UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Research Methods-II **Course Code: APSY-361** **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 strengths and limitations of Case Study method.
2. Explain the Methodological issues in experimental research design.
3. Briefly discuss Focus Group in Qualitative Research Design.
4. Write a short note on Twin and Adoption Studies
5. Discuss the advantages and limitations of Survey research method.
6. Briefly discuss Alternative Independent group design.

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

1. Describe the types of Qusai Experimental design.
2. What is Qualitative research? Explain the importance of Ethnographic research in Qualitative research
3. Discuss the different kinds of Survey research design in detail.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Theories of Personality (Revised) **Course Code: APSY-363** **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 individual psychology.
2. Shortly describe identity crises proposed by Erikson.
3. Describe Roger's notion of self-concept.
4. What is the Aron Beck contribution to psychology?
5. What are the strengths and weaknesses of the humanistic perspective?
6. Briefly explain dispositional trait theory.

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

1. Explain in detail Freud's theory of personality development.
2. Write a detailed note on some trait theories of personality in psychology.
3. Shed some light on psychoanalytic perspective.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Biological Basis of Behavior **Course Code: APSY-364** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions:

1. Elaborate shortly neural transmission and communication system. (2+2)
2. Which brain regions are involved in speech? (2)
3. How hormones effect human behavior? (2)
4. Narrate functions of Serotonin and GABA. (2+2)
5. Briefly explain the etiology and treatment of Major Depressive Disorder. (4)
6. Write names of various types of sleep. (2)
7. Briefly describe the motive of aggression. (4)
8. Write a short note on circadian rhythms? (4)
9. Describe some neurological disorders. (4)

Q.2. Answer the following questions.

1. Draw a structure of central nervous system and provide some details about it.
2. Write a detail note on some neurological assessments techniques for mental disorders.
3. What is gland system and describe some types of endocrine glands.

UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Sixth Semester – Fall 2023

Roll No. ……

Paper: Social Psychology (Revised) **Course Code: APSY-367** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

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

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Health Psychology **Course Code: APSY-368** **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 Bio-psychosocial model of health psychology.
2. Define Health Beliefs, Locus of Control, and Self Efficacy.
3. Briefly explain the Lazarus model of stress.
4. Write a short note on any two psychological interventions in Health Psychology.
5. Explain AIDS, and list some of the risk factors of AIDS.
6. Differentiate between Chronic and Terminal illnesses with examples.

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

1. How does Illness Perception influence an individual's response to illness and their healthcare decisions?
2. How can stressors be identified, Discuss some effective stress management techniques.
3. Define Oncology and explain the risk factors, preventive measures, and psychological interventions for Cancer.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Arabic-VI **Course Code: ARB-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۔

السؤال الأول	أجب عن الأسئلة التالية بالإيجاز:	(15x2=30)
	1- هل المعلقات قصائد جاهلية ؟ 2. من ألّف "كتاب العين" ؟	
	3. من هو واضع علم العروض؟ 4. .من كان المتنبي؟ أكتب سطرين عنه.	
	5. عرّف البحر اصطلاحا؟ 6. من كان خليل بن أحمد الفراهيدي ؟	
	7. من ألّف " تاج العروس" ؟ 8. عرّف "الوتد المفروق" ؟	
	9. متى توفي المتنبي ؟ 10. في أي عصر عاش امرو القيس ؟	
	11. من رتّب ديوان الحماسة ؟ 12. اكتب وزن البحر الطويل.	
	13. عرّف ب"القصر" ؟ 14. كم قسما للفاصلة ؟	
	15. من ألف "ديون الحماسة" أولا؟	
السؤال الثاني	**أجب عن سؤالين من الأسئلة التالية بالتفصيل**	(3x10=30)
	1- اكتب رسالةً (باللغة العربية) إلى صديقك لتهنئة على زواجه.	
	2- كم بحرا للشعر ؟ اكتب وزن ثلاثة بحور مع الأمثلة. (شعر کی کل کتنی بحور ہیں؟ ان میں سے تین کے اوزان مثالوں کیساتھ لکھیں)	
	3- ما هي المعلقات السبع؟ اكتب عن سبب تسميتها واسمائها الأخرى و أصحابها .(سبع معلقات کیا ہیں؟ ان کی وجہ تسمیہ ، دیگر اسماء اور اس کے شعراء بارے جامع نوٹ لکھیں)	

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Auditing **Course Code: BBA-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)

I. What are audit procedures, and why are they important?

II. What is the purpose of an audit report?

III. What are the key responsibilities of an auditor?

IV. What factors would an auditor consider when deciding on the type of audit opinion to issue?

V. What is compliance testing in auditing?

VI. What is the purpose of an engagement letter?

Answer the following questions. (3x10=30)

Q.No.2: Enumerate the investigation of accounts and detection of frauds.

Q.No.3: What are the key steps in planning an audit, and how do they affect the overall audit strategy?

Q.No.4: How do auditors assess the risk of material misstatement in financial statements?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Taxation Management (Basic) **Course Code: BBA-307** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Define the following terms: (6x5=30)

I. Principal Officer

II. Permanent Establishment

III. Company

IV. Total Income

V. Active Taxpayer

VI. TAX

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

1. Write down 10 points of **Offenses and penalties** under sales tax act.

2. Discuss the different **Heads of Income**, also mentioned their sections.

3. Write a detailed note on **Agricultural income** and its treatment under Income Tax laws.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Management Information System **Course Code: BBA-308** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

a) Define Information Resource Management (IRM).

b) What are the key issues and challenges in implementing an MIS?

c) What are the characteristics of effective information for decision-making?

d) Explain the concept of a file in the context of data storage.

e) Differentiate between LAN (Local Area Network) and WAN (Wide Area Network).

f) What are the key applications of a DSS in modern organizations?

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

a) What is the role of ACID properties (Atomicity, Consistency, Isolation, Durability) in transaction processing?

b) What is a Decision Support System (DSS)? What are the primary goals of a Decision Support System?

c) What is network topology? Explain three network topologies and also compare them in terms of reliability.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Development Economics **Course Code: BBA-309** **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 economic welfare**

ii. **What are the characteristics of developing countries?**

iii. **Define economic growth.**

iv. **What are the characteristics of poverty?**

v. **Define globalization**

vi. **What steps might the government take to increase the education rate in developing countries?**

Answer the following questions. (3x10=30)

Q.No.2: What are measures of economic development?

Q.No.3: What are components of balance of payment?

Q.No.4: What steps can government take to resolve unemployment in a developing country?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Current Business Affairs **Course Code: BBA-310** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Define the following terms: (15x2=30)

I. Briefly describe two major benefits of globalization.
II. What is the role of World Bank in international trade?
III. Define IAEA and describe its primary function.
IV. Differentiate ASIA and ASEAN.
V. Enlist any two subsidiaries of UN with their main objectives.
VI. What is the "5th August 2019 development" regarding Jammu & Kashmir?
VII. Define Nuclear Proliferation.
VIII. What is the role of MNCs in promoting diversity across borders?
IX. Which currency is used in EU countries?
X. Define Environmental Governance.
XI. Define "NPT".
XII. What is latest package approved by IMF for Pakistan?
XIII. What is "United Nations" and what is its purpose internationally?
XIV. Define ECOSOC as an organ of UN.
XV. Enlist names of D-8 countries and describe is the main purpose of this alliance.

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

1. Discuss in details how 25th bailout package from IMF will help to stabilize Pakistan's economy.

2. Discuss the role of the United Nations (UN) in maintaining international peace & security and protecting human rights.

3. Describe the role of international treaties and discuss in details two major international treaties.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Gene Cloning (Advance Course) **Course Code: BOT-313** **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 is meant by size and copy number of a Plasmids.
2) Describe bacteriophages as cloning vehicles
3) Explain enzymes used to cut double stranded DNA?
4) Discus how viral DNA can be introduced in Bacteria.
5) Describe plasmid classification with examples.
6) Draw a diagram to extract total Cell DNA.

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

1) Describe the application of gene cloning in Gene Analysis.
2) Describe the procedure of protein synthesis by a cloned gene.
3) Explain role of gene cloning in medicine.

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

Roll No. .....

Paper: Phycology and Bryology **Course Code: BOT-313A** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

1. General accounts of Bacillariophyta
2. General characters of Xantophyta
3. General characters of Anthocerotopsida
4. General characters of Bryopsida
5. General characters of Charophyta
6. General account of bryophytes

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

1. Describe the theories of origin of Bryophytes
2. Discuss the gametophyte and sporophyte of Bryophyte
3. Draw and write the different life cycles in Chalorphyta

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Plant Tissue Culture (Advance Course) **Course Code: BOT-315** **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. What we meant by axenic culture?
2. Define the term bioreactor and they are used?
3. Differentiate between defined and undefined medium; give 2 examples of each?
4. What are secondary metabolites give examples?
5. Enlist at least 2 natural and synthetic auxins.
6. Differentiate between in vivo and in vitro cultures?
7. Define the term "Redifferentiation"?
8. What we meant by organogenesis?
9. Differentiate between hybrid and cybrids.
10. Why Phenolic compounds hinder plant growth?
11. Define the term acclimatization.
12. Why leaf material is treated with pectinase during protoplast isolation?
13. Antibiotic and antifungal compounds are not recommended to control contamination in plant tissue culture, give reason?
14. What is an explant with respect to plant tissue culture?
15. Differentiate between inoculation and incubation.

Answer the following questions. (6x5=30)

Question #2- how we can assess the viability of cells in suspension culture formation?

Question #3- Describe agricultural application of Plant Tissue Culture.

Question #4- Describe a plant tissue culture lab: materials and equipment's used for this sophisticated technique.

Question #5- What are Principal applications of anther culture?

Question #6- Describe various growth regulators used in tissue culture medium also enlist their synthetic and natural forms.

Question #7- Write down complete procedure for preparation of 1000 ml Morishige and Skoog medium.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Anatomy of Vascular Plants **Course Code: BOT-315 A** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. What are the cells in Apical meristem of plant root and shoot?
ii. Explain the position and role of laticifers.
iii. What is the position and role of root cap?
iv. Explain tracheary elements in vascular plants.
v. What is scalariform and simple perforation plate of vessels.
vi. Differentiate between sapwood and heartwood
vii. What is abscission of leaf.
viii. Describe various types of steles.
ix. Differentiate between monocot and dicot root
x. Differentiate between dorsiventral and isobilateral leaves.
xi. Differentiate between leaf gap and leaf trace
xii. What is the bundle sheath and bundle sheath extensions
xiii. How you differentiate between simple and complex tissues?
xiv. What is meant by strength of wood.
xv. What is ovule and write its types.

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

A. Discuss the types of initial cells of wood

B. Discuss the internal structure of dicot leaf.

C. Write note on anomalous secondary growth.

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

Roll No. .....

Paper: Evolutionary Trends among Spermatophytes
Course Code: BOT-319A
Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

I. Trace the stages of ovule development in angiosperms, from megaspore mother cell to embryo sac formation. Draw neat and labeled diagram to elaborate your answer.

II. What are the general characteristics of **Gnetales?** Also discuss their phylogenetic significance.

III. Differentiate between homospory and heterospory. Explain with suitable examples.

IV. Discuss the nature of endospermic tissue in angiosperms.

V. How was the integument evolved in seeds? Discuss.

VI. Discuss the morphological features of **Calamopityales.**

Answer the following questions. (3x10=30)

I. Discuss the phylogenetic importance of **Lyginopteridales** in the context of seed plant evolution. What evidence supports their placement within the seed ferns?

II. What are seed ferns? Give general characteristics of Paleozoic Seed Ferns.

III. Compare and contrast the reproductive features of **Cycadales** and **Coniferales**.

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

Roll No. .....

Paper: Plant Biochemistry (Bioenergetics and Metabolism)

Course Code: BOT-321

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 was the Meselson and Sthal experiment?
2. What is the genetic dictionary of amino acid code words, describe in detail?
3. What is the difference between 1st and 2nd genetic code and their importance?
4. Write the structure of tRNA?
5. Differentiate between various types of DNA polymerases.
6. What is the energy Balance of beta-oxidation of fat?

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

1. Write down the complete process of protein synthesis in Prokaryotes?
2. Describe "Newly synthesize polypeptide chains undergo post translational modification"
3. What are vitamins. Write down their functions and deficiency symptoms.

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

Roll No. .....

Paper: Higher Fungi **Course Code: BOT-323** **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 key features that distinguish the Hemiascomycetes from the Higher Ascomycetes?
2. What is Conidiogenesis? What are different types of Conidiomata in Ascomycetous fungi?
3. What are rust fungi? Draw and describe different spore states of rust fungi with the help of examples and diagrams.
4. What are the characteristic features of class Pyrenomycetes? Write a note on their importance.
5. Describe the casual organism, disease cycle and control strategies of "Ergot of Rye".
6. What are different types of ascocarps? Explain with the help of diagrams.

