اہمیت و ضرورت بیان کریں۔

iii. Briefly describe the Dawah strategy of the Prophet (PUBH)

iii. نبی ﷺ کی دعوتی حکمت عملی تحریر کریں۔

iv. What is the meant by Bai, Muztar and why was it Prohibited?

iv. بیع المظفر سے کیا مراد ہے اور اس کی ممانعت کیوں کی گئی ہے؟

v. Who will get sweetness of Faith.

v. ایمان کی حلاوت سے کیا مراد ہے؟

vi. Which three deadly (Mohlikat) things are mentioned in Hadith?

vi. حدیث میں کن تین مہلکات کا تذکرہ کیا گیا ہے؟

**Q.2. Answer the following questions.**

**(3x10=30)**

سوال نمبر 2: مندرجہ ذیل سوالات کے تفصیلی جوابات تحریر کریں۔

i. Explain the translation and interpretation of following Hadith.

عن ابی ہریرۃ قال قال رسول اللہ صلی اللہ علیہ وسلم اذا نظر احدکم الی من فضل علیہ فی المال والخلق فلینظر من وھو اسفل منہ من فضل علیہ۔

1. درج ذیل حدیث کا ترجمہ اور تشریح لکھیں۔

2. مندرجہ ذیل فقہی عبارت کا ترجمہ اور تشریح لکھیں۔

ii. Translation and interpretation of the following paragraph.

فرائض الصلوٰۃ ستۃ التحريمۃ الصيام والقراءة والركوع السجود والقدرۃ الاخرۃ مقدار الشھد وما زاد علی ذلک فھو ستۃ

3. مطالعہ سیرت النبی ﷺ کی ضرورت و اہمیت تحریر کریں؟

iii. Explain the need and importance of studying the Prophet (PUBH) Search.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Educational Assessment

Course Code: EDE-322

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

1. Differentiate between measurement and evaluation.
2. Designate Levels of Educational Objectives.
3. Describe the Importance of Classroom Tests.
4. Explain the Advantages of Objective Type Test.
5. Enlighten Item Analysis with examples.
6. Elucidate the term Usability for a Good Test.

**Q.2. Answer the following questions in detail.**

**(3x10=30)**

1. Validate the Need and Purpose of Educational Assessment.
2. Designate the Methods of Scoring of Objective Type Test and Formula for Guessing Correction.
3. Clarify the most common types of test Norms for Educational and Psychological tests.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Methods of Teaching Urdu in Elementary Schools

Course Code: EDE-372

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات تحریر کیجئے۔

- (الف) سمعی و بصری معاونات کے فائد بیان کریں۔
- (ب) طلباء میں اردو کے تلفظ کی بہتری کے لئے تجاویز دیں۔
- (ج) اصول برائے تختہ تحریر بیان کریں۔
- (د) اردو زبان کی چار خوبیاں بیان کریں۔
- (ه) بچوں میں ذخیرہ الفاظ میں اضافہ کے لئے اقدامات بیان کریں۔
- (و) اردو زبان کی تدریس بذریعہ / کہانی (تمثیل، ڈرامہ، قصہ گوئی) کی وضاحت کریں۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے مفصل جوابات تحریر کیجئے۔

- (الف) طلباء میں املاء کے مسائل کی نشاندہی کریں نیز ان کے حل کے لئے تجاویز بھی دیں۔
- (ب) سبق "قومی پرچم" برائے جماعت پنجم ایک سبقی خاکہ تیار کریں۔
- (ج) تدریس میں اردو میں آزمائشوں کی اقسام و اہمیت پر تفصیلی نوٹ لکھیں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (6x5=30)**

- i. What are the objectives of Teaching Science in elementary schools
- ii. Define the term “Learning”
- iii. Differentiate between General and Specific objectives
- iv. Explain Enquiry method of teaching
- v. Justify the objectives of Home Work?
- vi. Give the merits and demerits of Objective type tests.

**Q.2. Answer the following questions. (3x10=30)**

- i. What is the role of A.V Aid in teaching? Enlist the principles of using A.V. Aids in classroom.
- ii. Enlist the characteristics of good Lesson Plan
- iii. Give the General/professional Characteristics of good teacher.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Methods of Teaching English in Elementary Schools

Course Code: EDE-374

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions (maximum one paragraph). (6x5=30)**

- i. Describe the objectives of teaching of English at Elementary Level.
- ii. Describe types of writing with examples.
- iii. Write a note on Grammar translation method
- iv. Describe Total Physical response method of teaching
- v. Enlist the characteristics of good lesson plan.
- vi. Give suggestions to improve reading skill of students in English.

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. What is lesson planning? Give elements of lesson plan.
- ii. How English is important in everyday life in present time
- iii. Prepare a Lesson plan for class 5<sup>th</sup> Topic is "My Cycle"

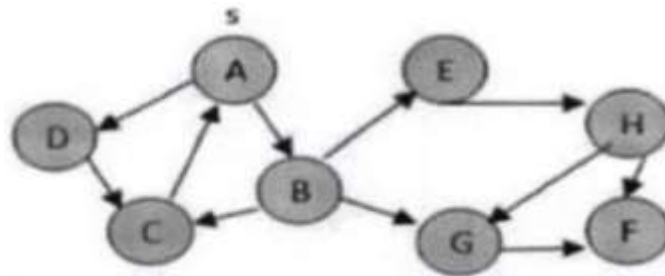


## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions.**

**(6x5=30)**

- 1) At most how many edges can be drawn in an undirected graph with  $k$  vertices in it? (No self-loops included). Describe your answer with examples.
- 2) What is a minimum spanning tree of a graph? In which case two different MSTs of the same graph may have same cost?
- 3) What is the running time of BFS if we represent its input graph by an adjacency matrix, explain briefly how you compute it?
- 4) Solve the recurrence relations to find running time complexity in terms of big Oh:
  - a)  $T(n) = 4T(n/2) + n$
  - b)  $T(n) = 5T(n/2) + n^2$
- 5) What will be the order of nodes being traversed using DFS (depth first search) if starting point is "A".

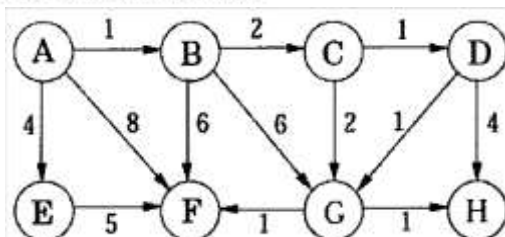


- 6) What is heap sort? What is running time complexity of heap sort?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. If an undirected graph is given, write pseudo code using DFS to find all the components from that graph. Vertices in a component are connected but not (necessarily) strongly connected.
2. Run Dijkstra's algorithm for the following graph starting with vertex "A". If you find a tie while selecting a vertex, then resolve the tie by selecting in alphabetical order. Show all steps by drawing graph at each stage to get full credit.



3. For quick sort algorithm, you need to partition the array w.r.t "Pivot". Write a C/C++ function to return pivot position of an array.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Criticism and Theory-I

Course Code: ENG-301 A

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- a. Explain Aristotle's idea of poetry.**
- b. Is Sydney apologetic about poetry?**
- c. Write a note on Arnold's idea of culture?**

**Answer the following questions. (Not more than 200-250 Words)**

**(3x15=45)**

**Q4- Comment on Philip Sidney's use of the term "Imitation" in connection with poetry.**

**Q5-Critically evaluate Words Worth's poetic theory.**

**Q6- Discuss the merits and defects of Shakespeare's as given in Johnson's "Preface to Shakespeare"?**





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (Not more than 100-150 words) (3x5=15)**

1. What are main themes/ideas in *Poetics*.
2. Write a brief note on the relationship between history and poetry in Sidney.
3. What is recognition in tragedy as theorized by Aristotle.

**Answer the following questions. (Not more than 200-250 words) (3x15=45)**

- Q.2. What is the role of the poet as theorized by William Wordsworth.
- Q.3. What is the idea of culture in Mathew Arnold? Write a detailed note.
- Q.4. Write a detailed note on the relationship between religion and literature as theorized by Eliot.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Poetry (14<sup>th</sup> to 18<sup>th</sup> Century)

Course Code: ENG-302

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- i. What is the theme and purpose of paradise lost?
- ii. Who is Frier in the prologue to Canterbury Tales?
- iii. What are the main features of Spenserian stanza in Faerie Queene?

**Q.2. Answer the following questions.**

**(3x15=45)**

- i. Discuss Milton's Grand style in Paradise Lost.
- ii. What elements of realism are in Chaucer's Prologue to Canterbury Tales?
- iii. How does Donne treat physical and spiritual love in his poetry?



**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Novel (18<sup>th</sup> & 19<sup>th</sup> Century)

Course Code: ENG-303

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (3x5=15)**

- a) Write a note on the plot structure in *Joseph Andrews*?
- b) Why is Henry Fielding called the pioneer writer in the history of English novel?
- c) Write a note on the opening chapter of *Tess of D'Urbervilles*. ?

**Q.2. Answer the following questions. (3x15=45)**

- 1. Write a detailed note on the nature of conflict in *Emma*.
- 2. Write a detailed note on important female characters in *Hard Times*.
- 3. Who is your favourite character any why in any novel of your own choice.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- a. What is the relevance of the context in any journalistic piece of writing
- b. What is the role of capitalization in journalistic piece of writing?
- c. What is co- reference in the text?

**Answer the following questions.**

**(3x15=45)**

**Q.2.** William Dalrympal's journalistic piece of writing *Blood on The Tracks brings history alive*. Discuss with appropriate textual references.

**Q.3.** Write a detailed note on **Robert Frisk's** journalistic style of writing with appropriate textual references from your understanding of his essays you have studied in your syllabus.

**Q.4** Critically analyze Eqbal Ahmed's essay **Murder of Metropolis** thematically and stylistically.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Sociolinguistics

Course Code: ENG-305

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- a) What is diglossia, and can you give an example of it?
- b) Define register in sociolinguistics and provide examples of formal and informal registers.
- c) Discuss the role of accents in communication.

**Q.2. Answer the following questions.**

**(3x15=45)**

- i) Explain how language contact can lead to new words in a language.
- ii) How does age influence language use among different generations?
- iii) What is a dialect continuum, and how does it illustrate language variation across geographical areas?



**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Visionary Discourse

Course Code: ENG-306

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

1. What is the importance of The Truce of Hudaibiya?
2. How far Quaid-e-Azam's speech on Eid-ul-Azha Oct, 24 1947 bears coherence and clarity?
3. Trace the stylistic ground in Allama Muhammad Iqbal's Khutaba Allahbad.

**Q.2. Answer the following questions.**

**(3x15=45)**

1. How does religious discourse influence our daily life.
2. How far Allama Iqbal's letters to Quaid provide an insight into his vision for the future.
3. Critically evaluate the value of Nelson Mandela's Release Speech.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(3x5=15)**

- i. What is difference between "sense" and "reference" in linguistic semantics?
- ii. "The words of a language often reflect not so much the reality of the world but the context of the people who speak it". Explain in brief.
- iii. What is difference between "prototype" and "stereotype" in meaning?

**Q.2. Answer the following questions.**

**(3x15=45)**

- i. What areas of linguistics got impact from Semantics?
- ii. Discuss the role of prototype theory in understanding the meaning of concepts. How does it differ from stereotype theory? Provide detailed examples.
- iii. What is presupposition in semantics? Discuss its types and provide examples where supposition influences sentence meaning.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Psycholinguistics

Course Code: ENG-313

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (3x5=15)**

1 :Define and Explain the theory of **Interactionism** in Language learning

2: Briefly discuss the role of **Motivation** in Language Learning.

3: What is **Sapir-Whorf Hypothesis** of Language Learning

**Q.2. Answer the following questions. (3x15=45)**

1: Explain the process of **First Language Acquisition** from 0 to 12 years

2: Discuss in Detail the major **theories of Language Learning**.

3: Discuss any three major **Factors of individual language learning**.





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Sociolinguistics

Course Code: ENG-314

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(3x5=15)**

- i. Write about **M.K.Halliday** and **Ruqiya Hasan's** (1976) definition of register.
- ii. What is Language Shift? Write about one factor of language shift.
- iii. How can a minority language be maintained?

**Answers the following questions.**

**(3x15=45)**

**Q.2. What is the scope of *Sociolinguistics* as a sub field of Linguistics in modern times. Discuss.**

**Q.3 Do men and women speak differently in different classes? Write about sex and age and how their linguistic variations affect social dialects.**

**Q.4 Write about the planning( process) of the national official language.**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Second Language Acquisition

Course Code: ENG-315

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- 1. What is the difference between Temporary Fossilization and Permanent Fossilization?**
- 2. Define Overgeneralization. What are two levels of Overgeneralization?**
- 3. How does Acculturation impact learning a new language?**

**Q.2. Answer the following questions.**

**(3x15=45)**

- 1. What is Acculturation Model proposed by John Schumann and what are the set of factors on which it is based?**
- 2. What are Five Hypotheses of Krashen's Theory of Second Language Acquisition?**
- 3. How do the Cognitive Factors affect Second Language Acquisition?**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Discourse Analysis

Course Code: ENG-316

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

1. What are FORMAL LINKS in discourse?
2. Define ELLIPSIS and provide an example.
3. What is the significance of COHERENCE in discourse?

**Q.2. Answer the following questions.**

**(3x15=45)**

1. Discuss the principles of COOPERATION and POLITENESS in conversation.
2. Explain how speech act theory relates to coherence in discourse.
3. Analyze MACRO-FUNCTIONS and their importance in discourse structure.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Analytical Study of English Literature

Course Code: ENG-321

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(3x5=15)**

1. Discuss 'repudiation of the Hereafter' as a fundamental belief of modernism.
2. Discuss the significance of setting in William Golding *Lord of the Flies*.
3. "All modernist ideologies reject transcendental values". Comment with reference to Maryam Jameelah's *Islam and Modernism*.

**Q.2. Answer the following questions:**

**(3x15=45)**

1. Discuss major thematic concerns in Hemingway's novel *The Sun also Rises*.
2. Discuss in detail the significance of symbolic elements in *Lord of the Flies*.
3. Explain the three periods of religious life in light of Allama Iqbal's lecture "Is Religion Possible?"



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: World Englishes

Course Code: ENG-322

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(3x5=15)**

- i. Explain the term Linguistic Prejudice.
- ii. How globalization is an important factor in the spread of English?
- iii. Write a note on British accents.

**Q.2. Answer the following questions.**

**(3x15=45)**

- i. What are the main features of English having become the international lingua franca?
- ii. Explain key linguistic features of South Asian Englishes.
- iii. Give some examples of linguistic features of New Englishes regarding pronunciation, grammar, vocabulary and idioms.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. What are squatter settlements, and what factors contribute to their formation in developing countries?
- ii. Explain the role of the printing press in the diffusion of languages.
- iii. Define the concept of development and outline the different ways in which it can be measured.
- iv. Discuss the relationship between population growth and food supply.
- v. Describe the distribution of major world religions and identify the regions with the highest concentrations of different religious groups.
- vi. Explain the concept of migration and discuss the push and pull factors that influence migration decisions.

**Q.2. Answer the following questions:**

**(3x10=30)**

- i. Analyze the role of language in shaping cultural identity. How do languages evolve and change over time?
- ii. Explain the concept of the demographic transition model and describe the characteristics of each of its stages.
- iii. Discuss Bernard Varenus's contributions to the development of scientific geography. How did his ideas influence the subsequent evolution of the discipline?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Discuss the "types of Glaciers."
2. Discuss the erosional landforms made by River.
3. Discuss different types of drainage patterns.
4. Discuss idealized fluvial cycle.
5. Discuss Biological Weathering.
6. Define and discuss the significance of Geomorphology.

**Answer the following questions:**

**(3x10=30)**

- 1) Discuss different types of landforms made by Karst Topography.
- 2) Discuss the GIS and RS applications in Geomorphology?
- 3) Discuss the Geomorphic processes.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

1. What is atmosphere?
2. Illustrate 'cyclone' with a labeled diagram.
3. Which are the constant gasses of atmosphere?
4. Name the meteorological instrument to measure the following:
  - I. Solar Radiation
  - II. Wind Speed
  - III. Temperature
5. Explain the Chinook winds
6. Illustrate air-pressure belts on globe with a diagram.
7. Explain the process of scattering on short waves.
8. Name the variable gasses present in the atmosphere.
9. Define the process of evaporation.
10. Differentiate between weather and climate.
11. What is meant by 'D' layer.
12. Define the fronts and name it's types.
13. Write any two characteristics of Warm air masses.
14. Write any two characteristics of Mid Altitude clouds.
15. Write any two characteristics of Anti cyclones.

**Q.2. Answer the following questions:**

**(3x10=30)**

1. Describe in detail structure and composition of atmosphere. Illustrate through diagram also.
2. Define the process of Condensation and discuss in detail, types of Clouds.
3. Discuss the Climatic Regions of Pakistan under the influence of Climatic change.





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Environmental Geography

Course Code: GEOG-304

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(10x3=30)**

1. Define the term Environmental Geography.
2. Define the term "Biotic Pyramid".
3. What is meant by the term "Regolith"?
4. Why water resources are under-stress in present times? Give three reasons.
5. Why smog pollution is increasing in Pakistan. Identify three major causes.
6. What is meant by the term "Sustainable Development"?
7. Illustrate the "Nitrogen Cycle."
8. Differentiate between Top Soil and Sub-soil.
9. Give causes of Global Warming.
10. Identify three potential impacts of "Earthquakes" in Pakistan.

**Q.2. Answer the following questions:**

**(3x10=30)**

- 1) Why is environmental geography an important branch of knowledge?
- 2) What does Climate Change mean? Briefly identify four factors responsible for the reported scale of the phenomena in present times.
- 3) What is meant by water pollution, and how Industrial water can be purified.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (15x2=30)**

- I. Define Quantitative Geography.
- II. Write a short note on Measurement Scales.
- III. Write the Problems in the Primary Data Collection.
- IV. Define the term Tabulation and also name the main parts of a Table.
- V. Differentiate between Frequency Curve and Frequency Polygon.
- VI. What is Standard Deviation?
- VII. Values of Arithmetic Mean and Standard Deviation are 43 and 4, find the Coefficient of Variation.
- VIII. Write the Components of Time Series?
- IX. What is Correlation?
- X. Differentiate between Dependent and Independent Variable.
- XI. What is meant by  $r=0$ , where  $r$  is the Coefficient of Correlation.
- XII. Define Semi Interquartile Range.
- XIII. Write the importance of Statistical Diagrams and Graphs.
- XIV. Define Median and also write its two Merits.
- XV. What is Ternary Diagram?

**Q.2. Answer the following questions: (3x10=30)**

i. Data given below shows the Temperature of different cities, find the values of Mean Temperature and Standard Deviation.

Temperature(F)	10	15	20	25	30	35	40
No. of Cities	5	12	17	15	7	3	1

ii. Find the Trend Values for the following data by using the method of Least Square.

Years	2001	2002	2003	2004	2005	2006	2007
Values	25	34	37	42	50	52	55

iii. Data given below shows the average Temperature and Rainfall of two cities in a certain year, find the Spearman's Rank Correlation Coefficient between them and also interpret the result.

Temperature °C	5	10	16	19	22	31	29	25	23	21	13	9
Rainfall (Inch)	10	17	20	21	35	29	24	30	32	27	15	8



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(10x3=30)**

1. Define "station" in the context of levelling.
2. What is the primary purpose of performing a back sight (BS)?
3. How is data validity distinct from data accuracy in geospatial analysis?
4. Describe the relationship between precision and accuracy in GPS measurements.
5. What is the function of the diaphragm in a levelling instrument's telescope?
6. Explain why cross-sectional staff readings are typically obtained during a route profile survey.
7. List three common sources of error in GPS readings.
8. What is the importance of adjusting the objective lens for parallax before taking a levelling reading?
9. Briefly outline the rise and fall method for calculating reduced levels.
10. State two applications of differential levelling in surveying.

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Explain the procedure for setting up and taking readings with a dumpy level, including the key steps and considerations for accurate measurements.
2. Discuss the two methods of calculating reduced levels – the height of instrument (HI) method and the rise and fall method. Compare their advantages and disadvantages and provide examples to illustrate their application.
3. Describe the main components of a GPS system and discuss the various sources of error that can affect GPS accuracy. Explain how these errors can be mitigated to improve the reliability of GPS measurements.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- I. Differentiate between Pure Research and Applied Research.
- II. Describe different probability sampling methods.
- III. Explain historical research?
- IV. Explain various sources from where research problems can be identified.
- V. List down steps of a Research Process
- VI. Differentiate between Open-ended and Close-ended Questionnaire.

**Q.2. Answer the following questions:**

**(3x10=30)**

- I. Discuss Survey as an approach to research in social sciences.
- II. Describe the steps of research report writing in detail.
- III. Write a detailed explanation of Probability and Non-probability Sampling.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Gender and Human Rights

Course Code: GS-302

Time: 3 Hrs.

Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

**Q.1. Answer the following short questions:**

**(5x6=30)**

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات تحریر کیجئے۔

- Write down the importance of Magna Carta in the history of human rights.  
i. انسانی حقوق کی تاریخ میں "میگنا کارٹا" کی اہمیت تحریر کریں۔
- Write the article in Universal Declaration of Human rights regarding gender equality.  
ii. انسانی حقوق کے وفاقی اعلامیہ (UDHR) میں صنفی مساوات سے متعلق آرٹیکل تحریر کریں۔
- Why there is a need of "The report system" in international Human Rights System?  
iii. بین الاقوامی انسانی حقوق کے نظام میں موجود "رپورٹ کے نظام" کی ضرورت پر مختصر آروشنی ڈالیں۔
- Write down any six Millennium development goals.  
iv. میلینیئم ڈویلپمنٹ گولز کے کوئی سے چھ اہداف تحریر کریں۔
- Explain shortly article 25(A) (Fundamental right) and its importance in the constitution of Pakistan.  
v. پاکستان کے آئین میں موجود بنیادی انسانی حق، آرٹیکل 25(A) اور اس کی اہمیت تحریر کریں۔
- Explain the following statement:  
"Women rights are human rights"  
vi. درج ذیل تحریر پر روشنی ڈالیں:  
"عورتوں کے حقوق انسانی حقوق ہیں"

**Q.2. Answer the following questions.**

**(2x15=30)**

سوال نمبر 2: درج ذیل سوالات کے تفصیلی جوابات تحریر کیجئے۔

- Write down note on any one of the following topic:  
a) International Convention on Elimination all forms of discrimination against women.  
b) Human Rights Violations and abuses.  
i. درج ذیل عنوان میں سے کسی ایک پر جامع نوٹ تحریر کریں۔  
الف) خواتین سے امتیازی سلوک کے خاتمے کا بین الاقوامی کنونشن (CEDAW)  
ب) انسانی حقوق کی پامالی
- Explain in detail the role of state and civil society in the protection of Human Right.  
ii. انسانی حقوق کے تحفظ میں ریاست اور سول سوسائٹی کے کردار پر مفصل روشنی ڈالیں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Write short note on the following.**

**(6x5=30)**

1. Water crisis
2. Alternative energy sources
3. Women as Producers
4. Women as Consumers
5. Energy crisis
6. Effects of Industrialization

**Answer the following questions.**

**(3x10=30)**

- Q.2. Urbanization is causing serious health hazards and ecological issues. Elaborate.**
- Q.3. Describe the role of gender and Intra- household dynamics and concerns of food security in Pakistan.**
- Q.4. What do you know about UN Agenda for gender Integration in Environmental Development**



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (5x6=30)**

- i. Write a brief note on women's work in developing country.
- ii. What do you understand by gendered division of labour? What is occupational segregation?
- iii. Write a short note on the difference of formal and informal women work.
- iv. What is meant by formal regulatory environment? What is gender pay gap?
- v. Write a short note on the problems of domestic women workers in Pakistan.

**Q.2. Answer the following questions. (3x10=30)**

- i. Write in details about the major theories of management and labour.
- ii. Write a comparative note on labor in capitalist and socialist economies.
- iii. What is harassment and sexual harassment? What does it have to do with hegemonic masculinity? Also write about the law about workplace harassment in Pakistan.



**UNIVERSITY OF THE PUNJAB**  
**B.S. 4 Years Program / Fifth Semester – Fall 2024**

Roll No. ....

Paper: Statistics in Social Sciences

Course Code: GS-305

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (5x6=30)**

- i. Explain the concept of "normal distribution" and its characteristics.
- ii. What distinguishes primary data from secondary data? Explain.
- iii. What is a null hypothesis? How does it differ from an alternative hypothesis?
- iv. Differentiate between the terms 'skewness' and 'kurtosis' with examples.
- v. Explain the role of standard error in statistical testing and its importance.

**Q.2. Solve the following questions: (3x10=30)**

- i. Discuss the importance and application of measures of dispersion in social sciences.
- ii. How do you interpret a scatter plot? Explain its role in understanding relationships between variables.
- iii. What is cross-tabulation? Discuss its application in analyzing social science data.





**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Gender and Politics Course Code: GS-306

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions. (6x5=30)**

1. Jirga systems and village councils
2. Liberalism
3. Radical feminism and political thought
4. Responsibilities of female legislators
5. Sources of empowerment
6. Local Government Ordinance 2000

**Q.2. Answer the following questions. (3x10=30)**

1. Highlight the challenges faced by women in politics.
2. Discuss the role of women leaders in Pakistan movement.
3. Discuss in detail the electoral system in Pakistan.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Introduction to Historiography and Philosophy of History

Course Code: HIS-301

Time: 3 Hrs. Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions.**

**(6x5=30)**

- I. Roman myth of Four Monarchies
- II. Ibn Khaldun's concept of *Asbiah*
- III. Herodotus
- IV. Scientific historiography
- V. Speculative philosophy of history
- VI. Oswald Spengler's Idea of history

**Q.2. Answer the following questions.**

**(2x15=30)**

1. Critically evaluate the contributions of Al-Tabari in the development of Islamic concept of history and Muslim historiography.
2. Write a detailed essay on Karl Marx's idea of history. Highlight how Marxist historians have influenced history writing in South Asia.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Muslim Rule in South Asia (1526-1707)

Course Code: HIS-302

Roll No. ....

Time: 3 Hrs. Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

Q.1. Give short answers to the following.