Answer the following questions. (3x10=30)

Q. No. 2: Draw and describe life cycle of smut fungi.

Q. No. 3: Describe the casual organism, symptoms and disease cycle of Powdery Mildews.

Q. No. 4: What are Lichens? Describe different types of lichens on the basis of thalli and habitat.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Classical Arabic Prose **Course Code: BSAR-308** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

السؤال (1)	أجب عن الأسئلة الآتية بإيجاز:	(6x5=30)
	1. ما الفرق بين "النثر" و"الشعر"؟ وضّح بالمثال.	
	2. ما هو "الأدب"؟ عرّف به لغة واصطلاحًا.	
	3. ما المراد بـ "العصر الجاهلي"؟ واكتب أبرز خصائص النثر فيه	
	4. ما هي الخطابة؟ واكتب أسماء أبرز الخطباء في العصر الجاهلي	
	5. من هو عبد الحميد الكاتب؟ عرّف به مع تحديد عصره	
	6. "إنّ لكلّ سَفَرٍ زادًا لا محالةَ، فتزوَّدُوْا من دُنْيَاكُمْ لآخِرَتِكُمْ التَّقْوَى، وكونوا كمن عايَنَ ما أعدَّ الله له من ثوابه وعقابه" وضّح هذه العبارة مع الذكر الموجز لقائلها؟	
السؤال (2)	**اكتب ملاحظاتك حول هذه الخطبة وصاحبها:**	**10**
	(حَمِدَ اللهَ وَأَثْنَى عَلَيْهِ، ثُمَّ قالَ: أَيُّهَا النَّاسُ! إِنِّي قد وُلِّيتُ عَلَيْكُمْ، وَلَسْتُ بِخَيْرِكُمْ، فإِنْ رَأَيْتُمُوْنِي عَلَى حَقٍّ فَأَعِيْنُوْنِي، وَإِنْ رَأَيْتُمُوْنِيْ عَلَى بَاطِلٍ فَسَدِّدُوْنِي، أَطِيعُوْنِي مَا أَطَعْتُ اللهَ فِيْكُمْ، فَإِذَا عَصَيْتُهُ فَلَا طَاعَةَ لِيْ عَلَيْكُمْ. أَلَا إِنَّ أَقْوَاكُمْ عِنْدِيْ الضَّعِيْفُ، حَتَّى آخُذَ الحَقَّ مِنْهُ، وَأَضْعَفَكُمْ عِنْدِيْ القَوِيُّ حَتَّى آخُذَ الحَقَّ لَهُ، أَقُوْلُ قَوْلِيْ هذَا وأَسْتَغْفِرُ اللهَ لِيْ وَلَكُمْ)	
السؤال (3)	**اشرح العبارة التالية وتحدّث عن صاحب هذه الخطبة مع المناسبة الّتي ألقيت فيها:**	**10**
	(يا مَعْشَرَ بَكْر! هَالِكٌ مَعْذُوْرٌ خَيْرٌ من ناجٍ فَرورٍ، إنّ الحذَرَ لا يُنْجِيْ من القَدَر، وإنَّ الصَّبْرَ من أسبابِ الظَّفَر، المنيّة لا الدَّنِيَّة، استِقْبَالُ الموْتِ خيرٌ من استدباره، الطَّعْنُ في ثُغَرِ النُّحُوْرِ أَكْرَمُ منه في الأعجاز والظُّهُوْر، يا آل بَكْر، قَاتِلُوْا فَمَا للمَنَايَا من بُدّ)	
السؤال (4)	**اكتب حول كتاب "أدب الكاتب" وصاحبه.**	**10**

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Sub Editing & Page Designing (Theory & Practice)
Course Code: BSCS-306

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 نمبر1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

1. Define sub-editing. Briefly explain its importance and scope in practical journalism.
1. سب ایڈیٹنگ کی تعریف کریں۔ عملی صحافت میں اس کی اہمیت کو مختصراً بیان کریں

2. What are the key qualities of a good sub-editor?
2. ایک اچھے سب ایڈیٹر کی اہم خصوصیات کیا ہیں؟

3. Name a few basic principles of page makeup in newspapers.
3. اخبارات میں پیج میک اپ کے چند بنیادی اصول بتائیے۔

4. Why headlines are created in newspapers? Explain with examples.
4. اخبارات میں سرخیاں کیوں بنائی جاتی ہیں۔ مثالوں کے ساتھ وضاحت کریں؟

5. How are symbols used in the mechanics of news editing? Provide examples.
5. خبروں کی تدوین میں علامتوں کو کس طرح استعمال کیا جاتا ہے؟ مثالیں فراہم کریں۔

6. what is the difference between traditional and computerized composing? which approach is more useful??
6. روایتی اور کمپیوٹرائزڈ کمپوزنگ میں کیا فرق ہے؟ کون سا طریقہ زیادہ مفید ہے؟

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

سوال نمبر2: درج ذیل سوالات کے تفصیلی جوابات تحریر کریں۔

1. Discuss in detail the responsibilities and duties of a sub-editor in the newsroom.

i. نیوز روم میں سب ایڈیٹر کی ذمہ داریوں اور فرائض کے بارے میں تفصیل سے بات کریں۔

2. What are different kinds of newspaper headlines? Explain the principles of headline creation with examples.

ii اخبارات کی سرخیوں کی مختلف اقسام کیا ہیں؟ سرخی کی تخلیق کے اصولوں کو مثالوں کے ساتھ بیان کریں۔

3. Write a detailed note on computerized page-making techniques and how they have transformed traditional newspaper layout design.

iii کمپیوٹرائزڈ پیج بنانے کی تکنیکوں پر ایک تفصیلی نوٹ لکھیں اور یہ کہ انہوں نے روایتی اخبار کے لے آؤٹ ڈیزائن کو کیسے تبدیل کیا ہے۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Research Methods-I **Course Code: BSCS-308** **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. Why is it important for a research question to align with the study's objectives?
2. Why researchers conduct basic/ academic research? What are its benefits for any field?
3. What are variables? How do they facilitate the process of hypothesis development?
4. Why is it important to define concepts clearly in a study?
5. What is the difference between nominal and ordinal levels of measurements? Discuss with the help of examples.
6. Why is it important to have a testable hypothesis in research?

Q.2 Answer the following questions. (2x15=30)

1. How do the scientific steps involved in the research, including defining the problem, formulating objectives, and reviewing literature, contribute to building a strong research framework?
2. What is experimental research and what are its pros and cons? Discuss in detail the procedure of conducting experimental research?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Theories of Communication-II **Course Code: BSCS-309** **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. What is the Knowledge Gap Hypothesis? Provide an example of how it works in society.
2. What is attitude formation? How can media play a role in shaping attitudes?
3. Explain the concept of persuasion in communication. How does it relate to the theory of attitude change?
4. Differentiate between framing and agenda setting in media studies.
5. Mention any two roles of mass media in agenda setting.

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

1. Elaborate on the Diffusion of Innovations model. How does this model explain the adoption process of new ideas or technologies? Discuss the roles of different adopter categories in this process.
2. Explore the differences between social realities and mediated realities. How does the media portray certain events or issues differently from the lived experiences of individuals or communities? Use relevant examples to support your arguments.
3. Discuss the various kinds of media effects on audiences, including direct and indirect effects, and how they vary across different levels (cognitive, emotional, behavioral, and physiological effects). Provide examples from real-life media usage.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Introduction to Advertising & Public Relations

Course Code: BSCS-310

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: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

1. Write about the benefits of Online Advertising?

آن لائن ایڈورٹائزنگ کے فوائد کے بارے میں لکھیں؟

2. Describe the different types of Public Relations.

تعلقات عامہ کی مختلف اقسام بیان کریں۔

3. What does R.A.C.E stand for? Also, briefly describe it.

R.A.C.E کا کیا مطلب ہے؟ مختصراً بیان کریں۔

4. Differentiate between a tagline and a slogan with help of an example.

ایک مثال کی مدد سے ٹیگ لائن اور سلوگن کے درمیان فرق کریں۔

5. What is your understanding of a Curtain Raiser? Briefly describe its importance.

کرٹن ریزر کے بارے میں آپ کی کیا سمجھ ہے؟ اس کی اہمیت کو مختصراً بیان کریں۔

6. Differentiate between good PR and bad PR.

اچھے اور برے پی آر میں فرق کریں۔

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

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

1) Describe the ways in which Public Relations is used to shape public opinion? Discuss.

ان طریقوں کی وضاحت کریں جن میں عوامی رائے عامہ کی تشکیل کے لیے تعلقات عامہ کا استعمال کیا جاتا ہے؟ بحث کریں۔

2) Describe the duties of a Public Relations Officer in an organization.

کسی تنظیم میں پبلک ریلیشن آفیسر کے فرائض کی وضاحت کریں۔

3) Discuss how Print Advertising is still relevant even in today's digital age.

بحث کریں کہ پرنٹ ایڈورٹائزنگ آج کے ڈیجیٹل دور میں بھی کس طرح متعلقہ ہے۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Physical Chemistry **Course Code: CHEM-313** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

I	Write two forms of the Arrhenius equation?
II	Why are ionic reactions generally faster in solution compared to covalent reactions?
III	How does the density of particles change with increasing altitude in the Earth's atmosphere?
IV	What is the Nernst Heat Theorem, and how does it relate to the Third Law of Thermodynamics?
V	What is meant by fast reactions?
VI	How does the most probable velocity depend on the temperature of the gas?
VII	What does the Second Law of Thermodynamics state, and how does it define the direction of spontaneous processes?
VIII	How does the entropy of a perfectly crystalline substance behave as the temperature approaches absolute zero?
IX	What factors influence the rate constant (k) in bimolecular reactions in solution?
X	How does flash photolysis help in studying the kinetics of fast reactions?
XI	Write down the expression of Sterling's Approximation.
XII	How is average velocity different from instantaneous velocity?
XIII	What is the effect of molar mass on the vertical distribution of gas?
XIV	What is adiabatic demagnetization?
XV	What is the Maxwell distribution of molecular velocities?

Answer the following questions. (3x10=30)

Q.2 (a) Write the "barometric formula" and explain the significance of each term.

(b) What key assumptions are made in deriving the Barometric Formula?

Q.3 (a) What is an unimolecular gas phase reaction, and how is it characterized in terms of molecularity?

(b) Why do unimolecular gas phase reactions show first-order kinetics at low pressures?

Q.4 (a) Prove that $Q = Q_t.Q_v.Q_r.Q_e$

(b) Drive any two Maxwell's relations.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Inorganic Chemistry **Course Code: CHEM-315** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

(i) How lanthanides can be separated from actinides?
(ii) What is the type of hybridization in Nickel in $Ni(CO)_4$ and $[Ni(CN)_4]^{2-}$
(iii) Metals do not form ionic or covalent bonds?
(iv) Neither La^{3+} nor Lu^{3+} ion show any colour ?why
(v) What are the toxic effects of actinides?
(vi) What is used as coolant in nuclear reactors?
(vii) Which element is used as an energy source in heart pacemakers?
(viii) What is misch metal? What are its uses?
(ix) Briefly write the occurrence of actinides in earth crust?
(x) What is hybridization in AB_9 molecule?
(xi) What is the effective nuclear charge experience by a valence p- electron in boron?
(xii) Explain the magnetic behavior of O_2 molecule by comparing its VBT and MOT pictures?
(xiii) Give two applications of metal complexes in biological systems?
(xiv) What is the difference between bent bond and bridge bond?
(xv) Give any method of preparation of metal complexes

Q.2 Explain following with suitable examples. (6x5=30)

(a) What is crystal field splitting? Give an account of the important factors which influence the magnitude of crystal field splitting.
(b) Write optical isomerism of octahedral complexes?
(c) How are lanthanides separated from different ores?
(d) How transuranic actinides were synthesized by artificial transmutation reactions?
(e) Discuss the John-Teller distortion theorem with examples?
(f) Write a note on acid opening method of monazite ore for Ln-extraction?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Organic Chemistry **Course Code: CHEM-317** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

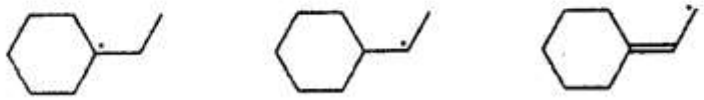
i. How would you carry out following conversions? Give name and mechanism?

ii. What techniques we can use to detect free radicals?

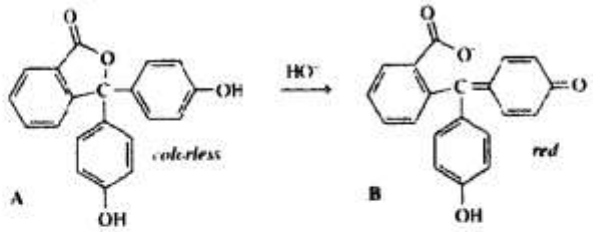
iii. Explain briefly different electronic transitions in UV.

iv. Rank each group of radicals in order of increasing stability and give reason.

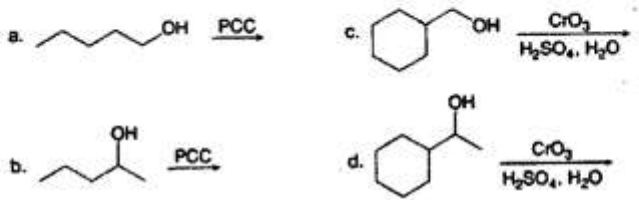
a. $(CH_3)_2\dot{C}CH_2CH(CH_3)_2$ $(CH_3)_2CH\dot{C}HCH(CH_3)_2$ $(CH_3)_2CHCH_2CH(CH_3)\dot{C}H_2$

b. 

v. Phenolphthalein is an acid base indicator that is colorless below PH 8 and red above PH 8. Explain why the first structure is colorless and the second structure is colored.



vi. Complete the following reactions.

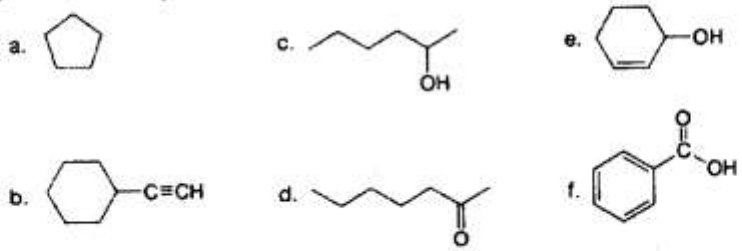


Answer the following questions.

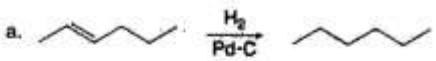
Q. No. 2 i. What is auto-oxidation? Give mechanism of auto-oidation of benzaldehyde? (5)

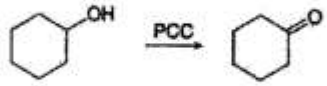
ii. Discuss different methods for oxidative cleavage of double bond? (5)

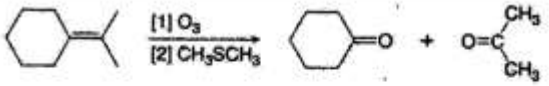
Q. No. 3 i. What major IR absorptions are present above 1500 cm–1 for each compound? (5)

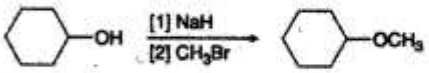


ii. Tell how IR spectroscopy could be used to determine when each reaction is complete. (5)

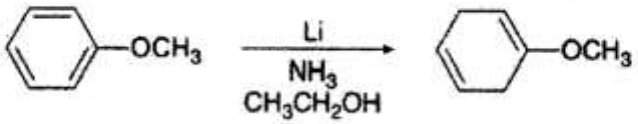
a. 

b. 

c. 

d. 