(6x5=30)

سوال نمبر: 1- مندرجہ ذیل سوالات کے مختصر جوابات تحریر کریں۔

i. Identify the reasons of Babur's success in the battle of Panipat.

i۔ بابر کی پانی پت میں کامیابی کی وجوہات کی نشاندہی کریں۔

ii. Tuzuk-Babari is an important source of History. Do you agree.

ii۔ تزک بابری تاریخ کا اہم ماخذ ہے، کیا آپ متفق ہیں۔

iii. Humayun was a weak ruler. Comment.

iii۔ ہمایوں ایک کمزور حکمران تھا۔ تبصرہ کریں۔

iv. Discuss the North West frontier policy of Emperor Akbar.

iv۔ اکبر بادشاہ کی شمالی مغربی سرحدی پالیسی پر بحث کریں۔

v. Discuss the department of justice under Jahangir.

v۔ جہانگیر کے ماتحت محکمہ انصاف پر بحث کریں۔

vi. Critically analyze the Central Asian Campaign of Shah Jahan.

vi۔ شاہ جہاں کی وسطی ایشیائی مہم کا تنقیدی جائزہ لیں۔

Answer the following questions.

(2x15=30)

مندرجہ ذیل سوالات کے جوابات تحریر کریں۔

Q. No. 2. Write a detailed note on the Akbarnama of Abul Fazal.

سوال نمبر 2۔ ابوالفضل کے اکبر نامہ پر تفصیلاً نوٹ لکھیں۔

Q. No. 3. Discuss the Deccan campaign of Aurengzeb Alamgir.

سوال نمبر 3۔ اورنگزیب عالمگیر کی دکن کی مہم پر بحث کریں۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: History of Umayyads & Abbasids (661-1258)

Course Code: HIS-303

Time: 3 Hrs. Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

Q.1. Answer the following short questions.

(6x5=30)

سوال نمبر: 1۔ مندرجہ ذیل سوالات کے مختصر جوابات تحریر کریں۔

i. Amir Muawiyah (R.A) was the real founder of Umayyads dynasty.

-i امیر معاویہؓ بنو امیہ کے حقیقی بانی تھے۔

ii. What was the military policy of Abdul Malik?

-ii عبدالملک کی مغربی پالیسی کیا تھی؟

iii. Walid-I expanded Umayyads empire. Discuss .

-iii ولید اول نے بنو امیہ کی سلطنت میں توسیع کی۔ بحث کریں۔

iv. Briefly define the achievements of Hazrat Umar bin Aziz.

-iv حضرت عمر بن عبدالعزیز کے کارناموں کا مختصر جائزہ لیں۔

v. Define the reasons of success of Abbasides Movement.

-v بنو عباس کی تحریک کی کامیابی کی وجوہات بیان کریں۔

vi. Umayyads army was the best army of at that age. Comment

-vi بنو امیہ کی فوج بہترین فوج تھی۔ تبصرہ کریں۔

Answer the following questions.

(2x15=30)

مندرجہ ذیل سوالات کے جوابات تحریر کریں۔

Q. 2. Abu Jaffar Mansoor was the real founder of Abbasides. Discuss

سوال نمبر 2۔ ابو جعفر منصور بنو عباس کے حقیقی بانی تھے۔ بحث کریں۔

Q. 3. Briefly define the literary developments of under Abbasides.

سوال نمبر 3۔ عباسیوں کے زیر اثر ادبی ترقی کا مختصر جائزہ لیں۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Science of Sports Training (Major 1)

Course Code: HPE-301

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- 1. What are the demerits of the laissez-faire coaching style?**
- 2. Discuss in detail the principle of overload in sports training.**
- 3. Write the names of different classifications of strength**
- 4. What are the merits of warm-up in sports?**
- 5. Write down five qualities of a good coach.**
- 6. Define agility, balance and power.**

**Q.2. Answer the following questions:**

**(3x10=30)**

- 1. Define speed and how can we improve the speed of an athlete, discuss in detail.**
- 2. Write down the different qualities of an effective coach in sports.**
- 3. Explain the importance of warm-up and cool-down in detail.**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Physical Education for Special Population (Elec. 1)

Course Code: HPE-302

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions:**

**(6x5=30)**

- i. Highlight the Causes of Mental and Emotional Disorders?
- ii. Define Physical Education and Special Population?
- iii. Explain the Types of Learning Disorders?
- iv. Highlight the Causes and Types of Communication Disorders?
- V. Define Individual Differences?
- Vi. Explain that How do you identify Students with Behavioural Disorders in your Class?

**Answers the following questions.**

**(3x10=30)**

**Q.2. Explain in detail the Causes, Sign and Symptoms and Types of Visual Impairments?**

**Q.3. Explain in detail the Causes, Signs and Symptoms and Types of Hearing Impairments.**

**Q.4. Explain Individual Differences Based on Personality and Body Types?**



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Sports Nutrition (Major 2)

Course Code: HPE-303

Roll No. ....

Time: 3 Hrs.

Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answers the following short questions:**

**(6x5=30)**

1. Explain the significance of sports nutrition in enhancing athletic performance.
2. Define the glycemic index and discuss its relevance to sports nutrition.
3. What is the role of lipids as an energy reserve in the body?
4. Compare basal metabolic rate (BMR) and body mass index (BMI) and their roles in nutrition planning.
5. Describe the types and importance of minerals in athletes' diets.
6. Discuss the impact of eating disorders on the mental and physical health of depressed athletes.

**Q.2. Answers the following questions.**

**(3x10=30)**

1. Please elaborate on the human energy systems and their application during different types of physical activities.
2. Analyze the effects of fuel and electrolyte losses during prolonged exercise and how to manage them effectively.
3. Explain the concept of a balanced diet and provide dietary recommendations for athletes to optimize physical performance.



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions:

(6x5=30)

1: The height (in c.m) of 30 students measured at the time of registration is given by  
91, 89, 88, 87, 89, 91, 87, 92, 90, 98, 95, 96, 100, 101, 96, 98, 99, 98, 100, 102, 99, 101, 105,  
103, 107, 105, 106, 107, 112.

Make a frequency distribution of the height of students.

2: Define mode. Write its merits and demerits.

3: A population consists of values 3, 5, 7 and 9. Take all possible samples of size 2 without replacement. Form the sampling distribution of sample mean  $\bar{X}$  and verify the results

$$(i) \mu_{\bar{X}} = \mu \quad (ii) \sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}} \sqrt{\frac{N-n}{N-1}}$$

4: Two random samples taken independently from normal population with an identical variance yield the following results

Sample	Size	Mean	Variance
I	$n_1=12$	$\bar{X}_1=10$	$s_1^2=1200$
II	$n_2=18$	$\bar{X}_2=25$	$s_2^2=900$

5 If in a certain population whose size is 10 a sample of size 4 is drawn without replacement and the following sums are obtained,  $\Sigma x=40$ ,  $\Sigma x^2=210$  then find  $\mu_x$  and  $\sigma_x$

6 Find Mean Deviation and Standard Deviation.

Classes	5 – 14	15 – 24	25 – 34	35 – 44	44 – 54
$f$	7	8	20	10	5

Q.2. Answer the following questions.

(3x10=30)

I. A random sample of 30 adults is classified according to the sex and the number of hours they watch television during a week:

Time watching	Sex	
	Male	Female
Over 25 hours	5	8
Under 25 Hours	10	7

Using  $\alpha = 0.01$  test the hypothesis that a person's sex and time watching television are independent.

II. Let  $\bar{X}_1$  represents the mean of a sample of size  $n_1 = 2$  selected at random with replacement from a finite population consisting of values 7 and 9. Similarly let  $\bar{X}_2$  represents the mean of a sample of size  $n_2 = 3$  selected at random with replacement from another finite population consisting of values 3 and 6. Form a sampling distribution of the random variable  $(\bar{X}_1 - \bar{X}_2)$  and verify that

$$(i) \mu_{\bar{X}_1 - \bar{X}_2} = \mu_1 - \mu_2 \quad (ii) \sigma_{\bar{X}_1 - \bar{X}_2}^2 = \frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}$$

III. Calculate the coefficient of quartile deviation from the given data below:

Group	25-50	50-75	75-100	100-125	125-150	150-175
Frequency	10	12	16	17	20	18





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Biochemistry (General 2)

Course Code: HPE-305

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions: (6x5=30)**

- I) Draw the structure of any two monosaccharides which has carbon 5 and carbon 6.
- II) Explain the general features and importance of monosaccharides.
- III) Differentiate between the essential and non-essential amino acids.
- IV) Differentiate between Solid and Liquid fats.
- V) Briefly explain the glycolysis.
- VI) Explain the significance of fats.

**Q.2. Answers the following questions. (3x10=30)**

- I) Explain the role of Electron Transport Chain in energy production.
- II) Briefly describe how polysaccharides like glycogen are formed, also detail the formation of glycosidic bond.
- III) Define the amino acid, draw its structure, also explain the importance of essential and non-essential amino acids in our body.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات لکھئے (6x5=30)

1. اللؤلؤ والمرجان اور فتح الباری کے مؤلفین کے نام لکھیں۔
2. حدیث جبریل علیہ السلام کی روشنی میں احسان سے کیا مراد ہے؟
3. اسلام کے بنیادی ارکان کے نام لکھیں۔
4. جہاد کے تین آداب بیان کریں۔
5. ذکر الہی کی فضیلت کے بارے میں ایک حدیث کا ترجمہ لکھیے۔
6. ترجمہ کریں۔ اَتَّقِ دَعْوَةَ الْمَظْلُومِ فَإِنَّهَا لَيَسَّ بَيْنَهَا وَبَيْنَ اللَّهِ حِجَابٌ

درج ذیل سوالات کے مفصل جوابات دیجیے۔ (3x10=30)

- سوال نمبر 2: درج ذیل حدیث کا ترجمہ اور تشریح کیجیے۔  
قَالَ النَّبِيُّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ : لَا يُؤْمِنُ أَحَدُكُمْ حَتَّىٰ أَكُونَ أَحَبَّ إِلَيْهِ مِنْ وَالِدِهِ  
وَوَلَدِهِ وَالنَّاسِ أَجْمَعِينَ
- سوال نمبر 3: ایمان کی تعریف کیجیے اور کتاب الایمان کی روشنی میں اسلام کے بنیادی عقائد پر جامع نوٹ لکھیں۔
- سوال نمبر 4: زہد سے کیا مراد ہے؟ کتاب الزہد کی روشنی میں زہد کی ضرورت و اہمیت بیان کریں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات تحریر کریں۔ (5x6=30)

1. زکوٰۃ کا معنی و مفہوم لکھیں اور تیمم کی تعریف لکھیں۔
2. حج کی اقسام بیان کریں۔
3. روزے کے دو مقاصد لکھیں۔
4. فتح القدر اور ہدایۃ الجہتد کے مصنفین کے نام لکھیں۔
5. الفقہ الاسلامی وادلتہ اور الفقہ علی المذاہب الاربعہ کے مصنفین کے نام لکھیں۔

سوال نمبر 2: درج ذیل سوالات کے مفصل جوابات تحریر کریں۔ (3x10=30)

1. طہارت کے معنی و اہمیت اور نجاست کی اقسام تفصیلاً بیان کریں۔
2. درج ذیل پر مختصر اور جامع نوٹ لکھیں۔  
1۔ نماز کی شرائط لکھیں۔ 2۔ عمرے کا طریقہ 3۔ ارکان وضوء لکھیں۔
3. عبارت کا ترجمہ و تشریح اور آئمہ کرام کی آراء ذکر کریں۔  
أَوَّلُ وَقْتِ الْمَغْرَبِ إِذَا غَرَبَتِ الشَّمْسُ وَأَخْرُوقَتِهَا مَالَم تَغْبِ الشَّفَقُ



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: مندرجہ ذیل سوالات کے مختصر جوابات لکھیے

- ۱۔ اسلامی معاشرے میں والدین کے دو حقوق اور فرائض لکھیں۔
- ۲۔ اسلامی معاشرہ میں طلاق کی کیا حیثیت ہے، اس کی اقسام لکھیں۔
- ۳۔ اسلامی معاشرہ میں ہمسایوں کے حقوق کیا ہیں۔ ان کی کیا اہمیت ہے۔
- ۴۔ اسلامی معاشرہ میں اخلاق کی کیا اہمیت ہے نیز اخلاق کی اقسام بیان کریں
- ۵۔ امت اور قوم کا کیا فرق ہے۔ امت محمدی ﷺ کی چند خصوصیات لکھیں۔
- ۶۔ اسلامی معاشرے میں استیذان کی کیا اہمیت ہے، اس کے دو آداب لکھیں۔

(3x10=30)

درج ذیل سوالات کے مفصل جوابات لکھیے

- سوال نمبر ۲۔ اسلام نے خواتین کو جو حقوق دیے ہیں، ان پر تفصیلی نوٹ لکھیں۔
- سوال نمبر ۳۔ اسلامی معاشرہ میں مسجد کی کیا اہمیت ہے۔ قرآن و سنت کی روشنی میں وضاحت کریں۔
- سوال نمبر ۴۔ اسلامی معاشرہ میں تکریم انسانیت کی کیا مراد ہے، خطبہ حجۃ الوداع میں دیے گئے حقوق انسانیت کو درج کریں۔



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

1. Write regular expression for the language that must contain exactly two  $a$ ., over input alphabets  $\Sigma = \{a, b, c\}$ . [ 5 marks]
2. Draw DFA for the language that must contain exactly that must contain exactly two  $a$ ., over input alphabets  $\Sigma = \{a, b, c\}$ . [ 5 marks]
3. Design mealy and moore machine for 1's complement. [3+3=6 marks]
4. Regular languages are closed under which operators? [ 5 marks]
5. What is pumping lemma? Where and how is it used in regular languages? [ 5 marks]
6. What is the relation between ambiguous grammar and inherently ambiguous language. [ 4 marks]

**Q.2. Answer the following questions.**

1. Write the Context Free Grammar for the language that must contain less 0 than 1 over the input alphabets  $\Sigma = \{0, 1\}$ . [6]
2. Build a Turing Machine to accept the language EVEN-EVEN-the collection of all strings with an even number of a's and an even number of b's over the input alphabets  $\Sigma = \{a, b\}$ . [7]
3. Consider the language  $L = \{a^m b^{2n} c^{3n} d^p : p > m, \text{ and } m, n \geq 1\}$ . Write a context-free grammar to generate L. Write all production rules and final grammar in this form  $G = (V, T, P, S)$  and also draw the corresponding PDA? where G, V, T, P and S stands for Grammar, Set of non-terminals, Set of terminals, and start symbol respectively. [10]
4. Write the Context Sensitive Grammar for the language  $a^{2n} b^n z^{2m} ; n \geq 2, m \geq 1$ . [7]



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (15x2=30)**

1. What is a premise?
2. What is a logical fallacy?
3. What is a syllogism?
4. What is a Logic gate ?
5. "All humans are mortal.", "Socrates is a human." What is conclusion in that statement
6. What is an inductive argument?
7. Explain truth table of Disjunction
8. What is deductive argument?
9. What is tautology
10. What is atomic statement
11. Explain Existential import
12. What is fallacy of converse
13. What is the difference between an A-type and an E-type categorical proposition?
14. What is an example of an O-type categorical proposition?
15. Which of the following pairs of propositions are **contradictories** in the Square of Opposition?  
A) All dogs are mammals (A) & Some dogs are not mammals (O)  
B) All cats are animals (A) & No cats are animals (E)  
C) Some birds are flying (I) & No birds are flying (E)  
D) All trees are green (A) & Some trees are not green (I)

**Answer the following questions. (3x10=30)**

**Q.2. Argument:**

1. **Premise 1:**  $(P \wedge Q) \rightarrow R$  (If P and Q, then R)
2. **Premise 2:**  $P$  (P is true)
3. **Conclusion:**  $\neg R$  (R is false)

**Task:**

Using a truth table, determine if the argument is **valid** or **invalid**.

**Q.3. Consider the following logical expressions:**

1. **Expression 1:**  $(P \wedge Q) \rightarrow \neg R$  (If P and Q, then not R)
2. **Expression 2:**  $\neg(P \vee Q) \vee (P \wedge Q)$

**Task:**

(a) Construct the truth tables for each of the expressions above.

(b) For **Expression 1**, identify the truth function (the logical operation that connects the components). What is the truth value of the expression when P is true, Q is true, and R is false?

(c) For **Expression 2**, determine if the expression is a **tautology**, **contradiction**, or **contingency**.

**Q.4. Explain the relationship between Turing machines and formal logic, providing detailed examples to illustrate how they are connected in computational theory.**



**Q.1. Give short answers of the following: (5x6=30)**

1. Differentiate 'process' and "process model"?
2. Differentiate "structured approach" and "object Oriented approach"?
3. Define 'architecture' with example?
4. Explain the types of 'actor'?
5. Explain three metrics of object oriented approach?

**Q.2. Give detail answers of the following: (3x10=30)**

1. Explain The "Rationale Unified Process (RUP)" with example?
2. Explain the process to make "Domain Model" by taking an example?
3. Explain the following concepts in context of "Object Oriented Analysis and Design":
  - a. Reusability
  - b. Coupling and Cohesion
  - c. Containment



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Solve the following:**

**(6x5=30)**

1. Let  $X = (x_n)$  and  $Y = (y_n)$  be sequences of real numbers that converge to  $x$  and  $y$ , respectively. Then show that the sequence  $X.Y$  converges to  $x.y$ .

2. Let  $\{S_n\}$  be a sequence defined by:

$$S_{n+1} = \sqrt{S_n + b}, \quad n \geq 1,$$

and

$$S_1 = a > b.$$

then find the limit of sequence (if exists).

3. Check the convergence or divergence of the following series with both cases, i.e., if  $\alpha > 1$  and if  $\alpha \leq 1$

$$\sum_{n=1}^{\infty} a_n = \frac{1}{n^\alpha}$$

4. Let  $I$  be a closed bounded interval and let  $f : I \rightarrow R$  be continuous on  $I$ . Then show that  $f$  is uniformly continuous on  $I$ .

5. Can we calculate the critical points of  $w = xyz$ , where  $x^2 + y^2 = 1$  &  $x - z = 0$ ? If yes, determine whether they correspond to maxima or minima.

6. Let  $f : A \rightarrow R$  and let  $c$  be a cluster point of  $A$ . If for every sequence  $(x_n)$  in  $A$  that converges to  $c$  such that  $x_n \neq c$  for all  $n \in N$ , the sequence  $(f(x_n))$  converges to  $L$ , then show that  $\lim_{x \rightarrow c} f(x) = L$ .

**Q.2. Solve the following.**

**(3x10=30)**

1. If  $f : A \rightarrow R$  and if  $c$  is a cluster point of  $A$ , then show that  $f$  can have only one limit at  $c$ .

2. Show that a bounded sequence of real numbers has a convergent subsequence.

3. Let  $I \subseteq R$  be an interval. Let  $c \in I$  and let  $f : I \rightarrow R$  and  $g : I \rightarrow R$  be functions that are differentiable at  $c$ . Then show that the function  $\frac{f}{g}$  is differentiable at  $c$  and

$$\left(\frac{f}{g}\right)'(c) = \frac{f'(c)g(c) - f(c)g'(c)}{(g(c))^2}.$$





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Group Theory-I

Course Code: MATH-302

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Solve the following questions.**

**(6x5=30)**

(i)	The union $H_1 \cup H_2$ of two subgroups $H_1, H_2$ of a group $G$ is a subgroup of $G$ if and only if either $H_1 \subseteq H_2$ or $H_2 \subseteq H_1$ .
(ii)	Prove that any group $G$ can be embedded in a group of bijective mappings of a certain set.
(iii)	Prove that any two sylow $p$ -subgroups of a group $G$ are conjugate.
(iv)	For any prime divisor $p$ of the order $n$ of a group $G$ , $G$ has a unique sylow $p$ -subgroup $H$ if and only if $H$ is normal in $G$ .
(v)	Let $G$ be a group. Then show that $G$ is Abelian if and only if $G/Z(G)$ is cyclic
(vi)	Prove that the Centre of a finite $p$ -group is non-trivial.

**Q.2. Solve the following questions.**

**(3x10=30)**

1.	If $A$ is a finite group and $p$ a prime divisor of the order of $A$ then prove that $A$ contains an element of order $p$ .
2.	Define automorphism of a group. Let $G$ be a group with $Z(G)$ as its Centre and $I(G)$ the group of Inner automorphisms. Then show that $G/Z(G) \cong I(G)$ .
3.	A finite group whose order is divisible by a prime $p$ contains a Sylow $p$ -subgroup.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Solve the following questions.**

**(6x5=30)**

- Give an example of a function that is continuous everywhere but differentiable nowhere
- Prove that harmonic conjugate of any harmonic function is not unique.
- Find all cube roots of  $\sqrt{2} + i\sqrt{2}$ .
- State Morera's theorem.
- Prove that  $\sin Z$  is unbounded.
- Consider the transformation  $w = \frac{1}{(z-2)}$ , find the image of  $|z| = 2$ .

**Q.2. Solve the following questions.**

**(4x7.5=30)**

- Construct an analytic function whose real part is  $e^{(-y)} \sin x$ .
- Let  $C$  be a straight line from  $Z = i$  to  $Z = 3 + i$ , then compute the upper bound of  $\int_C \frac{dZ}{Z^2}$ .
- State and prove Cauchy's integral formula.
- Evaluate the integral  $\int_C \frac{(\sinh^2 Z + \cos Z)}{(Z - \pi i)} dZ$ , where  $C$  is:  $|Z| = 4$

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED****Q.1. Solve the following questions:****(6x5=30)**

- i. If  $\vec{F} = (5xy - 6x^2)\hat{i} + (2y - 9x)\hat{j}$ , evaluate  $\int_C \vec{F} \cdot d\vec{r}$  along the arc  $C$  in  $xy$  plane,  $y = x^3$  from the point  $(1,1)$  to  $(2,8)$ .
- ii. State Green's theorem and Gauss divergence theorem.
- iii. Show that in orthogonal coordinates  $\nabla \cdot (A_1 \hat{e}_1) = \frac{1}{h_1 h_2 h_3} \frac{\partial}{\partial u_1} (A_1 h_2 h_3)$ .
- iv. Show that  $\frac{\partial A_p}{\partial x^2}$  is not a tensor even  $A_p$  is a covariant tensor of rank one.
- v. Transform  $\vec{A} = \frac{x}{y} \hat{i}$  into cylindrical polar coordinates.
- vi. Evaluate the Christoffel Symbol of first and second kind for the spaces where  $g_{pq} = 0$  if  $p \neq q$ .

**Solve the following questions:****(3x10=30)**

- Q. 2:** Verify Stokes theorem for  $\vec{A} = (2x - y)\hat{i} - yz^2\hat{j} - y^2z\hat{k}$  where  $S$  is the upper half surface of the sphere  $x^2 + y^2 + z^2 = 1$  and  $C$  is its boundary.
- Q. 3:** Determine the Christoffel symbol of second kind in spherical coordinates.
- Q. 4:** A covariant tensor has components  $xy, 2y - z^2, xz$  in rectangular coordinates. Find its covariant components in cylindrical coordinates.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Solve the following:**

**(6x5=30)**

- (i) Let  $X = \{a, b, c\}$  and  $\tau = \{\emptyset, \{a\}, \{b\}, \{a, b\}, X\}$ . Then find the interior, exterior, limit points, and frontier of the set  $A = \{a, c\}$ .
- (ii) Let  $X = \{a, b, c, d, e\}$  and  $\mathcal{A} = \{\{a, b, c\}, \{c, d\}, \{d, e\}\}$ . Find the topology on  $X$  generated by  $\mathcal{A}$ .
- (iii) Prove that a function  $f : X \rightarrow Y$  is continuous on  $X$  if and only if for any subset  $A$  of  $X$ ,  $f(\overline{A}) \subseteq \overline{f(A)}$ .
- (iv) Let  $X, Y$  be topological spaces. Then prove that a function  $f : X \rightarrow Y$  is continuous if and only if for each  $C$  closed in  $Y$ ,  $f^{-1}(C)$  is closed in  $X$ .
- (v) Show that every second countable space is Lindelöf space.
- (vi) Show that the continuous image of compact space is compact.

**Q.2. Solve the following.**

**(5x6=30)**

- (a) Show that topological space  $(X, \tau)$  is normal if and only if, for any closed set  $A$  and an open set  $U$  containing  $A$ , there is at least one open set  $V$  containing  $A$  such that  $A \subseteq V \subseteq \overline{V} \subseteq U$ .
- (b) Let  $X$  be a topological space, then show that for each  $x \in X$ , there is exactly one component of  $X$  containing  $x$ .
- (c) A space  $X$  is connected if and only if there does not exist a surjective continuous function  $f$  from  $X$  onto the two point discrete space.
- (d) Let  $\{A, B\}$  be a disconnection of a space  $X$  and  $C$  be a connected subspace of  $X$ . Then prove that  $C$  is contained in  $A$  or  $B$ .
- (e) Prove that every compact subset of  $R^n$  is closed and bounded.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1 Solve the following questions:**

**(5x6=30)**

- Find the equations of tangent line and normal plane to the curve represented by  $x(u) = 1 + u$ ,  $y(u) = -u^2$ ,  $z(u) = 1 + u^3$  at the point corresponding to  $u = 1$ .
- Prove that for any curve  $\mathbf{x} = \mathbf{x}(t)$ , the torsion of the curve can be expressed in the form  $\tau = \frac{[\dot{\mathbf{x}}, \ddot{\mathbf{x}}, \dddot{\mathbf{x}}]}{|\dot{\mathbf{x}} \times \ddot{\mathbf{x}}|^2}$ .
- Prove that a curve is a helix if and only if the curvature and torsion of the curve are in a constant ratio.
- For a regular parametrized curve  $\mathbf{x} = \mathbf{x}(s)$ , show that
  - $\mathbf{x}''(s) \cdot \mathbf{x}''''(s) = k(s)(\kappa''(s) - \kappa^3(s) - \kappa(s)\tau^2(s))$ ,
  - $\mathbf{x}'''(s) \cdot \mathbf{x}''''(s) = \kappa'(s)\kappa''(s) + 2\kappa^3(s)\kappa'(s) + \kappa^2(s)\tau(s)\tau'(s) + \kappa(s)\kappa'(s)\tau(s)$ .
- Show that the unit binormal of the involute  $\mathbf{x}^* = \mathbf{x} + (c - s)\mathbf{t}$  of the curve  $\mathbf{x} = \mathbf{x}(s)$  is  $\mathbf{b}^* = \frac{\kappa\mathbf{b} + \tau\mathbf{t}}{|(c-s)\kappa|}$ .