Q. No. 4. i. The Birch reduction is a dissolving metal reaction that converts substituted benzenes to 1,4-cyclohexadienes using Li and liquid ammonia in the presence of an alcohol. Draw a stepwise mechanism for the following Birch reduction. (5)



ii. Write a note on applications of free radicals. (5)

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Analytical Chemistry **Course Code: CHEM-319** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. How is ion exchange capacity defined and calculated?
ii. What is isoelectric point?
iii. What is cross-linage of resin? How is it beneficial for separation of ions?
iv. What is the basic difference between moving boundary and capillary zone electrophoresis?
v. What is difference between distribution coefficient and distribution ratio in solvent extraction?
vi. What is zeta potential? How does it help in the separation of ions by capillary electrophoresis?
vii. What is chemical interference in atomic spectroscopy? Explain with suitable example?
viii. How is atomic spectrum different from molecular spectrum?
ix. What is atomization? How can it be achieved using non-flame sources?
x. Why is there a need for Hollow cathode lamp in AAS and not in AES?
xi. Why low temperature is used for alkali and alkaline earth metals?
xii. What are the characteristics of air acetylene flame?
xiii. What is the basic difference between moving boundary and capillary zone electrophoresis?
xiv. What do you mean by percent extraction?
xv. Gel Chromatography is not considered as a form of chromatography. Comment on this statement?

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

a) Describe hydride generation in flameless method in AAS.
b) Explain the solvent extraction by flow injection analysis.
c) How neutral substances can be separated using capillary electrophoresis?
d) Briefly explain the process of packing of column and separation in gel chromatography?
e) Explain all steps involved in flow injection analysis.
f) Explain construction and working of heated graphite furnace with the help of diagram?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Applied Chemistry **Course Code: CHEM-321** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. Write down some important uses of halogen derivatives?
ii. What is a SURFACTANT?
iii. Write any two applications of Oxalic acid?
iv. What are applications of SAFETY GLASS?
v. Briefly describe REGENERATIVE PRINCIPLE of heat economy?
vi. Define glass?
vii. What is the role of cullet in glass production?
viii. Enlist any two uses of Phthalic anhydride.
ix. What is mould blowing in shaping a glass product?
x. Why glass is passed through annealing process?
xi. What are soaps?
xii. What are the common ingredients for color development in glass?
xiii. Enlist any two sulphonating agents?
xiv. Briefly describe zwitter ion detergent.
xv. What are raw materials for production of Styrene?

Q.2 Answer the following questions. (5x6=30)

i. How DETERGENTS are classified. Briefly describe each class?
ii. How PHTHALIC ANHYDRIDE is prepared from naphthalene on large scale?
iii. What are POT FURNACES? Which type of glass is produced in these furnaces?
iv. How MIRRORS are produced from glass?
v. What is Hydrogenation? How significant is this process?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Financial Management (Commerce) **Course Code: COMM-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)

a) **Importance of Financial Management**
b) **Nominal interest rate vs effective interest rate**
c) **Cash conversion cycle**
d) **Agency problem**
e) **Primary market vs secondary market**
f) **Yield to maturity**

Answer the following questions. (3x10=30)

Q.2. Alpha Enterprises a distributor of electronic equipment is considering purchasing from Beta Hardware Company the rights to market its home security system. The proposed deal calls for Alpha Enterprises to pay to the Beta Hardware Company $30000 and $32000 at the end of years 1 and 2 and to make annual year-end payments of $25000 in years 3 through year 8. A final payment to Hardware Company of $24000 would be due at the end of year 9.

a) Lay out the cash flows involved in the offer on a time line.
b) If Alpha Enterprises applies a required rate of return of 16%, what is the present value of this series of payments?
c) A second company has offered Alpha Enterprises an immediate lump sum payment of $120000 for the rights to market the home security system. Which offer should Alpha Enterprises accept?

Q.3. Lahore Corporations paid dividend of $6.50 per share in last year, and this dividend is expected to grow at an 8 percent annual rate for the next two years, and then at a 10 percent annual rate for the next four years, after which it is expected to grow at an annual 9 percent rate to infinity. By using dividend discounted model, what is the maximum price of this stock that an investor is ready to pay for it, if required rate of return of the investor is 15 percent?

Q.4. Forecast sales and purchases from November to January 20XX of Bells Company are given below:

Months	Sales	Purchases
November	$75000	$49000
December	80000	53000
January	78000	50000

The company typically collects 25 percent of its sales in the month of sales, 50 percent in the subsequent month, and 20 percent in second month after the sale. The remaining percentage is considered to be bad debts. Actual sales for the month of September and October 20XX are $70000 and $74000 respectively. Other cash collections are; $17000 in the month of November, $16000 in the month of December and $15000 in the month of January. Forty percent payment of purchases is made in the month of purchase and remaining 60 percent payment is made in the following month after purchases. Accounts payable for purchases of October are $30000. Marketing expenses will be $13000 per month. General and admin expenses will amount to $21000 per month, lease payment under long term lease contract will be $15600 per month, depreciation expenses are $10000 each month, and miscellaneous expenses will be $6000 each month. Tax payment will be made in January $12000. Payment of interest and loan repayment will due in November $20000. An equipment will be purchased in the month of December at a cost of $25000. The company will plan to pay $10000 in cash dividend and $50000 as stock dividends to its shareholders in the month of January. Cash on hand at November 1st is $13000 and a minimum cash balance of $10000 should be maintained throughout the cash budget period.

Prepare a monthly cash budget of Bells Company from November to January 20XX

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Logic & Critical Thinking (Commerce) **Course Code: COMM-309** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write short note on the followings. **(6x5=30)**

(i) Hypothetical Proposition.

(ii) Contradictories.

(iii) Fallacy of Analogy.

(iv) Universal Positive proposition.

(v) Conclusion indicator

(vi) Fallacy of amphiboly.

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

Q.2. State the broken rule and fallacy in the following.

(i) AAA-3 (ii). AEE-2 (iii) AEE-3 (iv). EIO-2 (v). AOO-2

Q.3. Put each of the syllogism into standard form, name its mood and figure.

(i). Some reformers are eccentrics, so some idealists are eccentrics; since all reformers are idealists.

(ii). Some philosophers are mathematicians; hence some scientists are philosophers, since all scientists are mathematicians.

(iii). Some mammals are not horses, for no horses are centaurs, and all centaurs are mammal.

(iv). Some evergreens are objects of worship, because all fir trees are evergreens and some objects of worship are fir trees.

(v). Some Asians are not Gujarat is, for some Asians are not Indians, and some Indians are not gujarsatis.

Q.4. Explain Tautology, self-contradictory and contingent.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: System and Network Administration **Course Code: DI-323A** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

I. What is an IP Address? How is it different from a MAC address?

II. Explain the differences between TCP and UDP in terms of reliability, flow control, and use cases.

III. What is the role of DNS in a network? How does it help in connecting users to websites?

IV. What is an SSL certificate, and why is it important for secure network communication?

V. What is a Proxy Server? Explain its functions in network security and traffic management.

Answer the following questions.

Question No.2: (10 Marks)

I. What is the function of a Domain Controller in a Windows-based network? How does it manage user authentication and network resources?

Question No.3: (2x10=20 Marks)

I. Explain the concept of IP subnetting and the importance of subnet masks in managing IP address spaces.

II. What is Network Monitoring? Explain its importance in ensuring the performance and security of a network.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Artificial Intelligence **Course Code: DI-326** **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. Visual recognition is inherently challenging for a computer. Enlist at least three challenges.
2. Explain the concept of backpropagation in the context of training an ANN.
3. A city is trying to optimize traffic light timings to reduce congestion during peak hours. How would you apply a genetic algorithm to optimize the timing of traffic lights across multiple intersections? What factors would influence your fitness function, and how would you address real-world constraints like pedestrian crossings?
4. What are the key components of First-Order Logic, and how are they used to represent knowledge?
5. What are the limitations of fuzzy logic, and how can they be addressed in complex systems?
6. How is Natural Language Processing and Artificial Intelligence related? Discuss different applications of Natural Language Processing in detail.

Answer the following questions. (3x10=30)

Q.2.

Suppose a genetic algorithm uses chromosomes of the form x = a b c d e f g h with a fixed length of eight genes. Each gene can be any digit between 0 and 9. Let the fitness of individual x be calculated as:

$$f(x) = (a + b) * (c + d) + (e + f) * (g + h)$$

and let the initial population consist of four individuals with the following chromosomes:

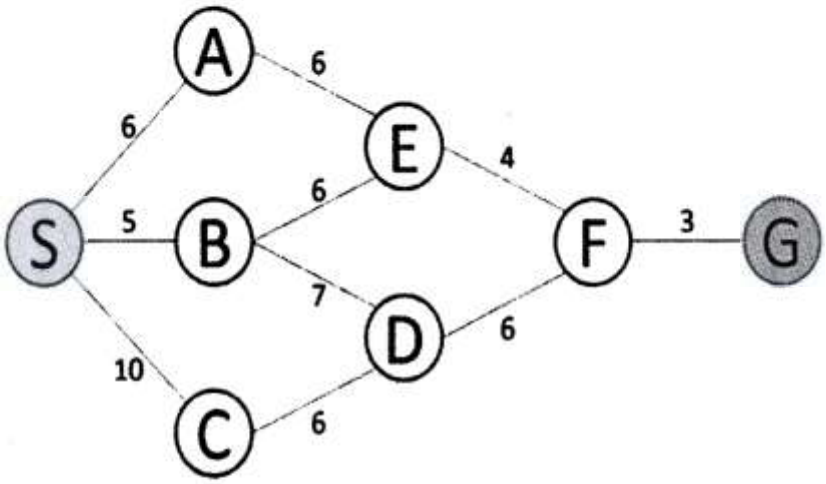
x1 = 3 2 9 2 4 2 8 5 **x2 = 1 7 8 2 2 0 9 4** **x3 = 5 6 4 0 3 5 3 2** **x4 = 1 4 8 5 6 6 0 1**

With the following information, perform the following operations:

1. Evaluate the fitness of each individual, showing all your workings, and arrange them in order with the fittest first and the least fit last.
2. Perform the following crossover operations:
   - **a.** Cross the fittest two individuals using one–point crossover at the middle point.
   - **b.** Cross the second and third fittest individuals using a two–point crossover (points b and f)
   - **c.** Cross the first and third fittest individuals (ranked 1st and 3rd) using a uniform crossover
   - **d.** Suppose the new population consists of the six offspring individuals received by the crossover operations in the above question. Evaluate the fitness of the new population, showing all your workings. Has the overall fitness improved?
   - **e.** By looking at the fitness function and considering that genes can only be digits between 0 and 9 find the chromosome representing the optimal solution (i.e. with the maximum fitness). Find the value of the maximum fitness.

Q.3.

Run **A* Search** algorithm to find the shortest path from **S (source node)** to **G (goal node)** using the following graph. Heuristic function values are provided in table separately. Also apply **BFS** and **DFS** algorithms on the provided graph.



Nodes	Heuristic Distance
S	17
A	10
B	13
C	4
D	2
E	4
F	1
G	0

Q.4.

Consider the given Dataset, apply **Naïve Bayes classification** algorithm and Predict that if a fruit has the following properties **Fruit = {Yellow, Sweet, Long}** then which type of fruit it is:

Frequency Table:

Fruit	Yellow	Sweet	Long	Total
Mango	350	450	0	650
Banana	400	300	350	400
Others	50	100	50	150
Total	800	850	400	1200

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Advanced Macroeconomics **Course Code: ECON-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. Impact of currency devaluation in developed countries
ii. Differentiate between current and capital account
iii. Rules versus discretion
iv. Phillips curve in short run.
v. Quantity Theory of Money
vi. Active versus Passive policy action

Answer the following questions. (3x10=30)

Q.2. The emergence of Keynesian Economics.

Q.3. In a small open economy explain the determination of exchange rate and national output using Mundell-Fleming Model under fixed exchange rate.

Q.4. Explain the Solow growth model for determination of national income.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Monetary Economics **Course Code: ECON-308 N** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Give short answers of the following: (6x5=30)

I. Rational expectations theory ?

II. Monetization of public debt ?

III. Role of financial intermediaries ?

IV. Money multiplier ?

V. Role of financial reforms in Pakistan?

VI. Function of a central bank ?

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

1. What are the three majors function of money. Discuss the role of money holding in the capitalist economy?

2. What is Keynesian liquidity preference framework?

3. Discuss the role of interest rate pegging to stabilize the economy by central bank.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Money, Banking & Financial Institutions
Course Code: ECON-317

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. When interest rates fall, how might you change your economic behavior?
2. How does risk-sharing benefit both financial intermediaries and private investors?
3. If the interest rate is 10%, what is the present value of a security that pays you Rs. 1,100 at the end of Year 1, Rs. 1,210 at the end of Year 2, and Rs. 1,331 at the end of Year 3?
4. Describe several factors that determine the quantity demanded of an asset.
5. What are several implications for theory of rational expectations.
6. How does the free-rider problem aggravate adverse selection and moral hazard problems in financial markets?

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

1. Explain core tenets of the Efficient Market Hypothesis and elaborate earlier evidences in favor of the hypothesis and then examine some of the more recent evidences that casts some doubt on it.
2. Explain the key puzzles regarding financial structure
3. Explain the Law of One Price and Theory of Purchase Price Parity for understanding how exchange rates are determined in the long run.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Advanced Macroeconomics **Course Code: ECON-323** **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. Expectation augmented Phillips curve
2. Labor market equilibrium
3. Real vs Nominal wages
4. Seigniorage effect on inflation
5. Devaluation and depreciation of currencies
6. Lucas Critique

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

i) Drive aggregate supply (AS) curve through sticky wage model in short-run.

ii) Drive and explain IS and LM curves of Mundell Fleming model in small open economy through diagrams.

iii) Explain golden rule of consumption and investment in Solow growth model.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Monetary Economics **Course Code: ECON-324** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

a. Explain the concept of classical dichotomy.

b. Discuss the primary functions of a central bank.

c. What are the key determinants of interest rates?

d. What are the major tools of monetary policy?

e. Explain the Phillips curve and its significance in monetary economics.

f. Differentiate between fiat money and commodity money. What are the key distinctions?