**Q.2. Solve the following questions.**

**(3x10=30)**

- What is first fundamental form  $I(\frac{du}{dt}, \frac{dv}{dt})$ ? What is this used for? Find the length of the curve  $\vartheta = \log \cot(\frac{\pi}{4} - \frac{t}{2})$ ,  $\varphi = \frac{\pi}{2} - t$ ,  $0 \leq t \leq \frac{\pi}{2}$  on the unit sphere  $x(\vartheta, \varphi) = \cos \vartheta \sin \varphi$ ,  $y(\vartheta, \varphi) = \sin \vartheta \sin \varphi$ ,  $z(\vartheta, \varphi) = \cos \varphi$  and its angle with the parametric curves.
- Define normal, principal, mean, Gaussian curvatures and lines of curvature. Find the normal curvature vector of the curve  $u = t^2, v = t$  on the surface  $x(u, v) = u + v$ ,  $y(u, v) = u - v$ ,  $z(u, v) = u^2 + v^2$  at the point  $t = 1$ . Also calculate the principal, mean and Gaussian curvatures in this case.
- Verify Gauss-Weingarten equations for the surface  $\mathbf{x} = (u, v, uv)$ .



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Persian

Course Code: PER-111

Roll No. ....

Time: 3 Hrs.

Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(3x5=15)

سوال نمبر 1: درج ذیل اقتباسات میں سے کسی تین کا اردو ترجمہ کیجئے۔

- (الف) آن دروغ وی پسندیده تر آمد، مرا، زین راست کہ تو گفتی، کہ روی آن در مصلحتی بود، و بنای این بر خبیثی. و خردمندان گفته اند: دروغی مصلحت آمیز بہ کہ راستی فتنہ انگیز.
- (ب) شنیدم کہ ملک را در آن قرب دشمنی صعب روی نمود، چون لشکر از ہر دو طرف روی در ہم آوردند، اول کسی کہ بہ میدان در آمد، این پسر بود، گفت: آن نہ من باشم کہ روز جنگ بینی پشت من.
- (ج) شبانگاہی کہ دزدان باز آمدند، سفر کردہ و غارت آوردہ، سلاح از تن بگشادند و رخت و غنیمت بنہادند. نخستین دشمنی کہ بر سر ایشان تاختن آورد، خواب بود.
- (د) ملک را خوش آمد، صرہ ای ہزار دینار از روزن برون داشت کہ دامن بدار، ای درویش. گفت: دامن از کجا آرم کہ جامہ ندارم. ملک را بر حال ضعیف او رقت زیادت شد، و خلعتی بر آن مزید کرد و پیشش فرستاد.
- (ه) بفرمود تا غلام بہ دریا انداختند. باری چند غوطہ خورد، مویش گرفتند و پیش کشتی آوردند. بہ دو دست در سکان کشتی آویخت. چون بر آمد بہ گوشہ ای بنشست و قرار یافت.

(3x5=15)

سوال نمبر 2: درج ذیل اشعار میں سے کسی تین کا اردو ترجمہ کیجئے۔

- (الف) بلبلگان در صغیر، صاصبلگان در خروش  
خون چمن گرم جوش  
ای کہ نشینی خموش  
در شکن آنین ہوش
- (ب) بازی روزگار ہا می نگریم و می رویم  
خواجہ ز سروری گذشت  
بندہ ز چاکری گذشت  
دور سکندری گذشت
- (ج) شنیدم شبی در کتب خانہ من  
بہ اوراق سینا نشیمن گرفتم  
بہ پروانہ می گفت کرم کتابی  
بسی دیدم از نسخہ فارابی
- (د) تو شب آفریدی چراغ آفریدم  
بیابان و کہسار و راغ آفریدی  
سفال آفریدی ایاغ آفریدم  
خیابان و گلزار و باغ آفریدم
- (ه) دوریم از سواد وطن باز چون رسم  
خندید و دست خویش بشمشیر برد و گفت  
ترک سبب ز روی شریعت کجا رواست  
ہر ملک ملک ماست کہ ملک خدای ماست

(15)

سوال نمبر 3: سعدی شیرازی کی نثر نویسی کا جائزہ لیجئے۔

(15)

سوال نمبر 4: علامہ اقبال کے فارسی کلام پر اظہار رائے کیجئے۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Introduction to Philosophy

Course Code: PHIL-311

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

- i. What is the difference between categorical duty and hypothetical duty?
- ii. What is meant by intentional fallacy?
- iii. Which theory of art distinguishes art from craft?
- iv. Why some theorists influenced by Karl Marx regard democracy as an illusion?
- v. Define Functionalism
- vi. What is the notion of Behaviorism?

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. What is Art? Critically evaluate idealist theory of Art.
- ii. Critically examine the Cosmological and the Ontological argument for the existence of God.
- iii. What is the difference between common-sense realism and representative realism? Elaborate.



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

#### Q.1. Answer the following short questions: (6x5=30)

1. State Kepler's Laws of planetary motion. Discuss the properties of motion in effective potential in a central force two-body problem.
2. State Hamilton's principle of least action and use it to derive the equation of motion of a one-dimensional simple harmonic oscillator.
3. Consider a cylinder rolling down an inclined plane. Write the equation of constraint. Use the method of Lagrange multiplier to write down the equation of motion.
4. An ant crawls on the surface of a ball of radius  $b$  in such a way that the ant's motion is given in spherical coordinates

$$\begin{aligned} r &= b \\ \phi &= \omega t \\ \theta &= \frac{\pi}{2} \left[ 1 + \frac{1}{4} \cos(4\omega t) \right] \end{aligned}$$

Find the speed of the ant as a function of time  $t$ .

5. What are constraints? Distinguish between holonomic and nonholonomic constraints by giving examples.
6. Find the force law for a central force field that allows a particle to move in a logarithmic spiral orbit given by

$$r = k \exp(\alpha\theta)$$

where  $k$  and  $\alpha$  are constants.

#### Q.2. Answer the following questions. (3x10=30)

1. State D' Alembert's principle and use it to derive

$$\frac{d}{dt} \left( \frac{\partial L}{\partial \dot{q}_i} \right) - \frac{\partial L}{\partial q_i} = 0.$$

2. Discuss the motion of a body of mass  $\mu$  in a central force field with the Lagrangian

$$L = \frac{1}{2} \mu (\dot{r}^2 + r^2 \dot{\theta}^2) - V(r)$$

Use the angular momentum  $l$  and total energy  $E$  (constants of motion), to derive the equation

$$\frac{d^2}{d\theta^2} \left( \frac{1}{r} \right) + \frac{1}{r} = -\frac{\mu r^2}{l^2} f \left( \frac{1}{r} \right)$$

where  $f \left( \frac{1}{r} \right)$  is the force law.

3. Define Poisson bracket of two dynamical variables. Show that the Poisson brackets obey Jacobi identity.





**Q.1. Give short answers of the following:**

**(6x5=30)**

1. Show that  $\nabla r = \hat{\mathbf{r}}$  where  $\nabla = \hat{\mathbf{i}} \frac{\partial}{\partial x} + \hat{\mathbf{j}} \frac{\partial}{\partial y} + \hat{\mathbf{k}} \frac{\partial}{\partial z}$ ,  $r = (x^2 + y^2 + z^2)^{1/2}$  and  $\mathbf{r} = x\hat{\mathbf{i}} + y\hat{\mathbf{j}} + z\hat{\mathbf{k}}$ .
2. Compute the curl of the vector-valued function  $f(r)\hat{\mathbf{r}}$ .
3. If a vector function  $\mathbf{F}$  depends on both coordinates  $(x, y, z)$  and time  $t$ , show that

$$d\mathbf{F} = (d\mathbf{r} \cdot \nabla) \mathbf{F} + \frac{\partial \mathbf{F}}{\partial t} dt.$$

4. Show that  $\mathbf{u} \times \mathbf{v}$  is solenoidal if  $\mathbf{u}$  and  $\mathbf{v}$  are each irrotational.
5. Show that  $\frac{\partial \mathbf{e}^i}{\partial u^j} = -\Gamma_{kj}^i \mathbf{e}^k$ .
6. Show whether or not the function  $f(z) = \Re(z) = x$  is analytic.

**Q.2 Answers the following questions.**

**(5x6=30)**

1. Show that the quantities  $g_{ij} = \mathbf{e}_i \cdot \mathbf{e}_j$  form the covariant components of a second-order tensor.
2. Using an indented contour and residues to show that P.V.  $\int_{-\infty}^{\infty} \frac{\sin x}{x(x^2+1)} dx = \pi(1 - e^{-1})$ .
3. Prove the expression of divergence of a vector in orthogonal curvilinear coordinates  $\nabla \cdot \mathbf{a} = \frac{1}{h_1 h_2 h_3} \left[ \frac{\partial}{\partial u_1} (h_2 h_3 a_1) + \frac{\partial}{\partial u_2} (h_1 h_3 a_2) + \frac{\partial}{\partial u_3} (h_1 h_2 a_3) \right]$ .
4. Prove that  $\nabla^2 \phi(r) = \frac{d^2 \phi(r)}{dr^2} + \frac{2}{r} \frac{d\phi(r)}{dr}$ . (Here  $\nabla^2 = \frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} + \frac{\partial^2}{\partial z^2}$ , and  $r = (x^2 + y^2 + z^2)^{1/2}$ .)
5. Expand  $f(z) = \frac{1}{(z-1)^2(z-3)}$  in a Laurent series valid for  $0 < |z-1| < 2$  and  $0 < |z-3| < 2$ .



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions: (6x5=30)**

1. Show that the kinetic energy of a two-particle system is

$$\frac{1}{2}M \dot{R}^2 + \frac{1}{2}\mu v^2$$

where  $M = m_1 + m_2$ ,  $v$  is the relative speed, and  $\frac{1}{\mu} = \frac{1}{m_1} + \frac{1}{m_2}$  (reduced mass).

2. Show that if  $f(q, p)$  and  $g(q, p)$  are any two integrals of motion of a dynamical system, their Poisson bracket is also an integral of motion.
3. A hoop of mass  $m$  and radius  $R$  rolls without slipping down an inclined plane of mass  $M$ , which makes an angle  $\alpha$  with the horizontal. Find the Lagrange's equations and integrals of motion if the plane can slide without friction along a horizontal surface.
4. Write down the Lagrangian and Hamiltonian of a plane pendulum and obtain its Hamilton's equations of motion.
5. State Hamilton's principle of least action. Derive Hamilton's equations of motion by using Hamilton's principle.
6. State and prove Kepler's second law of planetary motion (use the notion of conservation of angular momentum).

**Q.2. Answer the following questions. (3x10=30)**

1. Consider Coulomb scattering of charged particles. The Coulomb repulsive potential is  $V(r) = \frac{k}{r}$ . Start with the equation

$$\theta(r) = \int \frac{l \, dr}{r^2 \sqrt{2\mu \left( E - V - \frac{l^2}{2\mu r^2} \right)}} + \text{constant},$$

and by making suitable substitutions, derive the following expression of the impact parameter

$$b = \frac{k}{2E} \cot \left( \frac{\varphi}{2} \right)$$

where  $\varphi$  is the scattering angle and  $E$  is the total energy of the particle.

2. Show that the equation of a curve for which surface area is minimum is a catenary

$$x = a \cosh \frac{y-b}{a}$$

where  $a$  and  $b$  are constants.

3. Show that the transformation

$$\begin{aligned} P &= q \cot p, \\ Q &= \log \left( \frac{\sin p}{q} \right), \end{aligned}$$

is canonical and also show that the corresponding generating function is

$$F = e^{-Q} (1 - q^2 e^{2Q})^{\frac{1}{2}} + q \sin^{-1} (q e^Q)$$



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(15x2=30)**

- a) Define atomic packing fraction (APF) and calculate APF of FCC lattice.
- b) Draw HCP structure and show that  $c/a = 1.633$ .
- c) Define Miller indices and explain importance of Miller indices in solid state physics.
- d) Draw a planes whose Miller indices are (200) and (110).
- e) Write diffraction condition in (i) direct lattice and (ii) reciprocal lattice. Explain terms appearing in diffraction equations.
- f) What is the origin of repulsive interaction in crystals? Give one example to explain.
- g) Define the terms: (i) cohesive energy of a solid (ii) Madelung energy.
- h) What is phonon? Explain briefly the concept of quantitation of phonon wave.
- i) Explain what kind of interaction is responsible to bind crystals of inert gas atoms.
- j) Define specific heat capacity of solids and explain it in the light of Dulong-Petit law.
- k) Explain how thermal conductivity of solids depends on temperature.
- l) Calculate the lattice constant of BCC iron by taking atomic radius of iron 0.124 nm.
- m) Explain the inelastic interaction of photon with the lattice with the aid of diagram and write wave-vector selection rule for phonon creation and absorption in the process.
- n) Explain anharmonic crystal interactions.
- o) Explain briefly the term “*random stacking and polytypism*”.

**Answer the following questions.**

**Q. 2**

Establish diffraction equation in reciprocal lattice on the basis of Ewald construction. (10)

**Q. 3**

Derive an expression for cohesive energy of an inert gas crystal containing  $N$  atoms. (10)

**Q. 4**

Derive an expression for lattice heat capacity of solids on the basis of Debye model. Explain how this model fits well with the experimental observations for low temperature limit. (8+2)



Q.1. Give short answers of the following:

(6x5=30)

1. Show that  $\mathcal{F}\left\{\frac{df(x)}{dx}\right\} = (-i\omega)\mathcal{F}\{f(x)\}$ , where  $i = \sqrt{-1}$ .
2. By using the generating function  $(1 - 2xt + t^2)^{-1/2} = \sum_{n=0}^{\infty} P_n(x)t^n$  for the Legendre polynomials. Show that  $(2n + 1)xP_n(x) = (n + 1)P_{n+1}(x) + nP_{n-1}(x)$ .
3. Find the Fourier series of the function
$$f(x) = \begin{cases} \sin \omega x & 0 < \omega x < \pi, \\ -\sin \omega x & -\pi < \omega x < 0. \end{cases}$$
4. Derive the recurrence relation  $\Gamma(z + 1) = z\Gamma(z)$  by using Euler integral  $\int_0^{\infty} e^{-t} t^{z-1} dt$ .
5. By using the generating function, show that  $J_{\nu-1}(x) + J_{\nu+1}(x) = \frac{2\nu}{x} J_{\nu}(x)$ .
6. Show that the Laguerre's ODE,  $x \frac{d^2 y(x)}{dx^2} + (1 - x) \frac{dy(x)}{dx} + ny(x) = 0$ , may be put into self-adjoint form by multiplying by  $e^{-x}$  and that this gives  $w(x) = e^{-x}$  as the appropriate weighting function.