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

I. Discuss the Baumol-Tobin model of the cash management system.

II. What is money? Explain the different types and functions of money. How does the use of money address the disadvantages of the barter system? Elaborate.

III. Discuss the risk and term structure of interest rates.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Econometrics-II **Course Code: ECON-325** **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) Write down the consequences of autocorrelation for OLS estimators?

(ii) Explain the properties of Generalized Least square (GLS)?

(iii) Elaborate the Corrected Akaike Information Criterion (AICc) for model selection?

(iv) Define the concept of omitted variable bias?

(v) Define Simultaneous equation models with econometric illustration?

(vi) Explain the rules for identification?

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

(i) Define Specification errors also explain the types and consequences of specification errors?

(ii) Define heteroscedasticity, causes of heteroscedasticity, and remedial measures?

(iii) Explain the concept of Autoregressive Integrated Moving average (ARIMA) Model and its limitation?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Labor Economics **Course Code: ECON-326** **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 costs of going to work?

ii. Define elasticity of labor demand and discuss its determinants.

iii. Explain the concepts of added worker and discourage worker effects.

iv. How does competitive labor market attain equilibrium? Explain with graph.

v. Discuss the reasons for wage inequality.

vi. What is trade union? Why do they exist?

Answer the following questions. (3x10=30)

Q. 2 Discuss the short run demand curve for labor and explain why is it downward sloping.

Q. 3 Define Monopsonistic Labor Market and show how the imposition of minimum wage could affect the equilibrium wages and employment in this market.

Q. 4 What is Signaling Model? Show how education can signal the worker's innate ability in the labor market.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Managerial Economics **Course Code: ECON-328** **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. What is meant by decision science?
2. Elaborate the relationship between Marginal revenue and Price elasticity of demand.
3. Why cross price elasticity is negative for Complimentary Goods?
4. Explain the concept of linear regression analysis in demand estimation.
5. A firm sells 1000 units of a good at a price of $20 per unit. If the price elasticity of demand is -0.5, what will be the new quantity demanded if the price increases by 10%?
6. What is the difference between fixed costs and variable costs?
7. Explain the concept of market supply curve in perfect competition.
8. Define monopoly. Explain its characteristics.
9. Explain the payback period method of capital budgeting.
10. Define monopolistic competition.

Answer the following questions.

Q. No. 2 Suppose that ***Sandwich (Brand X)*** of *cafeteria of Punjab University* is facing following demand function: $Q_x = 1.5 - 3.0P_x + 0.8I + 2.0P_y - 0.6P_b + 1.2A$

Where Q_x = Sales of ***sandwich*** brand X in campus in thousands.

P_x = **Rs. 2** (Price of ***sandwich*** brand X in hundreds of rupees per sandwich)

I = **Rs. 2.5** (Students' Pocket money in hundreds of rupees.

P_y = **Rs. 1.8** (Price of the competitive of sandwich such as ***Samosa*** (Brand Y) in hundreds of rupees per ***samosa***.)

P_b = **Rs. 0.5** (Price of bread used in sandwich, in hundreds of rupees.)

A = Rs.1 (Advertising expenditures for sandwich brand X in hundreds of rupees.)

a). Determine what effect a price increase in sandwich would have on total revenue of cafeteria? **(4)**

b). Evaluate how sale of **sandwich** would change during a period of **rising pocket money** of students? **(3)**

c). Assess the probable impact if price of competing product ***samosa*** is increased? **(3)**

Q. No. 3

A. In what way can it be said that capital budgeting is nothing more that the application of theory of the firm to investment project. **(05)**

B. Write down different criteria to select an investment project. Support with numerical examples. **(05)**

Q. No. 4 Distinguish between a demand function and a demand curve. What is the difference between a change in the quantity demanded and a shift in the demand curve? **(10)**

UNIVERSITY OF THE PUNJAB

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

Roll No. ……

Paper: Agricultural Economics **Course Code: ECON-330** **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. Explain traditional agricultural farming?
2. Define Quasi Rent?
3. Explain green revolution?
4. Causes of malnutrition explain?
5. Tenant's status in Pakistan Explain?
6. Explain agriculture adequacy?
7. Convergent oscilliation explain?
8. Marketable surplus and marketed surplus?
9. Explain agricultural project planning?
10. Explain important strategy for agri-development?
11. Describe water loggin and salinity?
12. Explain farm mechanization.
13. Redistribution effect of agriculture technology?
14. Classification of agriculture technology explain?
15. What are the main crops of Pakistan?

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

1. Discuss Jorganson model of dual economy and critically evaluate.
2. Define agriculture technology explain its importance with reference to Pakistan?
3. How agricultural sector is helpful for the development of industrial sector?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Environmental and Natural Resource Economics
Course Code: ECON-427

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 pecuniary externality?

II. What is sustainability in the context of environment?

III. What are factors mitigating resource scarcity?

IV. What are renewable and non-renewable resources?

V. What are environmental policy instruments?

VI. What is the economic significance of biodiversity?

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

1. What is trans-boundary environmental issue in relation to global pollution?

2. Draw and discuss the environmental Kuznet's curve in the context of fossil fuels.

3. What is the difference between marginal abatement costs and marginal damage cost. How can we achieve the socially efficient level of emission. Explain this with help of a diagram?

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

Roll No. .....

Paper: Urdu-III **Course Code: EDE-173** **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 نمبر1: مختصر جوابات تحریر کریں۔ **(6x5=30)**

1. فصاحت سے کیا مراد ہے؟
2. آفاقیت پر نوٹ لکھئے۔
3. استعارہ کی تعریف کیجئے اور دو شعری مثالیں بھی لکھئے۔
4. مسعود حسن رضوی کی بیان کردہ شعری خوبیوں میں سے کسی ایک پر نوٹ لکھئے۔
5. کلاسکیت اور علامتیت کی تعریفیں لکھئے۔
6. زندگی ہے یا کوئی طوفان ہے ہم تو اس جینے کے ہاتھوں مر چلے

اس شعر میں ارکان تشبیہ کی نشاندہی کریں۔

سوال نمبر2: مندرجہ ذیل سوالات کے تفصیلی جواب تحریر کیجیے۔ **(3X10=30)**

1. لف و نشر پر تفصیلی نوٹ لکھئے اور مثالیں بھی دیجئے۔
2. میر و سودا کے دور پر تفصیلی نوٹ لکھئے اور مثالیں بھی دیجئے۔
3. "ادب اور زندگی" پر مضمون لکھئے۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Research in Education **Course Code: EDE-324** **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. Write the characteristics of an educational research problem.
2. Describe the role of teacher in educational research.
3. What is referencing in research?
4. Write any five characteristics of Basic Research.
5. What is ethics in research?
6. What skills do you need to be a good researcher?

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

1. Why is research in the field of education important? Illustrate your answer with examples.
2. Write the significance of research report. Explain in detail the various parts of research report.
3. Why is sampling important in research? Describe any three sampling techniques commonly used in educational research.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Methods of Teaching Social Studies in Elementary School

Course Code: EDE-375

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 objectives of Teaching Social Studies in elementary schools

ii. What is the importance of Lesson Plan?

iii. Differentiate between General and Specific objectives

iv. Write a note on teaching aids in Education

v. Describe Story telling method of teaching.

vi. Give the merits and demerits of Subjective type tests.

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

i. What are the objectives of using teaching aids in classroom?

ii. Give the General/professional Characteristics of good teacher.

iii. What are the objectives of assessment in teaching? Describe the types of assessment used in teaching

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

Roll No. .....

Paper: Mobile Application Development **Course Code: EI-333** **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) What is the purpose of android emulator?
2) What is intent?
3) What is autocompletetext view in android?
4) What is the purpose of <resources> in android?
5) What is relative layout?
6) What is activity?

Q.2. Answer the following questions. (2x15=30)

1. What is Image Switcher? Give an example? Mention its method also.
2. What are fragments? Write any three differences between fragment and activity. Explain its lifecycle in detail.

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

Roll No. .....

Paper: Criticism and Theory-II **Course Code: ENG-307** **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) Is there any difference between an artist and a critic in Oscar Wilde.

b) How does Plotinus theorize intellectual beauty?

c) Do we need English Departments?

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

a) Write a detailed note on the main ideas in Hegel.

b) What is a myth? And what role does it play in modern culture according to Barthes?

c) Write down main ideas in Charles Baudelaire.

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

Roll No. .....

Paper: Classics in Drama **Course Code: ENG-308** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

1. (i) How did Oedipus save Thebes before becoming its king?

   (ii) What was the riddle posed by Sphinx to Oedipus?

2. How are the Good Angel and the Evil Angel related to earlier morality plays?

3. Why is freedom important in the play "A Doll's House"?

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

1. R.M. Dawkins once called Faustus "a Renaissance man who had to pay the medieval price for being one." Do you think this is an accurate characterization of Marlowe's tragic hero?

2. Characterize the relationship between Macbeth and Lady Macbeth. If the main theme of Macbeth is ambition, whose ambition is the driving force of the play—Macbeth's, Lady Macbeth's, or both?

3. Twelfth Night is based on a series of mistaken identities and disguises of one sort or another. Identify as many of the disguises as you can, and explain how each of them functions in the plot development.

UNIVERSITY OF THE PUNJAB

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

Roll No. ……

Paper: 19th Century Poetry **Course Code: ENG-309** **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. 'The Divine Image', Portrays an Ideal World, explain.

ii. Wordsworth is a poet of Nature, explain.

iii. Explain the Poetic Point of view of S.T. Coleridge with reference to 'Dejection: An Ode'.

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

i. 'Ode on a Grecian Urn' presents a romantic wish to find eternal beauty, within and without.

ii. Write down critical appreciation of Shelley's Poetic approach with reference to 'Ode to the West Wind'.

iii. Explain how Earth is personified as a woman, with reference to William Black's poem, 'Earth's Answer'.

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

Roll No. .....

Paper: Fantasy **Course Code: ENG-310** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

1. How does the "Riddles in the Dark" hint at the linguistic structure of the narrative?
2. Comment on the significance of Mirror of Erisid in Harry Potter and the Sorcerer's Stone.
3. How is the father son relationship explored in "The Door in the Wall"?

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

1. Mary Shelley explores moral dilemmas in "The Mortal Immortal". Discuss.
2. Stephen King's "Word Processor of the Gods" is a story about the consequential reality of human choices. Elaborate.
3. Harry Potter's biggest strength is his biggest weakness. Discuss with reference to Harry's views on friendship and a disrespect for rules.

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

Roll No. .....

Paper: World Literatures in Translation **Course Code: ENG-311** **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. In *Don Quixote*, why does Sancho Panza agree to follow Don Quixote?

II. In *Metamorphosis*, how does Gregor Samsa's transformation affect his relationship with his family?

III. In Bulleh Shah's *Not a Believer Inside the Mosque*, how does the poet challenge traditional notions of worship?

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

I. Analyze the theme of alienation in *The Outsider* by Albert Camus.

II. In *Don Quixote*, how does Don Quixote's perception of reality differ from the perceptions of other characters?

III. Compare how love is portrayed in one of Bulleh Shah's poems and one of Iqbal's verses from *Secrets of the Self*.

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

Roll No. .....

Paper: Later Mughals & British India (1707-1857)

Course Code: HIS-304

Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. *Muntakhib-ul-Lubab*
ii. Causes of the Battle of Plassey
iii. Karen Leonard's 'Great Firm' theory of the Decline of the Mughal Empire
iv. Bahadur Shah-I
v. The Doctrine of Lapse
vi. Jihad Movement

Q.2. Answer the following questions. (2x15=30)

1. **Critically evaluate the role of power politics of Mughal nobility in the decline of Mughal Empire.**

2. **Write a detailed essay on the causes of the failure of the War of independence in 1857.**

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: History of the Punjab (1707-1947) **Course Code: HIS-307** **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 note on the followings. **(5x6=30)**

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

i. Sikindar Hayat

i. سکندر حیات

ii. Jallianwala Bagh Tragedy

ii. جلیانوالہ باغ سانحہ

iii. Mian Fazal-i-Hussain

iii. میاں فضل حسین

iv. Khaksar Tehrik

iv. خاکسار تحریک

v. Masjid Shaheed Ganj

v. مسجد شہید گنج

Q.2. Answer the following questions. **(2x15=30)**

سوال نمبر 2: درج ذیل سوالات کے تفصیلاً جوابات تحریر کریں۔

i. Discuss the factors which led the British to annex Punjab in 1849.

i. ان عوامل کا جائزہ پیش کریں جن کی وجہ سے 1849 میں انگریزوں نے پنجاب کا الحاق کیا؟

ii. Why did the British enact the Land Alienation Act of 1900? How far was it successful?

ii. انگریزوں نے قانون منتقلی اراضی 1900 کیوں بنایا؟ یہ کہاں تک کامیاب رہا؟

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Specialization in One Group of Track & Field (Elect.4)
Course Code: HPE-311

Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

سوال نمبر1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

i. What is a changeover zone in a relay race and how long is the changeover area?

i. ریلے ریس میں چینج اوور زون کیا ہے اور چینج اوور ایریا کتنا لمبا ہے؟

ii. How many track events are there in athletics? What makes you a good track athlete?

ii. ایتھلیٹکس میں کتنے ٹریک ایونٹس ہیں جو آپ کو ایک اچھا ٹریک ایتھلیٹ بناتا ہے؟

iii. What is decathlon? How many events are in a decathlon?

iii. "ڈیکاتھلوں" کیا ہے؟ ڈیکاتھلون میں کتنے ایونٹ ہوتے ہیں؟

iv. What is IAAF? What is motto of modern Olympic? What the five rings represent to?

iv. "IAAF" کیا ہے؟ ماڈرن اولمپکس کا موٹو کیا ہے؟ فائیو رنگز کیا نمائندگی کرتے ہیں؟

v. What are the five fundamental skills needed in track events?

v. "ٹریک ایونٹس" میں پانچ بنیادی مہارتوں کی کیا ضرورت ہے؟

vi. What are the safety precautions should be taken in “Javelin throw” event during competition for avoiding any accident or injury?

vi. چوٹ میں کسی حادثے سے بچنے کے لئے مقابلے کے دوران "جیولین تھرو" ایونٹ میں حفاظتی احتیاطی تدابیر کیا ہیں؟

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

سوال نمبر2: درج ذیل سوالات کے تفصیلی جوابات تحریر کریں۔

i. Draw the sector of Javelin throw or discuss throw & write the fouls of it.

i. جیولین تھرو کا سیکٹر ڈرا کریں یا ڈسک تھرو کا سیکٹر ڈرا کریں اور اسکے فاؤلز لکھیں۔

ii. Write down the fouls of high jump and how tie solve in high jump.

ii. ہائی جمپ کے فاؤلز لکھیں اور ہائی جمپ میں ٹائی کو کیسے حل کیا جاتا ہے۔

iii. Write the rules and fouls of 4 x 400m relay race.

iii. 4 x 400m ریلے ریس کے قوائد اور فاؤلز لکھیں؟

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Research Methodology in Physical Education (Major 3)
Course Code: HPE-312

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 Qualitative and Quantitative Research?

ii. What is Statement of the Problem?

iii Define Type-I Error and Type-II Error with Reference to Sampling?

iv Define Deductive and Inductive Research?

V Highlight the Basics Tools of Data Collection?

Vi Define Validity and Reliability?

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

i. What is Research? Discuss in detail the Basic Steps of Selecting a Suitable Research Problem.

ii. Write down a detail Note on Test as Data Collection Tool?

iii Explain in detail the Basics Source for Locating a Research a Problem?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Planning Sports Facilities (Foundation 9) **Course Code: HPE-313** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Give short and comprehensive answers of the following terms: (6x5=30)

i. Gymnasium
ii. Contingency Plans
iii. Billiard Hall
iv. Facilities at Club Level
v. Orthopedic Lab
vi. Stadium

Q.2. Answer the following questions.

i. Define Planning? Plan general considerations in building an Athletic Track. (2+8=10)
ii. Write about Sports Psychology and Sports Bio mechanics Lab. (5+5=10)
iii. Define Facility. Explain facilities for administration and staff in a Sports complex. (2+4+4)

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Roll No. .....

Paper: Test Measurement & Evaluation in Physical Education & Sports (Major 4)

Course Code: HPE-314

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 Measurements? With examples.

II-. Reliability

III- What are the objectives of Harvard Test?

IV- Domain of Psychomotor tests.

V- Post Test responsibilities of administration

VI- Criterion- Reference Measurements.

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

1. Define Reliability and what are the different methods to find out the reliability of a good test.
2. Which steps are necessary during the constructions of a good Knowledge Test?
3. Write the administration and scoring criteria of a valid and reliable volleyball skill test.

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Roll No. .....

Paper: Sports Psychology (Major 5) **Course Code: HPE-315** **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 Psychology?

ii. Highlight the Branches of Psychology

iii Define Stress and Anxiety?

Iv Define Self-confidence and Self-esteem?

V Explain the Types of Personality?

Vi Define Self-talk?

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

i. Define Psychology? Also discuss the Role of Psychology in Sports.

ii. Differentiate Arousal? Also write down the causes and signs & Symptoms of Anxiety.

iii What is Imagery? Explain the Basics Types of Imagery in detail?

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Roll No. .....

Paper: Environmental Sciences (General 6) **Course Code: HPE-316** **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. Sustainable development and Environment
II. Land and Landscape
III. Mesosphere
IV. Natural resources in ecosystem
V. Atmosphere
VI. Global food conditions

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

I. Briefly explain different types of pollution and pollutants?
II. Explain Agricultural, animal husbandry and fishery with reference to Environmental Sciences?
III. Elaborate your answer with examples for Ethics and environmental issues regarding sports?

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Roll No. .....

Paper: Translation of Holy Quran **Course Code: HQ-006** **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 نمبر1: مندرجہ ذیل آیات کا اردو / انگریزی میں ترجمہ کریں: (6x5=30)

Q.1. Translate the following Verses into Urdu or English Language.

1. قَالَ آمَنتُمْ لَهُ قَبْلَ أَنْ آذَنَ لَكُمْ إِنَّهُ لَكَبِيرُكُمُ الَّذِي عَلَّمَكُمُ السِّحْرَ فَلَسَوْفَ تَعْلَمُونَ لَأُقَطِّعَنَّ أَيْدِيَكُمْ وَأَرْجُلَكُم مِّنْ خِلَافٍ وَلَأُصَلِّبَنَّكُمْ أَجْمَعِينَo قَالُوا لَا ضَيْرَ إِنَّا إِلَى رَبِّنَا مُنقَلِبُونَo
2. وَالشُّعَرَاء يَتَّبِعُهُمُ الْغَاوُونَo أَلَمْ تَرَ أَنَّهُمْ فِي كُلِّ وَادٍ يَهِيمُونَo وَأَنَّهُمْ يَقُولُونَ مَا لَا يَفْعَلُونَo إِلَّا الَّذِينَ آمَنُوا وَعَمِلُوا الصَّالِحَاتِ وَذَكَرُوا اللَّهَ كَثِيرًا وَانتَصَرُوا مِن بَعْدِ مَا ظُلِمُوا وَسَيَعْلَمُ الَّذِينَ ظَلَمُوا أَيَّ مُنقَلَبٍ يَنقَلِبُونَo
3. وَلَقَدْ آتَيْنَا دَاوُودَ وَسُلَيْمَانَ عِلْمًا وَقَالَا الْحَمْدُ لِلَّهِ الَّذِي فَضَّلَنَا عَلَى كَثِيرٍ مِّنْ عِبَادِهِ الْمُؤْمِنِينَo وَوَرِثَ سُلَيْمَانُ دَاوُودَ وَقَالَ يَا أَيُّهَا النَّاسُ عُلِّمْنَا مَنطِقَ الطَّيْرِ وَأُوتِينَا مِن كُلِّ شَيْءٍ إِنَّ هَذَا لَهُوَ الْفَضْلُ الْمُبِينُo
4. قُلِ الْحَمْدُ لِلَّهِ وَسَلَامٌ عَلَى عِبَادِهِ الَّذِينَ اصْطَفَى اللَّهُ خَيْرٌ أَمَّا يُشْرِكُونَo أَمَّنْ خَلَقَ السَّمَاوَاتِ وَالْأَرْضَ وَأَنزَلَ لَكُم مِّنَ السَّمَاء مَاء فَأَنبَتْنَا بِهِ حَدَائِقَ ذَاتَ بَهْجَةٍ مَّا كَانَ لَكُمْ أَن تُنبِتُوا شَجَرَهَا أَإِلَهٌ مَّعَ اللَّهِ بَلْ هُمْ قَوْمٌ يَعْدِلُونَo
5. أَمَّن يُجِيبُ الْمُضْطَرَّ إِذَا دَعَاهُ وَيَكْشِفُ السُّوءَ وَيَجْعَلُكُمْ خُلَفَاء الْأَرْضِ أَإِلَهٌ مَّعَ اللَّهِ قَلِيلًا مَّا تَذَكَّرُونَo أَمَّن يَهْدِيكُمْ فِي ظُلُمَاتِ الْبَرِّ وَالْبَحْرِ وَمَن يُرْسِلُ الرِّيَاحَ بُشْرًا بَيْنَ يَدَيْ رَحْمَتِهِ أَإِلَهٌ مَّعَ اللَّهِ تَعَالَى اللَّهُ عَمَّا يُشْرِكُونَ o

سوال نمبر2: مندرجہ ذیل الفاظ کا اردو / انگریزی میں ترجمہ کریں۔ (10x1=10)

Q.2. Write the meanings of the following Qur'anic words.

الفاظ	معانی	الفاظ	معانی
أَنجَيْنَا		كَلَّا	
سَيَهْدِينِ		بُشْرَى	
الْعَزِيزُ		فِرَق	
عَصَا		كَرِيم	
نَبَأ		النَّار	

سوال نمبر3: مندرجہ ذیل الفاظ کی مدد سے واحد کی جمع لکھیں۔ (10x1=10)

Q.3. Write the plural with the given words.

واحد	جمع	واحد	جمع	واحد	جمع	واحد	جمع
آيَة		رجل		سَاجِد		وارث	
نملة		حامل		لون		ثقل	
مُؤْمِن		قانت		غائب		امرأة	
الأول		حَاشِر		كاذب		موقن	
عُنق		مُقَرَّب		جَنَّة		جند	

سوال نمبر4: آیات کو ان کے ترجمے سے لکیر کے ذریعے ملائیں: (5x1=10)

Q.4. Match the verses with lines to the translation.

آیات	ترجمہ
1 فَلَوْ أَنَّ لَنَا كَرَّةً فَنَكُونَ مِنَ الْمُؤْمِنِينَ	یقین رکھو ہم اسے واپس تمہارے پاس پہنچا کر رہیں گے، اور اس کو پیغمبروں میں سے ایک پیغمبر بنائیں گے۔
2. إِنْ حِسَابُهُمْ إِلَّا عَلَى رَبِّي لَوْ تَشْعُرُونَ	بیشک اس میں ضرور نشانی ہے اور ان میں اکثر مسلمان نہ تھے
3. إِنَّا رَآدُّوهُ إِلَيْكِ وَجَاعِلُوهُ مِنَ الْمُرْسَلِينَ	کاش ہمیں (دنیا میں) پھر جانا ہو تم ہم مومنوں میں ہو جائیں
4. إِنَّ فِي ذَٰلِكَ لَآيَةً وَمَا كَانَ أَكْثَرُهُم مُّؤْمِنِينَ	اور اپنی رحمت سے مجھے اپنے نیک بندوں میں شامل فرمالیجئے۔
5. وَ اَدْخِلْنِيْ بِرَحْمَتِكَ فِيْ عِبَادِكَ الصّٰلِحِيْنَ	ان کا حساب تو میرے رب کے ذمہ ہے اگر تمہیں شعور ہو تو

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Roll No. .....

Paper: Tafsir-IV **Course Code: ISE-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۔

سوال نمبر 1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔ **(6x5=30)**

i. تقسیم وراثت میں "عول" سے کیا مراد ہے؟

ii. کلالہ سے کیا مراد ہے؟ اس کے احکام بیان کریں۔

iii. حد سرقہ سے کیا مراد ہے؟ نیز اس کی سزا کے نفاذ کی شرائط تحریر کریں۔

iv. حد اور تعزیر میں فرق واضح کریں۔

v. پاکستان میں قصاص و دیت آرڈیننس کی وضاحت کریں۔

vi. حد قذف سے کیا مراد ہے؟ اس کے اجراء کی شرائط تحریر کریں۔

سوال نمبر 2: درج ذیل سوالات کے جواب تحریر کیجیے۔ **(3X10=30)**

i. اسلام کے اصول وراثت پر جامع نوٹ لکھیں۔

ii. پاکستان میں حدود آرڈیننس کے نفاذ کے لیے کی جانے والی کوششوں کا تفصیلی جائزہ لیں۔

iii. درج ذیل آیت کا ترجمہ اور تشریح کریں۔

يَا أَيُّهَا الَّذِينَ آمَنُوا إِنَّمَا الْخَمْرُ وَالْمَيْسِرُ وَالْأَنصَابُ وَالْأَزْلَامُ رِجْسٌ مِّنْ عَمَلِ الشَّيْطَانِ فَاجْتَنِبُوهُ لَعَلَّكُمْ تُفْلِحُونَ

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Roll No. .....

Paper: History & Principles of Hadith **Course Code: ISE-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: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔ **(6x3=30)**

I. معلق، معضل اور مرسل کا فرق واضح کریں۔

II. مسند حدیث اور مسند کتاب حدیث میں کیا فرق ہے؟

III. امام بخاری کے فنِ حدیث میں کمال پر چند سطریں لکھیں۔

IV. جامع ترمذی کی چند خوبیاں تحریر کریں۔

V. صحیفہ صادقہ سے کیا مراد ہے؟

VI. حفاظتِ حدیث کے مختلف طریقوں پر روشنی ڈالیں۔

سوال نمبر 2: **درج ذیل سوالات کے جواب تحریر کیجیے۔** **(3x10=30)**

I. کیا کتابتِ حدیث کا آغاز نبی کریم ﷺ کے دور میں ہو چکا تھا؟ دلائل سے ثابت کریں۔

II. طبقاتِ رواۃ وضاحت کے ساتھ لکھیں۔

III. امام مسلم کے حالاتِ زندگی تحریر کریں۔

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Roll No. .....

Paper: Islamic Jurisprudence & its History **Course Code: ISE-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۔

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

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

1. What is meant by Qawl Sahabi (statement of a companion)? Explain with evidence.

1. قول صحابی سے کیا مراد ہے دلیل سے واضح کریں۔؟

2. Define the Arkan al-Qiyas (elements of analogy) and their definitions.

2. قیاس کے ارکان اور ان کی تعریفات لکھیں۔؟

3. What are the conditions for using 'Urf (custom) as evidence in Islamic rulings?

3. عرف کو احکام کی دلیل بنانے کی شرائط بیان کریں۔؟

4. Provide a Quranic proof for the Hujiyyat al-Ijma' (authenticity of consensus).

4. اجماع کی حجیت پر ایک قرآنی دلیل پیش کریں۔؟

5. What do Mufassar and Muhkam mean? Give one example for each.

5. مفسر اور محکم سے کیا مراد ہے۔ ایک ایک مثال ذکر کریں۔؟

6. What are the Maani' Sabab (preventers of the cause)?

6. مانع سبب کون کون سے ہیں۔؟

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

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

1. What is Hukm Takleefi (the duty-related ruling)? Write a detailed note on its various categories.

1. حکم تکلیفی سے کیا مراد ہے۔ اس کی اقسام پر مفصل نوٹ تحریر کریں۔؟

2. Write a detailed essay on the Maqasid al-Shari'ah (objectives of Sharia).

2. مقاصد شریعت پر تفصیلی مضمون قلمبند کیجیے۔؟

3. Discuss in detail the differences between Khaas (specific) and Aam (general).

3. خاص اور عام پر تفصیلاً بحث کریں۔؟

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Roll No. .....