Q.2 Answers the following questions.

(5x6=30)

1. Find the eigenvalues and eigenfunctions of the Sturm-Liouville equation  $\frac{d^2 y(x)}{dx^2} + \lambda^2 y(x) = 0, 0 < x < L$  subject to boundary-conditions  $y(0) = y(L) = 0$ .
2. Prove that  $\int_0^{\pi/2} J_1(x \cos \theta) d\theta = \frac{1 - \cos x}{x}$ .
3. The motion of a body falling in a resisting medium may be described by  $m \frac{d^2 X(t)}{dt^2} + b \frac{dX(t)}{dt} = mg$ , when the retarding force is proportional to the velocity. Find  $X(t)$  for the initial-conditions  $X(0) = X'(0) = 0$  by employing Laplace transform.
4. Show that  $\int_{-\infty}^{\infty} x e^{-x^2} H_n(x) H_m(x) dx = \pi^{1/2} 2^{n-1} n! \delta_{m,n-1} + \pi^{1/2} 2^n (n+1)! \delta_{m,n+1}$ .
5. Find the Fourier transform of a Gaussian function  $f(x) = e^{-ax^2}$ , with  $a > 0$ .



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Write C++ program to print the series and also display corresponding sum for the even numbers in the range from 2022 to 2300 for three iterations
- ii. Explain with examples a) while loop b) main() and c) sqrt()
- iii. Write C++ program to calculate and print area and circumference of a circle. Take radius values from the user. Implement with arrays.
- iv. Write C++ program to calculate  $Q = p^3 - 55p^2 - 37p + 46$  and print values for Q and p. Also find average of Q values. Take p values from the user for 10 iterations.
- v. Write program to determine equivalent of n capacitors connected in series and parallel. Take capacitor values from the user.
- vi. Write program to calculate and print force value by taking inputs for mass and acceleration values from the user for 10 iterations.

**Q.2. Answer the following questions.**

**(3x10=30)**

- I. Write a C++ program to solve the differential equation  $\frac{dy}{dx} = x^3 - y$  subject to the initial condition  $y(0)=1$  and  $h=0.05$  on the interval  $[0,0.2]$ .
- II. Write a C++ program to use the Trapezoidal rule with  $n=6$  to estimate the integral  $I = \int_1^2 \frac{1}{x} dx$ .
- III. Write a C++ program to evaluate the  $\frac{dy}{dx} = x + y; y(0) = 1, [0,0.5], h = 0.1$  by Runge-Kutta method (4<sup>th</sup> order).



### THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Give short answers of the following:

(15x2=30)

- i. How does biasing influence the characteristics of a junction diode?
- ii. How a Light-Emitting Diode (LED) is different from an LCD?
- iii. Draw the circuit of the Common Emitter Amplifier, how does it work?
- iv. Describe the functioning of a bridge rectifier.
- v. How does a diode act as a switch in electronic circuits?
- vi. Draw the circuit of positive clippers.
- vii. What is a Junction Field Effect Transistor (JFET)?
- viii. What is trans-conductance ( $g_m$ ) in the context of a transistor, and how does it impact amplifier performance?
- ix. What are the two advantages of a voltage divider circuit?
- x. A 15 V Zener diode has a positive temperature coefficient of 0.065%/°C. find the Zener voltage at 60°C.
- xi. Describe the condition required for saturation of the transistor.
- xii. What are the key characteristics of Schottky diodes?
- xiii. What is the one application for a tunnel diode?
- xiv. What is a major difference in the construction of D-MOSFET and E-MOSFET?
- xv. What value must  $V_{GS}$  have to produce a cutoff in a p-channel JFET with a  $V_P = -3V$ ?

Answers the following questions.

(3x10=30)

#### Question no. 2:

- a) Discuss various FET configurations and biasing techniques, including common drain, common source, and common gate.
- b) Describe the concepts of fixed transistor bias and the four-resistor bias circuit.

#### Question no. 3:

- a) Compare the characteristics and performance of common base and common collector amplifiers.
- b) discuss the working principle of the capacitor filter, the  $\pi$ -filter and the  $\pi$ -R filter.

#### Question no. 4:

- a) Describe the applications and functioning of diode wave-shaping circuits, including clippers and clamping.
- b) What is the purpose of two-port networks? What makes two-port networks differ from one-port networks?





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Western Political Philosophy-I

Course Code: POL-301

Time: 3 Hrs.

Marks: 60

Roll No. ....

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Socrates as a philosopher
- ii. Impact of the Peloponnesian War on Plato
- iii. Plato's Theory of Ethics
- iv. Plato's views about women
- v. Aristotle's 'Politics'
- vi. Aristotle's 'Just War' Theory

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. Give an account of the beginning of political institutions in Greece.
- ii. Explain the criticism of democracy in the 'Republic' by Plato.
- iii. Explain Aristotle's Classification of Governments.





**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Muslim Political Philosophy-I

Course Code: POL-302

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions:**

**(6x5=30)**

- i. What is the Islamic concept of Sovereignty?
- ii. Write any three responsibilities of Khalifa.
- iii. Write a short note on fundamental rights of Minorities in Islam.
- iv. Describe the concept of Justice by Imam Ghazali.
- v. Write any two stages of evolution of society by Shah Wali-Ullah.
- vi. Write a short note on the concept of “Millat” by Allama Iqbal.

**Q.2. Answers the following questions.**

**(3x10=30)**

- i. Discuss in detail the significance of “Justice” in Islam.
- ii. Elaborate the importance of “Shura” in Islamic State.
- iii. Explain the concept of “Khudi” by Allama Iqbal.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(5x6=30)**

1. Define Comparative Politics.
2. Briefly explain Political Communication.
3. What are the agents of Political Socialization.
4. Briefly explain the process of Political Recruitment.
5. What is Interest Aggregation.

**Q.2. Answers the following questions.**

**(2x15=30)**

1. Highlight the features of Input/Output functions of a political system given by David Easton.
2. Define Political Culture. Critically examine the civil/military relations in the political systems of developing countries.



**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Political Ideologies

Course Code: POL-304

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Forms of democracy
  - ii. Pressure groups
  - iii. Surplus value
  - iv. Role of Political Parties
  - v. Political awareness
  - vi. State system
- 

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. "Defeat of Communism is the defeat of Marxism." Critically analyze.
- ii. Describe features of Nationalism.
- iii. Write salient features of the Caliphate.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions:**

**(6x5=30)**

1.	Define the difference between public administration and political science	پبلک ایڈمنسٹریشن اور پولیٹیکل سائنس کے درمیان فرق کی وضاحت کریں۔	1.
2.	Explain the difference between the public and private administration	پبلک اور پرائیویٹ انتظامیہ میں فرق واضح کریں۔	2.
3.	Define the public policy	عوامی پالیسی کی وضاحت کریں۔	3.
4.	Explain any two decision making models	فیصلہ سازی کے کسی بھی دو ماڈلز کی وضاحت کریں۔	4.
5.	Write the various form of communication	مواصلات کی مختلف شکلیں لکھیں۔	5.
6.	Write the characteristics of public administration	عوامی انتظامیہ کی خصوصیات لکھیں۔	6.

**Answers the following questions.**

**(3x10=30)**

Question 2 examine the importance of legislation control over public administration ?	سوال 2 عوامی انتظامیہ پر قانون سازی کے کنٹرول کی اہمیت کا جائزہ لیں؟
Question 3 what do you understand by accountability ?	سوال 3 آپ احتساب کو کیا سمجھتے ہیں؟
Question 4 why public private collaboration is important in development?	سوال 4 ترقی میں پبلک پرائیویٹ تعاون کیوں ضروری ہے؟



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Software Requirements Engineering

Course Code: SI-341

Roll No. ....

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answers the following short questions:**

**(6x5=30)**

1. Differentiate “functional requirements” and “non-functional requirements” with examples?
2. Shortly explain “requirements’ stakeholders”?
3. List the levels/layers of requirements?
4. Define and shortly explain “Requirement Traceability”?
5. Explain any one method to for “requirement management”?
6. Shortly explain “requirement engineering for agile methods”?

**Q.2. Answers the following questions.**

**(3x10=30)**

1. Explain the phase of “requirement elicitation” with examples?
2. What are the “requirement specification sources”? Explain these with examples?
3. Explain the “requirement traceability matrix” with examples?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define following with examples:**

**(5x6=30)**

1. Primary and Secondary Data Sources
2. Theory and Research
3. Simple Random and Systematic Sampling
4. Snowball and Purpose Sampling
5. Case Study Method and Content Analysis
6. Qualities of a Good Researcher

**Q.2. Answer the following questions.**

**(2x15=30)**

1. What are Tools of Data Collection? Discuss in detail different Data Collection Tools used in Qualitative and Quantitative Research.
2. Differentiate between Applied and Basic Research? Discuss the various steps involved in Research.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Social Psychology

Course Code: SOC-302

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- i. What are the major universal cultural patterns?
- ii. Define attitude in social psychology?
- iii. Define role and status?
- iv. Define morale and leadership?
- v. Define group life.
- vi. Define social behaviours.

**Answer the following questions. (3x10=30)**

**Q.2. Write a detailed note on Sigmund Freud?**

**Q.3. What is the scope and practical Significance of social psychology? Give Examples from the Pakistani society.**

**Q.4. Write a detailed note on socialization and personality development?**



**Q.1. Answer the following short questions.**

**(6x5=30)**

- A) Discuss “Why Projects Fail”?
- B) Discuss PERT Model in Project Planning?
- C) Enlist the types of Impact Assessment??
- D) Discuss Project Cycle?
- E) Discuss Project Objectives?
- F) Discuss the different strategies to deal with the project problems?

**Answers the following questions.**

**(3x10=30)**

**Q.2** Discuss the types of Impact Assessment in detail.

**Q.3** Discuss the Project Evaluation all steps in detail in process.

**Q.4** Why Plans are important in Project Management? What things need to be considered while making plans to accomplish a project? Discuss in detail





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Sociology of Globalization

Course Code: SOC-304

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Define sociology of globalization with example.
- ii. Discuss the relationship between modernization and globalization.
- iii. Discuss the world system theory.
- iv. What are the characteristics of globalization?
- v. Discuss the digital media and globalization with example.
- vi. Discuss that how technology encourages the globalization with example.

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. Discuss Globalization and discuss that how education and language connected the whole world with examples.
- ii. Discuss the global differences on gender and power relationships with examples.
- iii. Discuss that how political changes are connected throughout the globe. Explain with example.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(6x5=30)**

- a) Major tenets of structural adjustment program
- b) Democracy and development
- c) Core assumptions of Marxist theory of development
- d) World system theory
- e) Globalisation and development
- f) Differentiate between WID and GAD

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Discuss the salient features and limitation of human needs centered development approach.
2. Critically analyze the core assumptions of modernization theory of development.
3. What controversies surround the relationship between foreign aid and development?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define the following with examples:**

**(5x6=30)**

- i. Key concept of education
- ii. Role of education in social mobility
- iii. Social stratification influence on quality education
- iv. Key theoretical models used to understand dynamics
- v. Sociology of school function as an agent of social change

**Q.2. Answer the following questions.**

**(3x10=30)**

1. What are the different forms of education, including formal and non-formal, and how do they impact learning?
2. How can schools, as organizations, effectively balance educational goals with administrative management to foster a conducive learning environment?
3. How can effective manpower planning address the challenges of demand and supply in educational institutions in developing countries?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define the following with examples: (6x5=30)**

1. Define law
2. Define social legislation
3. Briefly write significance of social legislation for social workers
4. Important features in contract act 1872
5. Objective of social legislation
6. Important points in Muslim family law ordinance 1961

**Q.2. Answer the following questions. (3x10=30)**

1. Discuss in detail the sources of social legislation/
2. What do you understand by Islamic law? Write in detail its significance and resources.
3. Discuss in detail how social legislations bring social changes in any society?