Paper: Internet Programming (IT) **Course Code: IT-308** **Time: 3 Hrs. Marks: 60**

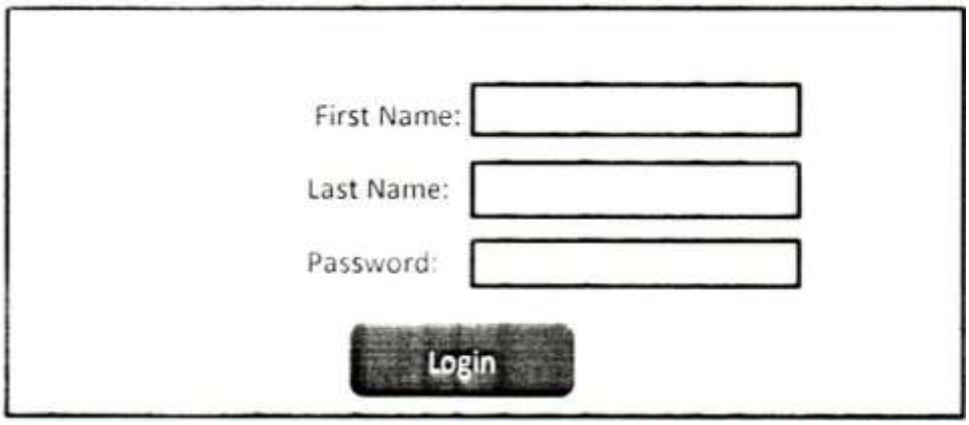
THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

1) What is the purpose of <h1> and </h1> tag?
2) Difference between static website and dynamic website?
3) What is internal Css?
4) Define the term session tracking.
5) Define MVC architecture.
6) What is the purpose of struts?

Q.2. Answer the following questions. (2x15=30)

1. Write code for login page in HTML:



2. What are the term handling cookies? Define java servlets and write its advantages.

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Roll No. .....

Paper: Computer Networks (CMP) **Course Code: IT-309** **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. What is the difference between public IP and private IP addresses?
II. How does encryption protect data during transmission?
III. What are the key differences between a wired and wireless network in terms of hardware requirements?
IV. How does a proxy server help in securing network communications?
V. Explain the UDP and TCP, which one is best and why?

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

I. Describe the various types of network devices used in a computer network, including hubs, switches, routers, and gateways. Discuss their functions and how they differ in terms of data forwarding, network segmentation, and network security.

II. Explain the concept of network management. Discuss the various tools and techniques used for monitoring and managing network performance, security, and troubleshooting.

III. What is a firewall? Explain the different types of firewalls (packet filtering, stateful inspection, and proxy) and their roles in securing a network. How do firewalls filter traffic based on IP addresses, ports, and protocols.

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Roll No. .....

Paper: Linear Algebra (MA) **Course Code: IT-312** **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. Find the initial point of the vector that is equivalent to $\boldsymbol{u} = (1, 1, 3)$ and whose terminal point is $B(-1, -1, 2)$?

II. The planes $x + 2y - 2z = 3$ and $2x + 4y - 4z = 7$ are parallel, since their normals. $(1, 2, -2)$ and $(2, 4, -4)$ are parallel vectors. Find the distance between these planes?

III. Find the image of $x = (1, 1)$ under a rotation of $\pi/6$ radians ($= 30°$) about the origin?

IV. Determine whether the three vectors $\boldsymbol{v_1} = (2, -2, 0), \boldsymbol{v_2} = (6, 1, 4), \boldsymbol{v_3} = (2, 0, -4)$ lie in a plane in R^3?

V. Determine whether $\boldsymbol{f_1} = x$ and $\boldsymbol{f_2} = \sin x$ are linearly independent or dependent vectors in $C^{\infty}(-\infty, +\infty)$?

VI. Verify that $rank(A) = rank(A^T)$. $A = \begin{bmatrix} 1 & 2 & 4 & 0 \\ -3 & 1 & 5 & 2 \\ -2 & 3 & 9 & 2 \end{bmatrix}$.

Answer the following questions. (3x10=30)

Q.2. Determine the values of 'a' for which the system has no solutions, exactly one solution, or infinitely many solutions? $x + 2y - 3z = 4,\ 3x - y + 5z = 2,\ 4x + y + (a^2 - 14)z = a + 2$.

Q.3. Find the rank and nullity of the matrix A by reducing it to row echelon form.

$$A = \begin{bmatrix} 1 & -2 & 2 & 3 & -1 \\ -3 & 6 & -1 & 1 & -7 \\ 2 & -4 & 5 & 8 & -4 \end{bmatrix}$$

Q.4. Show that the operator $T : R^2 \to R^2$ defined by the equations $w_1 = 2x_1 + x_2,\ w_2 = 3x_1 + 4x_2$ is one-to-one, and find $T^{-1}(w_1, w_2)$?

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Roll No. .....

Paper: Introduction to Psychology (HM) **Course Code: IT-313** **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. Evaluate the definition of Psychology as a Science of Mental Processes and Behavior?

II. What is the difference between Id, Ego and Superego?

III. Explain internal and external determinants of Attention?

IV. Differentiate between Short term memory and Long term memory?

V. Define Sensation and its various types?

VI. Explain dream as Supernatural Phenomena?

Q.2. Answer the following questions. (2x15=30)

I. What is Development? Write down the physical, psychological and socio-emotional aspects of developmental stages of human being.

II. Discuss different Behavioral Disorders in Psychology. Also explain causes and symptoms of each behavioral disorder.

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Roll No. .....

Paper: Real Analysis-II **Course Code: MATH-307** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following. (6x5=30)

1. Show that the product of two functions of bounded variation is also of bounded variation.
2. Check whether the sequence of functions $\{f_n\}$ where $f_n(x) = \dfrac{1}{(x+n)}$, is uniformly convergent in any interval $[0, b]$, $b > 0$.
3. Examine the convergence of
$$\int_0^2 \frac{dx}{2x - x^2}$$
4. Show that a constant function k is integrable and
$$\int_a^b k dx = k(b-a).$$
5. If f is bounded and integrable on $[a, b]$ and k is a number such that $|f(x)| \leq k$, $\forall x \in [a, b]$, then
$$\left|\int_a^b f dx\right| \leq k|b-a|.$$
6. If f is monotonic on $[a, b]$, and if α is continuous on $[a, b]$, the $f \in R(\alpha)$.

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

1. Let $\{f_n\}$ be a sequence of functions, such that
$$\lim_{n\to\infty} f_n(x) = f(x), \quad x \in [a, b]$$
and let
$$M_n = \sup_{x\in[a,b]} |f_n(x) - f(x)|.$$
Then $f_n \to f$ uniformly on $[a, b]$ if and only in $M_n \to 0$ as $n \to \infty$.
2. Examine the convergence of
$$\int_0^1 \frac{dx}{\sqrt{1-x^3}}$$
3. A function f is integrable on $[a, b]$ iff there is a number I lying between $L(P, f)$ and $U(P, f)$ such that for any $\varepsilon > 0$, there exists a partition P of $[a, b]$ such that
$$|U(P, f) - I| < \varepsilon, \quad \text{and} \quad |I - L(P, f)| < \varepsilon.$$

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Rings and Vector Spaces **Course Code: MATH-308** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following

(i)	Prove that every finite integral domain is a field.	(5)
(ii)	Let R be a commutative ring with 1 as its identity element. Let I be an ideal in the ring R, then $I = R$ if and only if $1 \in I$.	(5)
(iii)	Prove that $W = \{(0,a,b) \mid a,b \in \mathbb{R}\}$ is a subspace of $\mathbb{R}^3$	(5)
(iv)	State Gram Schmidt Process and explain with example.	(5)
(v)	Diagonalize the matrix $\begin{pmatrix} 1 & 4 \\ 3 & 2 \end{pmatrix}$ if possible.	(5)
(vi)	Show that the homomorphic image of a commutative ring is commutative.	(5)

Solve the following.

Q.2		Prove that a one-to-one linear transformation preserves basis and dimension.	(10)
Q.3		Find the Eigen Values and eigen vectors of $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$	(10)
Q.4		Let R be a commutative ring and $a \in R$, then $aR = \{ar : r \in R\}$ is an ideal in R.	(10)

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

Roll No. .....

Paper: Complex Analysis-II **Course Code: MATH-309** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following (6x5=30)

A) State Cauchy Residue Theorem. Give one example.
B) Find a duplication formula for Weistrass Phi Function.
C) Suppose that function f is analytic in a deleted neighborhood of Z_0 which is a simple pole then prove that $Res[f(Z), Z_0] = \lim_{Z \to Z_0}(Z - Z_0)f(Z)$.
D) State Jordan Lemma and when it can be used to solve real integrals.
E) Discuss the nature of singular points of the function $F(Z) = \frac{CosZ}{Z}$
F) Prove that minimum order of the elliptic function is two and it is surjective with each point of the complex plane taken at least two times.

Solve the following. (3x10=30)

Q2) Find Cauchy Principal Value of the integral $\int_{-\infty}^{\infty} \frac{x \sin x dx}{x^2 + 2x + 2}$

Q3) Compute Mittag-Leffler expansion of the function $CscZ$.

Q4) Prove that Weierstrass elliptic function has the unique power series expansion as

$$\frac{1}{Z^2} + aZ^2 + bZ^4 + ...$$

about integer lattice points.

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

Roll No. .....

Paper: Mechanics **Course Code: MATH-310** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following **(6x5=30)**

(i) Define Linear Density, Surface Density and Volume Density.

(ii) Three particles of masses 2, 1, 3 respectively have position vectors

$\vec{r}_1 = 5t\,\hat{i} - 2t^2\hat{j} + (3t-2)\hat{k}$, $\vec{r}_2 = (2t-3)\hat{i} + (12-5t^2)\hat{j} + (4+6t-3t^3)\hat{k}$,

$\vec{r}_3 = (2t-1)\hat{i} + (t^2+2)\hat{j} - t^3\hat{k}$

where t is the time. Find

(a) the velocity of the center of mass at time $t = 1$ and

(b) the total linear momentum of the system at $t = 1$.

(iii) Suppose we drop a ball from a height 'h'. what is the effect of Coriolis force?

(iv) Show that the moment of inertia of a uniform rod of mass m and length $2a$ about an axis through the midpoint inclined at an angle α to the rod is $I = \frac{1}{3}ma^2\sin^2\alpha$.

(v) Define Spherical Top, Symmetrical Top, Asymmetrical Top.

(vi) State and prove the Perpendicular axis theorem.

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

Q.2 A three particle system consists of masses and coordinates given as follows:

$m_1 = 3m, \quad (b,0,b)$

$m_2 = 4m, \quad (b,b,-b)$

$m_3 = 2m, \quad (-b,b,0)$

Find the inertia tensor, principal axes, and principal moments of inertia.

Q.3 Express the components of angular velocity in terms of Euler's angles.

Q.4 State parallel axes theorem. Also calculate parallel axes theorem in term of radius of gyration.

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

Roll No. .....

PAPER: Functional Analysis-I **Course Code: MATH-311** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following questions: (5x6=30)

(i) Let (X,d) and (Y,d') be complete metric spaces. Show that the cartesian product, $P = X \times Y$ of X and Y, is also complete metric space.

(ii) Let X, Y be metric spaces and $f : X \to Y$ be a function. Then f is continuous at a point a in X if and only if, for all sequences $\{x_n\}$ in X which converge to a, the sequence $\{f(x_n)\}$ converges to $f(a)$.

(iii) Let $\sum x_n$ be an absolutely convergent series in a Banach space. Then prove that $\sum x_n$ is convergent.

(iv) Define convex set. Show that the intersection of two convex sets is a convex set.

(v) Define first category and second category. Discuss the category of the set Z of integers as a subspace of real line.

Q.2. Solve the following questions. (5x6=30)

(a) For any normed space N, prove that the function $f : N \times N \to N$ defined by $f(x,y) = x+y,\ \ x,y \in N$ is uniformly continuous, and the function $g : F \times N \to N$ defined by $g(a,x) = ax, a \in F, x \in N$ is continuous.

(b) Let S be a closed subspace of a Banach space N. Then show that the quotient space N/S is a Banach space with norm $\|x+S\|_1 = \inf_{s\in S}\|x+s\|$.

(c) For the space $C[a,b]$ of all real-valued continuous functions from $[a,b]$ to R with the sup norm $\|f\| = \sup_{x\in[a,b]} f(x)$. Define a functional $I : C[a,b] \to R$ by

$$I(f) = \int_a^b f(t)dt$$

- Show that $I(f)$ is linear functional.
- Also prove that $I(f)$ is bounded and $\| I \| = b - a$.

(d) For any two elements x, y of an inner product space V, prove that

$$\|x+y\|^2 + \|x-y\|^2 = 2\|x\|^2 + 2\|y\|^2$$

(e) let A be a non-empty complete convex subset of an inner product space V, and $x \in V \setminus A$. Show that there is unique $y \in A$ such that $\| x-y \| = \inf_{\acute{y}\in A} \| x-\acute{y} \|$.

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

Roll No. .....

Paper: Ordinary Differential Equations **Course Code: MATH-312** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following **(5x6=30)**

1. State and prove Lagrange's Identity.
2. Find the solution in the form of power series in x of the following differential equation

$$\frac{d^2y}{dx^2} - xy = 0.$$

3. Show that $\int_{-1}^{1} [P_k(x)]^2 \, dx = \frac{2}{2k+1}$
4. Prove the identity $J_{-m}(x) = (-1)^m J_m(x)$, where m is positive integer.
5. Define Hypergeometric functions. Prove that

$$F_{21}(\alpha, \beta; \gamma; z) = \frac{\Gamma(\gamma)}{\Gamma(\gamma-\alpha)\Gamma(\alpha)} \int_0^1 t^{\alpha-1} (1-t)^{\gamma-\alpha-1} (1-tz)^{-\beta} \, dt$$

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

1. Find the eigen values and eigen functions for the regular Sturm-Liouville System

$$y'' + \lambda y = 0, \quad y(0) = 0, \quad y'(1) = 0.$$

2. Use the method of Frobenius to find a series solution in x of the differential equation

$$2x\frac{d^2y}{dx^2} + \frac{dy}{dx} - y = 0$$

3. Discuss the orthogonality relation for Bessel functions.

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

Roll No. .....

Paper: Quantum Mechanics-I **Course Code: PHYS-3301** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. Prove that eigen value of Hermitian operator is real.

ii. Define wave function. What are properties of a wave function?

iii. Find out if the function $\Psi(x) = e^{ax}$ is an eigen function of x-component of momentum operator.

iv. Consider two states

$$|\Psi_1> = 2i\,|\phi_1> + |\phi_2> - \alpha\,|\phi_3> + 4|\phi_4>$$

$$|\Psi_2> = 3\,|\phi_1> - i|\phi_2> + 5\,|\phi_3> - |\phi_4>$$

Where $|\phi_1>, |\phi_2>, |\phi_3>$ and $|\phi_4>$ are orthonormal kets and is α constant . Find the value of α, if $|\Psi_1>$ *and* $|\Psi_2>$ are orthogonal.

v. What is physical significance of Hamiltonian in Quantum Mechanics?

vi. Define complementary and correspondence principles.

vii. Write down physical significance of ladder operators in Quantum mechanics.

viii. In case of orbital momentum operator, can $\hat{L}^2$ and $\hat{L}_z$ both be simultaneously measured? Explain the reason.

ix. Compute $[\hat{S}_z, \hat{S}_x]$=?

x. Prove That $\hat{a}|n> = \sqrt{n}\,|n-1>$. Where $\hat{a}$ is annihilation operator.

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

(i)-State and prove generalized uncertainty relation (Uncertainty principle for operators).

(ii)-Differential equation for simple harmonic oscillator obtained after solving Schrodinger wave equation is given by,

$$H''(z) - 2zH'(z) + (\lambda - 1)H(z) = 0$$

Solve this equation to find energy eigen values and wave functions of simple harmonic oscillator.

(iii)-Discuss the significance of ladder operators $\hat{L}_{\pm}$. Show that they have following property:

$$\hat{L}_+\psi(l,m) = \sqrt{l(l+1) - m(m+1)}\hbar\psi(l,m+1)$$

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

Roll No. .....

Paper: Solid State Physics-II **Course Code: PHYS-3402** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i) Give example to generate and print values of two vectors x & y. Also draw graphs of x vs y using stem(), bar() and plot().

ii) Write example to show the function of the following.

(a) max() (b) ones() (c) length() (d) mean() and (e) std()

iii) If t =[0 2π], s1=sin(x) & s2= cos(x), Write code to plot t vs s1, t vs sum of s1 & s2, t vs mean of s1 & s2 and find maximum of s2.

iv) Create a vector y with values 1 to 100 having increment 2. Find sum of y, plot y and print y in reverse order.

v) To calculate by a function the area and circumference of a circle by taking the values of radius from the user

vi) Write one example to show the use of: roots(), diff(), rand(), and polyval()

Answer the following questions.

Q2. Derive an expression for intrinsic charge concentration in semi-conductors. Prove that $\epsilon_f = \epsilon_g/2$. (8+2)

Q3. Solve the Schrodinger equation for the following case

$$\left.\begin{array}{ll} V(x) = 0 & 0 < x < a \\ V(x) = V_\circ & -b < x < 0 \end{array}\right]$$

Discuss formation of allowed and forbidden energy bands on the basis of the above results. Also discuss the conditions whether an energy level is discrete or continuous. (10)

Q4. (a) What is meant by effective mass of an electron? Discuss the conditions when it becomes positive, negative and infinite.

(b) What are holes and enlist its various properties as vacant orbitals in semiconductor. (6+4)

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

Roll No. .....

Paper: Mathematical Methods of Physics-II **Course Code: PHYS-3503** Time: 3 Hrs. Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following: **(6x5=30)**

1. Find the transformation matrix L corresponding to a rotation of the coordinate axes through an angle θ about the $\mathbf{e}_3$-axis (or x_3-axis).
2. Show that the process of contraction of an N-th order tensor produces another tensor, of order $N-2$.
3. Show that $\epsilon_{ijk}\epsilon_{ijk} = 6$.
4. Calculate the elements g_{ij} of the metric tensor for cylindrical polar coordinates. $(x = \rho\cos\phi, y = \rho\sin\phi, z = z)$
5. Show that $\frac{\partial \mathbf{e}^i}{\partial u^j} = -\Gamma^i_{kj}\mathbf{e}^k$.
6. Show whether the following functions are analytic or not

$$f(z) = z^2, \quad f(z) = \bar{z}.$$

Q.2. Solve the following. **(5x6=30)**

1. Show that the quantities $g^{ij} = \mathbf{e}^i.\mathbf{e}^j$ form the contravariant components of a second-order tensor.
2. Evaluate $\int_0^{2\pi} \frac{1}{(2+\cos\theta)^2} d\theta$.
3. Show that the group of four elements $\{1, i, -1, -i\}$ under ordinary multiplication of complex numbers.
4. By using the Cauchy's integral formula, evaluate $\oint_C \frac{\sin^2(z)}{(z-a)^4} dz$, where the integral is counterclockwise on a contour that encircles the point $z = a$.
5. Show that the covariant derivative of a vector $\mathbf{v}$ is given by $\frac{\partial \mathbf{v}}{\partial u^j} = v^i_{;j}\mathbf{e}_i$ where $v^i_{;j} = \frac{\partial v^i}{u^j} + \Gamma^i_{kj}v^k$.

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

Roll No. .....

Paper: Computational Physics-II **Course Code: PHYS-3504** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i) Give example to generate and print values of two vectors x & y. Also draw graphs of x vs y using stem(), bar() and plot().
ii) Write example to show the function of the following.
(a) max() (b) ones() (c) length() (d) mean() and (e) std()
iii) If $t = [0\ 2\pi]$, $s1 = \sin(x)$ & $s2 = \cos(x)$, Write code to plot t vs s1, t vs sum of s1 & s2, t vs mean of s1 & s2 and find maximum of s2.
iv) Create a vector y with values 1 to 100 having increment 2. Find sum of y, plot y and print y in reverse order.
v) To calculate by a function the area and circumference of a circle by taking the values of radius from the user
vi) Write one example to show the use of: roots(), diff(), rand(), and polyval()

Answer the following questions. (3x10=30)

Q.2.	How randomly generated points can be used to show Brownian motion? Write MATLAB program to simulate Brownian motion of an object for 31 collisions. Plot estimate graph. Write a program to find out factor of a number. Write MATLAB program to evaluate $\int_1^6 (3\sqrt{x} - 0.5)dx$.
Q.3.	Suppose **A** be a **3x3** matrix. Write **MATLAB** program which reads in random numbers as entries of the matrix **A** and calculate (i) sum and average of the all matrix elements, (ii) transpose of the matrix A (also plot the matrix), (iii) also check whether the Matrix A is an identity matrix? (iv) sort the matrix elements, (v) divide matrix rows by its row average. Write program to study the damped harmonic motion (DHM) of a mass attached with a spring using Euler's method with: (g=9.8 m/s^2, initial position zero and velocity 15 m/s, time step 0.1 sec. and tmax 15 sec., k = 1 N/m, m=1kg, damping coefficient = 0.5 N/ms,). Print and plot values for time, position, velocity and acceleration. Also suggest changes to write program for Simple harmonic motion.
Q.4.	Write MATLAB program to plot and print time, position, velocity and acceleration values for a spherical object in air drag. The acceleration and other parameters are given by $\mathbf{a = g - k v^2}$ where $\mathbf{k = c \pi \rho r^2 / 2 m}$ with the conditions: $\mathbf{g = 9.8\ m/sec^2}$, **c=0.46** (drag constant), $\boldsymbol{\rho}$**= 1.2 kg/m^3, r=1m, v=0 m/sec, h= 0.1 sec** and **tmax=2.5sec.** Write code to solve for the system of equations for x, y and z by using two different methods.Such that 2x+y+2z =17, 4x-3y+8z=6 and x-3y+z=6.

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

Roll No. .....

Paper: Electronics-II **Course Code: PHYS-3702** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. Define Excess-3 code with example.
ii. Convert $(00111010)_2$ to hexadecimal.
iii. Convert $(798)_8$ to binary.
iv. Is NOR gate associative or not?
v. Convert $(011010111101)_2$ into gray code.
vi. Differentiate between amplifier and oscillator.
vii. Name the two types of oscillators.
viii. How does the Class AB amplifier differ from a Class B amplifier?
ix. Convert the given expression into standard form.
$X= AB+ABD+BCD$
x. What are two types of clipping in class A amplifier?

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

I. Analyze the bipolar junction transistor amplifier for total low frequency response.
a. Determine the lower critical frequency and phase shift of input RC circuit.
b. Determine the lower critical frequency and phase shift of output RC circuit.
c. Determine the lower critical frequency of bypass RC circuit.
d. Describe a Bode plot.

II. Briefly discuss the ways to connect negative feedback with operational amplifier. What are the benefits of negative feedback in operational amplifiers?

III. What is oscillator? Discuss working principle of oscillator.

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

Roll No. .....

Paper: Western Political Philosophy-II **Course Code: POL-306** **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. Define Machiavelli's concept of political power.
2. What is Hobbes' view on the state of nature?
3. Summarize Locke's theory of natural rights.
4. Explain Rousseau's idea of the general will.
5. What are the key principles of J.S. Mill's concept of liberty?

Q.2. Answer the following questions. (2x15=30)

1. Analyze the political philosophy of Hobbes and Locke, focusing on their perspectives on the social contract.
2. Discuss Bentham's utilitarianism and its influence on modern political thought.

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

Roll No. .....

Paper: Muslim Political Philosophy-II **Course Code: POL-307** **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 نمبر1: درج ذیل سوالات کے مختصر جوابات تحریر کریں۔

i. Write Iqbal's concept of Khudi.

i. اقبال کے تصورِ خودی کو بیان کریں۔

ii. Describe the concept of Modernity by Muhammad Abdhu.

ii. محمد عبدہٗ کا تصور جدیدیت لکھیں۔

iii. Write a note on the life of Syed Qutab.

iii. سید قطب کی زندگی پر نوٹ تحریر کری۔

iv. Write a note on the philosophy of Jamaludin Anghani.

iv. جمال الدین افغانی کے فلسفہ پر نوٹ لکھیں۔

v. What is political Islam according to Hasan Al-Turabi?

v. حسن الترابی کا سیاسی اسلام سے کیا مراد ہے؟

vi. Write a note on the political philosophy of Ayatollah Imam Khumenei.

vi. آیت اللہ امام خمینی کے سیاسی فلسفے پر نوٹ تحریر کریں۔

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

سوال نمبر2: درج ذیل سوالات کے تفصیلی جوابات تحریر کریں۔

i. Why is Iqbal called Poet of the East?

i. اقبال شاعرِ مشرق کیوں کہلاتے ہیں؟

ii. Write an essay on the concept of Muslim Brotherhood by Syed Qutab.

ii. سید قطب کے تصور مسلم بھائی چارہ پر مضمون لکھیں۔

iii. Explain the rights of non-Muslims according to Molana Abdul ala Modudi.

ii. مولانا ابوالاعلیٰ مودودی کے مطابق غیر مسلمون کے حقوق کی وضاحت کریں۔

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

Roll No. .....

Paper: Comparative and Developmental Politics-II

Course Code: POL-308

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 the concept of political modernization.
2. Just highlights five hurdles in the process of Political Development.
3. Write five qualities of Charismatic leadership.
4. Elaborate the concept of Legitimacy.
5. What is meant by Socio- Political change.
6. Explain the Bureaucracy.

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

1. Define Political Development and describe it's characteristics.
2. What is the role of Army in Government and politics of developing countries .
3. What measures do you suggest for National Integration? Explain .

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

Roll No. .....

Paper: History of International Relations **Course Code: POL-309** **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. Explain Truman Doctrine. How did Truman Doctrine contribute to Cold War?
2. Define Nuclear Proliferation.
3. Define Terrorism. Write any two measures to counter terrorism in contemporary world.
4. Briefly explain any two main events during Cold War.
5. What was the immediate cause of World War I?

Q.2. Answer the following questions. (2x15=30)

1. Highlight the causes of Second World War.
2. Collapse of Soviet Union was inevitable. Comment.

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

Roll No. .....

Paper: Enterprise Systems **Course Code: SI-342** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

1) What is Data set?
2) What is data adapter?
3) What is the purpose of Get and Post request in Ajax?
4) Write difference between Xml and ADO.net.
5) What is the use of WSDL?
6) What are JQuery Selectors? Define **.class** selector in JQuery.

Q.2. Answer the following questions. (2x15=30)

1. Define the basic syntax of JavaScript. Write a program in JavaScript to convert the temperature from Fahrenheit to Celsius using functions.
2. What is SOAP? Explain the following terms related to SOAP:
   - Soap Envelop
   - Soap Header
   - Soap Body
   - Soap Fault

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

Roll No. .....

Paper: Advanced Experimental Design (Theory)
Course Code: STAT-310

Marks: 60

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write a short note on the following. (6x5=30)

I. Factorial Experiments
II. Fractional replication
III. Confounding
IV. Design resolution
V. Youdon Square
VI. PBIBD

Answer the following questions. (3x10=30)

Q2. A chemical product is produced in a factorial design. Experiment was carried out to study the four factors A, B, C and D. Each factor is present at two levels and data obtained from single replicate are shown below. Analyze the data.