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define the following with examples:**

**(6x5=30)**

1. What is the significance of international organizations in global social welfare?  
عالمی سماجی بہبود میں بین الاقوامی تنظیموں کی اہمیت کیا ہے؟
2. Define national and international organizations.  
قومی اور بین الاقوامی تنظیموں کی تعریف کریں۔
3. Enlist five challenges faced by social welfare agencies.  
سماجی بہبود کی ایجنسیوں کو درپیش پانچ چیلنجز درج کریں۔
4. Shortly describe the importance of national organizations.  
قومی تنظیموں کی اہمیت کو مختصر بیان کریں۔
5. Describe the role of a social welfare agency as a planner.  
ایک منصوبہ ساز کے طور پر سماجی بہبود کی ایجنسی کے کردار کو بیان کریں۔
6. Enlist five future directions towards national and international organizations.  
قومی اور بین الاقوامی تنظیموں کے لیے پانچ آئندہ کے اقدامات درج کریں۔

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Write a detailed note about All Pakistan Women Association (APWA).  
آل پاکستان ویمن ایسوسی ایشن پر ایک تفصیلی نوٹ لکھیں
2. Explain in detail the role of social welfare agencies in poverty alleviation.  
غربت کے خاتمے میں سماجی بہبود کی ایجنسیوں کے کردار کی تفصیل سے وضاحت کریں۔
3. Write a comprehensive note on The United Nations Children's Fund (UNICEF).  
اقوام متحدہ کے بچوں کے فنڈ پر ایک جامع نوٹ لکھیں۔



**UNIVERSITY OF THE PUNJAB**  
B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Human Rights

Course Code: SOCW-303

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define the following with examples:**

**(6x5=30)**

1. Concept of Justice in Islam
2. The code of Ethics of Human rights.
3. Universalism Human Rights.
4. Core international Instruments of Human Rights.
5. Legal Theory of Human Rights.
6. Protection of Minorities in Islam.

**Q.2. Answer the following questions.**

**(2x15=30)**

1. Describe Human Rights also discuss in detail Human Rights and politics.
2. Discuss in detail world institution and Human Rights.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Define the following with examples:**

**(6x5=30)**

1. What are the preventive functions of social group work?  
سماجی گروہی بہبود کے پیشگی بچاؤ کے افعال کیا ہیں؟
2. How is group work aligned with Islamic values and traditions?  
گروہی بہبود اسلامی اقدار اور روایات کے ساتھ کس طرح ہم آہنگ ہے؟
3. What are the main challenges in group work practice in Pakistan?  
پاکستان میں گروہی بہبود کے عمل میں اہم چیلنجز کیا ہیں؟
4. Explain the importance of evaluation in social group work.  
سماجی گروہی بہبود میں تشخیص کی اہمیت کو وضاحت سے بیان کریں۔
5. What are the techniques used in program planning for social group work?  
سماجی گروہی بہبود کے پروگرام کی منصوبہ بندی میں استعمال ہونے والی تکنیکیں کیا ہیں؟
6. What is the role of school as a social group?  
تعلیمی ادارہ (سکول) کو سماجی گروہ کے طور پر کیا کردار حاصل ہے؟

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Describe how social group work helps individuals and groups in solving problems and achieving their goals.  
سماجی گروہی بہبود افراد اور گروپوں کو مسائل حل کرنے اور اپنے مقاصد حاصل کرنے میں کس طرح مدد فراہم کرتی ہے، اس کی وضاحت کریں۔
2. Explain the principles and processes of social group work and their importance in creating effective group interventions.  
سماجی گروہی بہبود کے اصولوں اور عمل کو وضاحت سے بیان کریں اور گروہی اقدامات کو مؤثر بنانے میں ان کی اہمیت کو بیان کریں۔
3. Discuss the role and responsibilities of a social group worker and the skills needed to work effectively in different fields.  
سماجی گروہی بہبود کے کارکن کے کردار اور ذمہ داریوں پر گفتگو کریں اور مختلف شعبوں میں مؤثر طریقے سے کام کرنے کے لئے درکار مہارتوں کو بیان کریں۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Community Organization and Development

Course Code: SOCW-305

Roll No. ....

Marks: 60

## THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

Q.1. Define following with examples:

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

1. Describe Community Development as a direct method of Social Work.

1: کمیونٹی ڈویلپمنٹ کو سوشل ورک کے بنیادی طریقہ کار کے طور پر بیان کریں۔

2. Discuss sociological criteria of a good community.

2: ایک اچھی کمیونٹی کے سماجی معیار کو زیر بحث لائیں۔

3. What do you know about Community Organization?

3: کمیونٹی آرگنائزیشن کے بارے میں آپ کیا جانتے ہیں؟

4. Discuss "Gemeinschaft" and "Gesellschaft" community.

4: "جیمین شیفٹ" اور "گیزل شیفٹ" کمیونٹی کو زیر بحث لائیں۔

5. Discuss the role of Social Worker in Community Development.

5: کمیونٹی ڈویلپمنٹ میں ایک سوشل ورکر کے کردار کو زیر بحث لائیں۔

6. Highlight the salient elements of a Community.

6: ایک کمیونٹی کے چیدہ عناصر کو اجاگر کیجئے۔

Q.2. Answer the following questions.

(3x10=30)

سوال نمبر 2: درج ذیل سوالات تفصیلی جوابات تحریر کریں۔

1. Discuss in detail the process of Community Development.

1- کمیونٹی ڈویلپمنٹ کے عمل کو تفصیل سے بیان کریں۔

2. "Community Organization is a vehicle to Community Development". Please comment.

2- "کمیونٹی آرگنائزیشن کمیونٹی ڈویلپمنٹ کا ایک وسیلہ ہے"۔ برائے مہربانی تبصرہ کیجئے۔

3. Explain guiding principles of Community Development.

3- کمیونٹی ڈویلپمنٹ کے رہنما اصولوں کی وضاحت کیجئے۔





**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions.**

**(5x6=30)**

- A manufacturer of car batteries guarantees that the batteries will last, on average, 3 years with a standard deviation of 1 year. If five of these batteries have lifetimes of 1.9, 2.4, 3.0, 3.5, and 4.2 years, should the manufacturer still be convinced that the batteries have a standard deviation of 1 year at 5% level of significance?
- Clearly differentiate between one-tailed and two-tailed tests. Support your answer by giving suitable examples.
- Write complete procedure for Bartlett's test for equality of more than two variances, also give its underlying assumptions.
- Define the term sequential analysis and write general procedure of sequential test.
- The 95% confidence interval calculated for mean of a normal distribution having standard deviation 120 is (1023.3, 1101.7). Test the hypothesis that population mean is 1100 at 1% level of significance.

**Q.2. Answer the following questions.**

**(3x10=30)**

- Following table shows how many times busses were late arriving at the respective stops in 100 weeks. Test whether binomial distribution is a good fit to the data.

No. of times busses were late	0	1	2	3	4	5	6	7
No. of weeks	0	2	8	19	29	26	13	3

- A random sample of size 16 yielded mean 24.48 and variance 2.25, another sample of size 25 yielded mean 27.50 and variance 1.96. Test the hypothesis at 5% level of significance that:
  - Both samples are taken from populations having same variances.
  - Difference between two population means is more than 2.
- A shoe company wants to know if three groups of workers have different salaries (000 PKR):

Women	52, 50, 50, 51, 52, 52, 51, 52, 52,
Men	53, 50, 52, 52, 50, 49, 50, 51, 52, 50, 50, 51, 50,
Minorities	43, 42, 44, 42, 42, 42, 43, 42, 43, 42

Use Kruskal Wallis H test to analyze whether there is a significant difference in the salaries of these groups working for this company.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- I. Systematic and Randomized Design
- II. Disadvantages of CR design
- III. Treatment and Experimental Unit
- IV. Mixed Effect Models.
- V. Assumptions of ANCOVA
- VI. Advantages of Latin Square Design

**Answer the following questions: (3x10=30)**

**Q2.** A composite measure of screen quality was made on screen using four lacquer concentrations, four standing times, four acryloid concentrations (A,B,C,D) and four acetone concentrations ( $\alpha, \beta, \gamma, \delta$ ). A Greco Latin square was used for the analysis purpose and the following results were obtained. Find the relative efficiency of this design with:

- i) Latin Square Design      ii) RCB Design      iii) CR Design

Source	Columns	Rows	Latin Letters	Greek Letters	Error	Total
Sum of Squares	25.25	85.25	4.25	26.25	10.75	151.75

**Q3.** Consider the experiment in which three different machines produce a monofilament fiber for a textile company. The process engineer is interested in determining if there is a difference in the breaking strength of the fiber produced by the three machines. However, the strength of a fiber is related to its diameter, with thicker fibers being generally stronger than thinner ones. A random sample of five fiber specimens is selected from each machine. The fiber strength (y) and the corresponding diameter (x) for each specimen are shown in the following Table. Perform the Analysis of Covariance.

Machine 1		Machine 2		Machine 3	
Y	X	Y	X	Y	X
36	20	40	22	35	21
41	25	48	28	37	23
39	24	39	22	42	26
42	25	45	30	34	21
49	32	44	28	32	15

**Q4.** An experiment was conducted to investigate the blink rates during reading. Data were recorded for four successive twenty-five-minute periods of reading. Please assume that the experiment was performed on four individuals (take them as Blocks) and four periods (take them as Treatments). The data obtained during the experiment is given below:

Blocks	Treatments			
	1	2	3	4
A	124	123	128	127
B	118	-	117	119
C	141	141	149	139
D	146	169	174	-

Estimate the missing observations on 2<sup>nd</sup> row and 2<sup>nd</sup> column, 4<sup>th</sup> row and 4<sup>th</sup> column by Yates method. Analyze the data.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i) Define probability and non-probability sampling? Which of them is more preferable?
- ii) Define mean square error and its uses in sampling theory.
- iii) What is stratified sampling? What are its advantages?
- iv) Write a note on inverse sampling.
- v) What are the points to be considered while estimating the sample size?
- vi) Differentiate between linear and circular systematic sampling.

**Answer the following questions.**

**(3x10=30)**

**Q.2.** For simple random sampling, show that the sample mean,  $\bar{y}$  is an unbiased estimator of the population mean  $\bar{Y}$  and variance of sample mean is given by

$$V(\bar{y}) = \left( \frac{N-1}{Nn} \right) S^2$$

Use Cornfield approach to prove this.

**Q.3.** In stratified random sampling, show that the estimator  $\bar{y}_{st} = \sum_{h=1}^L W_h \bar{y}_h$  is an unbiased estimator of the

population mean  $\bar{Y}$  with variance given by:  $Var(\bar{y}_{st}) = \sum_{h=1}^L \frac{W_h^2 S_h^2}{n_h} (1 - f_h)$

**Q.4.** Show that the mean of a systematic sample is more precise than the mean of a simple random sample if and only if  $S_{wy}^2 > S^2$



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- a) Events A and B are such that  $P(A \cup B) = 0.75$ ,  $P(A \cap B) = 0.25$  and  $P(\bar{A}) = \frac{2}{3}$ . Find  $P(B)$ .
- b) From a pack of 52 cards, two are drawn at random. Find the probability that one is a king and the other a queen.
- c) Explain the concept of random variable. What is the distribution function and what are its properties?
- d) What are the four properties that must be present in order to use binomial distribution?
- e) Mark has 4 \$. He bet 4 times for 1\$. What is the probability that he breaks even.
- f) Differentiate between independent and mutually exclusive events. Are independent events mutually exclusive?

**Answer the following questions.**

**Q.2.** The probability that a person chosen has a certain disease is 0.03. Medical diagnostic tests are available to determine whether the person actually has the disease. If the disease is actually present, the probability that the medical diagnostic test will give a positive result is 0.90. If the disease is not actually present, the probability of a positive test result is 0.02. Suppose that the medical diagnostic test has given a positive result. What is the probability that the disease is actually present? What is the probability of a positive test result?

**(10)**

**Q.3.** Compute the mean, variance, coefficient of skewness and kurtosis of Poisson distribution.

**(10)**

**Q.4.a)** Show that the hypergeometric distribution  $h(x; N, n, k)$  can be approximated by the binomial distribution for large  $N$  and  $k$ .

- b) An insurance salesman sells policies to 5 men, all of identical age and in good health. According to the actuarial tables, the probability that a man of this particular age will be alive 30 years hence is  $\frac{2}{3}$ . Find the probability that in 30 years (i) at least 3 men, (ii) at most one man will be alive.

**(5+5)**

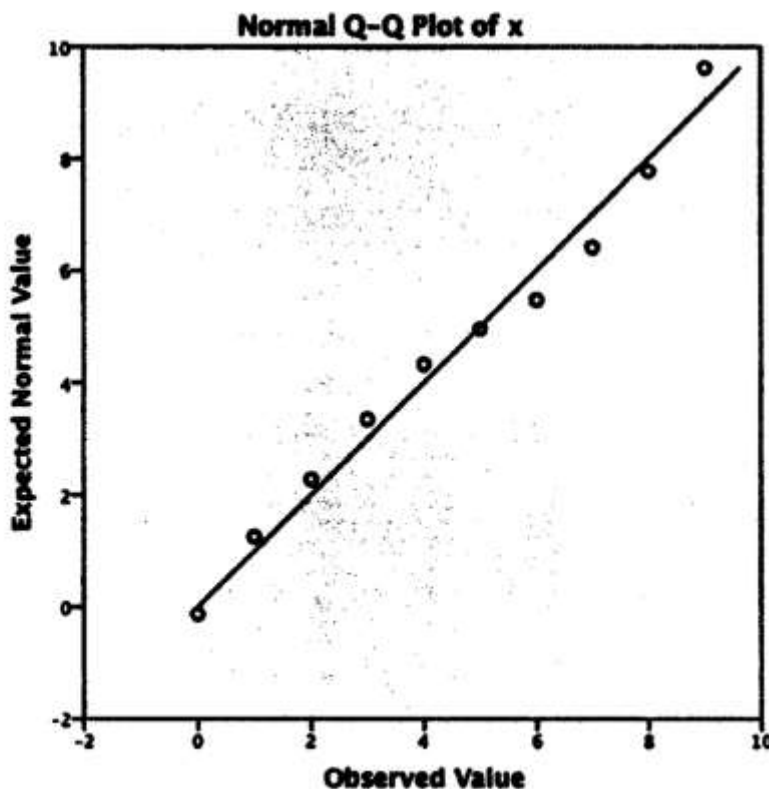


**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

Q.1. Answer the following short questions:

(6x5=30)

- i. Differentiate between categorical and quantitative variables. Describe the procedure of entering each type of variables in SPSS.
- ii. Briefly explain how the SPSS data files are split and merged?
- iii. How the date and weights variables are defined in SPSS? Give examples.
- iv. Describe the procedure of creating a time series in SPSS.
- v. How missing values are treated in SPSS? Give examples.
- vi. Interpret the plot given below.



Answers the following questions.

**Q.2:** During the spring semester 2020 a team of Statistics randomly sampled 35 university students to study grade point average (GPAs). The following table gives the data.

Grade Point Average						
2.2	3.4	4.0	3.1	3.3	3.8	3.0
2.8	2.6	3.3	3.2	3.0	2.8	3.5
3.2	3.0	2.5	2.5	2.8	3.4	2.2
2.7	2.7	2.6	2.9	3.0	2.8	2.9
2.9	2.6	3.5	2.5	2.5	2.5	3.5

Construct and interpret 90% and 95% confidence intervals for mean. Interpret the confidence intervals. Compare the lengths of the two intervals. (08)

**Q.3:** Two varieties of tomato were experimented concerning their fruit-producing abilities, measures in pounds. The following data were obtained:

Location	1	2	3	4	5	6	7	8	9	10
Variety A	3.03	3.10	2.35	3.86	3.91	1.72	2.65	2.30	2.70	3.60
Variety B	2.28	3.63	2.17	3.56	3.73	1.85	1.48	1.86	2.76	2.68

Apply (i) The sign (ii) The Wilcoxon signed-rank tests to test the hypothesis that there is no difference in fruit-producing abilities of the two varieties. Use 5% level of significance. (10)

**Q.4:** The following data were collected which are related to the length of an infant  $X_1$ (cm), age  $X_2$ (days), and weight  $X_3$ (kg). (12)

$X_1$	57.5	52.8	61.3	67.0	53.5	62.7	56.2	68.5	69.2
$X_2$	78	69	77	88	67	80	74	94	102
$X_3$	2.75	2.15	4.41	5.52	3.21	4.32	2.31	4.30	3.71

- Compute all simple correlation coefficients and interpret the results.
- Calculate all partial correlation coefficients and interpret the results.
- Fit a multiple linear regression line  $X_1$  on  $X_2$  and  $X_3$ .
- Test the overall significance of the above regression model using ANOVA table at  $\alpha = 0.05$ .



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات درکار ہیں۔

- i. باغ و بہار کی لسانی خوبیوں کی نشاندہی کیجیے۔
- ii. فسانہ عجائب کے کردار جان عالم کا تجزیہ پیش کیجیے۔
- iii. ابن الوقت اور حجت الاسلام میں ہونے والی بحثوں کا موضوعاتی جائزہ لیں۔
- iv. فسانہ آزادی خواتین کرداروں پر مختصر رائے پیش کریں۔
- v. فردوس بریں کی منظر نگاری کا جائزہ پیش کریں۔
- vi. ابن الوقت کے پلاٹ کا جائزہ لیں۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے جامع جوابات درکار ہیں۔

- i. فسانہ عجائب ایک کامیاب داستان ہے، تائید یا تردید میں دلائل فراہم کیجیے۔
- ii. باغ و بہار کی تہذیبی اہمیت مثالوں کی مدد سے واضح کریں۔
- iii. امرا و جان ادا کی فنی خصوصیات نمایاں کیجیے۔





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2023

Paper: Urdu Gazal Ka Fiqri o Funny Mutaila

Course Code: Urdu -302

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

سوال نمبر ۱۔ درج ذیل اشعار کی تشریح کریں؟ نیز شاعر کا نام بھی لکھیں۔ ہر شعر کی تشریح کے پانچ نمبر ہیں۔ (۵×۶=۳۰)

- ۱۔ حسن تھا پردہ تجرید میں سب سوں آزاد  
(۵) طالبِ عشق ہوا صورتِ انساں میں آ
- ۲۔ شکستہ پا راہ میں کھڑا ہوں، گئے دنوں کو بلا رہا ہوں  
(۵) جو قافلہ میرا ہم سفر تھا، مثالِ گردِ سفر ہو گیا وہ
- ۳۔ بتوں کو دیکھ کے سب نے خدا کو پہچانا  
(۵) خدا کے گھر تو کوئی بندہ خدا نہ گیا
- ۴۔ کوئی سنگ راہ بھی چمک اٹھا تو ستارہ سحری کہا  
(۵) میری رات بھی تیرے نام تھی اسے کس نے تیرہ شبی کہا
- ۵۔ تجھی کو جو یاں جلوہ فرما نہ دیکھا  
(۵) برابر ہے دنیا کو دیکھا نہ دیکھا
- ۶۔ سفر ہے شرطِ مسافر نواز بہتیرے  
(۵) ہزار ہا شجر سایہ دار راہ میں ہے

سوال نمبر ۲۔ درج ذیل سوالات کے تفصیلی جواب لکھیں۔ ہر سوال کے نمبر یکساں ہیں۔ (۳×۱۰=۳۰)

- ۱۔ آتش کے کلام کی خصوصیات تحریر کریں؟  
(۱۰)
- ۲۔ میر درد کے کلام میں متصوفانہ رنگ پر روشنی ڈالیں؟  
(۱۰)
- ۳۔ ناصر کاظمی کی شاعری کے فکری و فنی محاسن پر نوٹ لکھیں؟  
(۱۰)





# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Tarikh Adab Urdu aur Adbi Tehrikaay

Course Code: Urdu -303

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات درکار ہیں۔

- ۱۔ بیجاپور کے عادل شاہی دور کے چند ایک شعر کے نام تحریر کیجیے۔
- ۲۔ ملا وجہی کی تصانیف کے نام مع سنین تصنیف لکھیے۔
- ۳۔ ایہام گوئی کی تحریک کیا تھی؟ اختصار کے ساتھ وضاحت کیجیے۔
- ۴۔ دبستان لکھنؤ سے متعلق پانچ شعر کے نام تحریر کیجیے۔
- ۵۔ علی گڑھ تحریک سے وابستہ چند ایک نمایاں نثر نگاروں کے نام لکھیے۔
- ۶۔ اردو میں ترقی پسند تحریک کے بانی کون کون تھے؟ نیز اس تحریک کا پہلا جلسہ کب اور کہاں منعقد ہوا؟

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے تفصیلی جوابات درکار ہیں۔

- ۱۔ حلقہ ارباب ذوق کی ادبی خدمات پر روشنی ڈالیے۔
- ۲۔ 'میر و سودا' کے دور کو دورِ زریں کیوں کہا جاتا ہے؟ اسباب اور وجوہات کی مفصل وضاحت کیجیے۔
- ۳۔ اردو ادب میں رومانوی تحریک پر تفصیلی اظہارِ خیال کیجیے۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Urdu Fikshan May Tarikhi O Tehzibi Shaur

Course Code: Urdu-307

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

اس پرچہ کو مہیا کی گئی جوابی کاپی پر حل کریں۔

(6x5=30)

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات لکھیں۔

- ۱۔ نذیر احمد کے ناول 'توبہ النصوح' میں تہذیبی کشمکش کا تجزیہ کیجیے۔
- ۲۔ 'ذات شریف' میں کسی کردار کی تہذیبی صفات کا تعارف پیش کریں۔
- ۳۔ آخری آدمی میں آدمی بنے رہنے کی کوششوں اور ان کی ناکامی کا جائزہ لیں۔
- ۴۔ فکشن میں تاریخی شعور سے کیا مراد ہے؟ مثالوں کی مدد سے واضح کیجیے۔
- ۵۔ توبہ النصوح کے مرزا ظاہر دار بیگ کا تہذیبی تجزیہ کیجیے۔
- ۶۔ آگ کا دریا میں قدیم ہندوستانی تہذیب کا مختصر تجزیہ کیجیے۔

(3x10=30)

سوال نمبر 2: درج ذیل سوالات کے تفصیلی جوابات لکھیں۔

- ۱۔ 'خون جگر ہونے تک' میں تاریخی شعور کا جائزہ لیں۔
- ۲۔ 'ذات شریف' لکھنوی تہذیب کی بعض نمائندہ اقدار کا بیان یہ ہے، مثالوں کی مدد سے ثابت کیجیے۔
- ۳۔ پریم چند کے کسی افسانے کا تاریخی و تہذیبی شعور کے حوالے سے تجزیہ کیجیے۔



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Paper: Cell and Molecular Biology-II

Course Code: ZOOL-301

Roll No. ....

Time: 3 Hrs.

Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(5x6=30)**

- i. How does DNA replication differ between prokaryotes and eukaryotes?
- ii. What role do enhancers play in transcription?
- iii. What are Heterogeneous nuclear RNA (hnRNA)? In prokaryotes what enzymes are required for their transcription.
- iv. Why is the primary structure of DNA conserved during semi conservative replication.
- v. What is gene amplification?
- vi. Structure of Transcription factor IIIA (TFIIIA) used for 5S RNA transcription

**Q.2. Answer the following questions.**

**(3x10=30)**

- i. What are operons? How does induction and repression work in the tryptophan operon?
- ii. How is genetic engineering beneficial in the field of agriculture?
- iii. Define mutations. Give a comprehensive account of micromutations. Briefly discuss about macromutations.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Economic Zoology

Course Code: ZOOL-302 A

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Define the followings:
  - a). Endoparasites b) Commensalism c) Symbiosis (d) pediculosis (e) Dam
- ii. Write a short note on Bed bug infection, treatment and control.
- iii. Differentiate between aquaculture and fisheries?
- iv. Write down economic importance of beekeeping?
- v. Define leishmaniasis, write down its symptoms, treatment and control?
- vi. Write down classification of *Entamoeba histolytica*?

**Answer the following questions.**

**(3x10=30)**

- Q.2. Illustrate and explain the life cycle of silkworm insect.
- Q.3. Briefly discuss clinical signs, impacts, and treatment of cattle ticks.
- Q.4. Discuss culturable fish species in Pakistan, Write down their classification and economic importance.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Biochemistry-II

Course Code: ZOOL-303 A

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

- i. Concept of free energy and standard free energy change
- ii. Regulation of glycogen metabolism
- iii. Biosynthesis of Ketone bodies
- iv. Omega oxidation pathway
- v. Regulation of citric acid cycle
- vi. Metabolic fate of amino acids

**Answer the following questions.**

**(3x10=30)**

**Q. 2 Write a detailed description on electron transport chain.**

**Q. 3 Give a comprehensive note on Urea cycle.**

**Q. 4 Describe biosynthesis of pyrimidine in detail.**



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (6x5=30)**

- I. Briefly describe the hormones of posterior pituitary gland
- II. Describe in detail the sequential events of chemical synapse.
- III. Draw and describe the structure of actin and myosin filament.
- IV. Write a note on mammalian cardiac cycle.
- V. Briefly describe the aerial gas exchange system of arthropods
- VI. How does collecting duct regulate ion and water balance?

**Q.2. Answer the following questions. (3x10=30)**

1. Write a detailed note on neurotransmitters receptors with an example of acetylcholine receptors.
2. Briefly describe the structure of vertebrates striated muscle contractile apparatus and mechanism of its motility.
3. Describe in detail the variety of structures and mechanisms for gas exchange in air.



# UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fifth Semester – Fall 2024

Roll No. ....

Paper: Ecology

Course Code: ZOOL-305 A

Time: 3 Hrs. Marks: 60

**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions:**

**(6x5=30)**

1. Briefly describe the concepts of primary and secondary production.
2. Define population dynamics and its regulation.
3. Briefly explain about estuarine and wetlands with examples.
4. Differentiate between exotic and invasive species.
5. Define noise pollution also give its sources and management.
6. What are the main steps of the Sulphur cycle?

**Q.2. Answer the following questions.**

**(3x10=30)**

1. Write a detailed explanation of the nitrogen cycle?
2. Write a detailed note on the causes, effects, and possible solutions for ozone layer depletion?
3. Briefly explain the interpopulation interactions.



**THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED**

**Q.1. Answer the following short questions: (15x2=30)**

- I. Define NATURAL SELECTION.
- II. Differentiate between GENE AND GENOTYPE FREQUENCY?
- III. Define GENETIC DRIFT.
- IV. How BOTTLENECK EFFECT cause evolution?
- V. What is definition of EXTINCTION?
- VI. What is DENSITY DEPENDENT SELECTION?
- VII. How Isolation facilitates the morphological divergence in the populations?
- VIII. Why all individuals in the population are not best fit?
- IX. What is inclusive fitness?
- X. What is DARWIN Theory of Evolution?
- XI. What are conditions that trigger ADAPTIVE RADIATIONS?
- XII. How STABILIZING SELECTION cause change in gene frequency of a population?
- XIII. What is RECAPITULATION THEORY?
- XIV. Differentiate between BATESIAN and MULLERIAN MIMICRY?
- XV. How MIGRATION cause Microevolution?

**Q.2. Answer the following questions. (3x10=30)**

1. Describe factors that play role in large evolutionary changes (MACROEVOLUTION).
2. What is impact of Natural selection and Genetic drift on change of Gene frequency in a population? Discuss in detail.
3. Describe FISHER'S and ZAHAVI's theory OF SEXUAL SELECTION in detail.