	A_0				A_1			
	B_0		B_1		B_0		B_1	
	C_0	C_1	C_0	C_1	C_0	C_1	C_0	C_1
D_0	45	68	48	80	71	60	65	65
D_1	43	75	45	70	100	80	104	96

Q3. Data on screen color difference on a television tube measured in degrees Kelvin are to be compared for four operators. On a given day only three operators can be used in the experiment. A balanced incomplete block design gave results as follows:

Operators	Monday	Tuesday	Wednesday	Thursday
A	173	174	----	171
B	-----	175	167	172
C	183	175	168	------
D	175	-------	172	175

Do a complete analysis of these data and discuss our findings with regard to difference between operators.

Q4. Consider the following partially balanced Incomplete Block design (PBIBD)

Blocks					
I	II	III	IV	V	VI
1	3	2	1	3	1
2	4	5	2	4	5
3	5	6	4	6	6

Verify:

(i) $p_{11}^1 + p_{12}^2 = n_1$
(ii) $p_{11}^1 + p_{12}^1 = n_1 - 1$
(iii) $n_1 p_{12}^1 = n_2 p_{11}^2$
(iv) $n_1 p_{22}^1 = n_2 p_{12}^2$
(v) $p_{21}^2 + p_{22}^2 = n_2 - 1$
(vi) $n_1 + n_2 = a - 1$
(vii) $n_1\lambda_1 + n_2\lambda_2 = r(k-1)$
(viii) $p_{21}^1 + p_{22}^1 = n_2$

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Advanced Sampling Techniques (Theory)
Course Code: STAT-312

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 Ratio and Regression estimates how they are different from Simple Random sampling estimates.

II. Describe Separate Ratio estimator and its requirements.

III. Write a brief note on Bias of Regression estimator and its role in sampling.

IV. Discuss Combined regression estimators and their requirements.

V. What is the Role of Optimum Cluster size in cluster sampling.

VI. Define Multistage Sampling.

Answer the following questions. (3x10=30)

Q. 2. Show that to the first order of approximation

$$V(\bar{y}_R)=\frac{1-f}{n}\left(S_y^2+R^2S_x^2-2RS_{xy}\right)$$

Q. 3. For Simple random sample, with n large enough so that sampling error in the sample Regression coefficient negligible. Show that an unbiased estimator of $V(\bar{y}_{l_r})$ from the sample is

$$v(\bar{y}_{l_r})=\frac{N-n}{Nn(n-1)}\sum_{i=1}^{n}\left[(y_i-\bar{y})-b(x_i-\bar{x})\right]^2.$$

Q. 4. In sample random sampling, WOR, of 'n' clusters each containing M elements from population of N clusters. Show that $\bar{\bar{y}}$ is an unbiased estimator of $\bar{\bar{Y}}$ with

$$V(\bar{\bar{y}})=\frac{1-f}{n}\frac{NM-1}{M^2(N-1)}S^2\left[1+(M-1)\rho\right].$$

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Probability Distributions (Theory) **Course Code: STAT-316** **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) Find mean and variance of Exponential distribution.

ii) If X has Standard Normal distribution. Find the distribution of $Y=X^2$.

iii) Derive the limiting form of t-distribution.

iv) Find the m.g.f of a random variable X having the p.d.f.

$$f(x) = \frac{x}{2} \qquad 0 \le x \le 2$$

Using this m.g.f., find the first four moments about the origin.

v) Find the mean and variance of rectangular distribution on (-2, +2).

vi) Show that area under curve of Bivariate normal distribution is unity.

Answer the following questions. (3x10=30)

Q2 Derive the p.d.f of F-distribution.

Q3 If the joint p.d.f of X and Y is given by

$$f(x) = \begin{cases} \frac{1}{4}(2x+y) & 0 < x < 1 \\ 0 & 0 < y < 2 \end{cases}$$

Find the marginal p.d.f's of X and Y. Also, find the conditional p.d.f. of X given $Y = y$, and use it to evaluate $P\left(X \le \frac{1}{2} \middle/ Y = \frac{1}{2}\right)$.

Q4 Show that in a sample of 'n' observations from $f(x) = e^{-x}, \quad x > 0$. The variance of smallest observation is $\frac{1}{n^2}$.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: FORTRAN Computer Language **Course Code: STAT-318** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

(a): What is an operating system. Explain main functions and features of an operating system.

(b): Write a FORTRAN program that reads the radius of a sphere and compute its volume and surface area.

(c): Write a FORTRAN expression for the following mathematical expressions.

1. $\left|\frac{\sqrt{x^3-y^3-z^3}}{\cos(a+b)}\right|$
2. $e^{|x-y|} - x^4$
3. $\frac{sin^2(\pi+x)+\tan(\frac{3\pi}{2}+x)}{\cot^2(\frac{3\pi}{2}-x)\,cos^2(\pi-x)}$
4. $\sin^{-1}(a\sqrt{1-b^2} + b\sqrt{1-a^2})$
5. $a + \frac{b}{|x^2-y^2|}$

(d): Write an FTN program to print even and odd numbers.

(e): Write a FORTRAN program to find the sum of $(1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4}, \ldots, + \frac{1}{100})$

(f): Write a program that calculates the mean and variance of X values by using array.

Answer the following questions. (3x10=30)

Q.2 What is an array? Also, explain declaration of different types of arrays with examples in FORTRAN.

Q.3

Write a FORTRAN program to find the sum of the following series.

a. $(\frac{2}{3} + \frac{4}{5} + \frac{6}{7}, \ldots, + \frac{2N}{2N+1})$

b. $(1 - \frac{3}{2^2} + \frac{5}{3^2} - \frac{7}{4^2}, + \cdots, + \frac{2N-1}{N^2})$

Q.4

Write a FORTRAN program to find the sum and product of two matrices A(R×C) and B(R×C).

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Advanced Computer Languages **Course Code: STAT-319** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write a short note on the following and explain by the help on an example: (6x5=30)

a) cat()
b) length()
c) is.na()
d) data.frame()
e) scan()
f) head()

Answer the following questions. (3x10=30)

Q2. Write a R code to generate the following vectors or to perform the given task:

a) Generate a random sample of 200 observations from a normal distribution with mean= 10 and var=1.
b) Calculate the mean and biased variance of generated sample
c) Print the sample mean and sample variance
d) Plot the histogram of sample data
e) Calculate the first four moments about the mean and print the results

Q3. Write an R code to solve the following system of linear equations and report results:

$$22x+47y+29z=23$$

$$89x-60y+89z=50$$

$$70x+5y+89z=89$$

Q4. Given the following data. Write R code to do the following tasks:

X1	13	11	10	16
X2	15	13	18	12
X3	17	15	14	19

a) Apply one way anova to test the equality of means. Extract the test statistics value and p value from the test results.

b) Apply kruskal- wallis test to test the equality of averages. Extract the test statistics value and p value from the test results.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Subject: Principles of Management **Paper: UE-272** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Write short note on the following: **(6x5=30)**

I. Formal vs informal communication.

II. Difference between theory and practice.

III. Transformational leadership.

IV. Omnipotent view

V. Differentiate between theory x and theory y in motivation.

VI. Behavioral theory of leadership

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

Q.No.2: Define the process of Controlling. Explain the various Techniques of Controlling.

Q.No.3: Explain the Maslow's hierarchy of need theory.

Q.No.4: Explain the various functions and skills of Management.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Urdu Afsaana aur Drama: Fiqri o Funny Mutaila

Course Code: URDU-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۔

سوال نمبر 1: درج ذیل سوالات کے مختصر جواب تحریر کریں۔ **(6X5=30)**

(۱) آغا حشر کے ڈرامے ''رستم وسہراب'' کا مرکزی خیال کیا ہے؟

(۲) ممتاز مفتی کے افسانوں پر کس ماہر نفسیات کے اثرات محسوس ہوتے ہیں؟

(۳) سجاد حیدر یلدرم کے افسانوں کی نمایاں خصوصیات کیا ہیں؟

(۴) غلام عباس کے افسانے ''اوور کوٹ'' کا مرکزی خیال بیان کیجیے۔

(۵) پریم چند کے افسانے ''کفن'' کا مرکزی خیال بیان کیجیے۔

(۶) راجندر سنگھ بیدی کے پانچ افسانوں کے نام لکھیں۔

سوال نمبر 2: درج ذیل سوالات کے جواب تحریر کریں۔ **(3X10=30)**

1. پریم چند کے افسانوں کی نمایاں خصوصیات بیان کیجیے۔
2. ''انارکلی'' کس کردار کا المیہ ہے۔ اظہارِ خیال کیجیے۔
3. غلام عباس کے افسانوں میں پائے جانے والے سماجی شعور کے حوالے سے اظہارِ خیال کیجیے۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: 20th Saadi may Nawal ka Irtaka, aur es kay Fiqri o Funny Mubahas
Course Code: URDU-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 نمبر1: درج ذیل سوالات کے مختصر جواب دیں۔ **(6x5=30)**

ا۔ 'اداس نسلیں' کے کردار عذرا کا تجزیہ کیجیے۔
ب۔ اداس نسلیں کی کہانی اپنے لفظوں میں بیان کریں۔
ج۔ خدا کی بستی کے کسی کردار کا تجزیہ پیش کریں۔
د۔ شوکت صدیقی اپنے ناول میں کس طبقے سے ہمدردی رکھتے ہیں؟ اپنی رائے مثالوں سے پیش کریں۔
ہ۔ راجہ گدھ کے کردار قیوم پر تبصرہ کیجیے۔
و۔ راجہ گدھ کے پلاٹ کا تجزیہ کیجیے۔

سوال نمبر2: درج ذیل سوالات کے تفصیلی جواب دیں۔ **(3x10=30)**

ا۔ 'آخرِ شب کے ہم سفر' میں ایک بڑے ناول کی صفات پائی جاتی ہیں، اپنے تجزیے سے ثابت کیجیے۔
ب۔ 'آنگن' کے کرداروں کا تجزیہ کیجیے۔
ج۔ 'آنگن' کا سیاسی و سماجی تجزیہ پیش کریں۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Urdu Nazam: Fiqri o Funny Mutaila **Course Code: URDU-306** **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 ا: درج ذیل سوالات کے مختصر جواب دیں۔ **(6x5=30)**

1. درج ذیل اشعار کی تشریح کریں۔

شاہا تیرے جلوے سے ہے یہ عید کو رونق — عالم نے تجھے دیکھ کے ہے عید منائی

کہتے ہیں مہ نو جسے، ابرو نے وہ تیری — کہ آئینہ چرخ میں ہے جلوہ نمائی

2. قصیدہ کی تعریف لکھیے نیز اس کے بنیادی ارکان کے نام لکھیے۔
3. شہر آشوب کی تعریف لکھیے۔ نیز شامل نصاب شہر آشوب کا عنوان تحریر کیجئے۔
4. راشد کی نظم "اندھا کباڑی" کا تعارف کروایئے۔
5. فیض کی نظم "نثار میں تیری گلیوں کے" کا موضوعاتی جائزہ لیجئے۔
6. میرا جی کی نظم "دور کنارہ" کا مرکزی خیال بیان کیجئے۔

درج ذیل سوالات کے تفصیلی جواب دیں۔ **(3x10=30)**

1 شامل نصاب متن کے مناظر مین مثنوی سحر البیان کا تفصیلی تعارف کروائیں۔

2. اردو قصیدے کی روایت میں ذوق کے مقام مرتبے کا تعین کریں۔
3. سید محمد جعفری کی نظم "کھڑا ڈنر" ہمارے کس سماجی رویے پر طنز ہے۔ نوٹ لکھیں۔

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Research Methodology **Course Code: ZOOL-308** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. Objectives of research
ii. Problems of research in Pakistan
iii. Sampling requirements
iv. t-test
v. Plagiarism
vi. Bibliography

Answer the following questions. (3x10=30)

Q.2 Write a detailed note on cost estimation for research project.

Q.3 Explain the steps of research design with suitable examples.

Q.4 Give a comprehensive note on parts of synopsis.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Principles of Systematics **Course Code: ZOOL-309** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. Define SUBSPECIES.
ii. Differentiate TAXONOMY and SYSTEMATICS.
iii. Define TAXONOMIC CATAGORIES.
iv. Differentiate between HOMONYM AND SYNONYMS.
v. Describe problems of EVOLUTIONARY species concept.
vi. Define TYPE METHOD.
vii. Describe PROBLEMS related with ZOOLOGICAL NOMENCLATURE.
viii. What is PHENON?
ix. What is VALID NAME of a Taxon?
x. Define TYPE METHOD.
xi. Define SHARED DERIVED characters.
xii. Differentiate between BINOMIAL and TRINOMIAL NOMENCLATURE.
xiii. Which are prerequisites for taxonomic collection?
xiv. Differentiate between MONOPHYLY and POLYPHYLY.
xv. Differentiate between UPWARD and DOWNWARD classification.

Answer the following questions. (3x10=30)

Q2. Discus WEIGHTING OF TAXONOMIC CHARACTERS. Describe types of characters that have high and low weightage in classification .

Q3. Describe DIFFERENT MODES OF SPECIATION in detail.

Q4. Compare PHYLOGENETIC and CLADISTIC CLASSIFICATION in detail.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Molecular Genetics II **Course Code: ZOOL-310** **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. Differentiate between thymine and uracil with the help of chemical structures?

II. What is nucleosome? Describe structure of nucleosome.

III. What is the mechanism of transposition of DNA transposons?.

IV. What are Cis-acting elements? Give two examples of Cis-acting elements?

V. What are Shine-Dalgarno Sequences?

VI. What is immunoblotting? Describe role of immunoblotting in molecular genetics?

Answer the following questions. (3x10=30)

Q.2: What is Lac Operon? Describe regulation of Lac operon in the presence and absence of glucose and lactose?

Q.3: Describe various techniques to screen recombinant bacteria?

Q.4: Write a comprehensive note on Gene Therapy?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Developmental Biology **Course Code: ZOOL-310A** **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. Differentiate between **spermatogenesis and Spermiogenesis**?

II. Enlist **Hormones** involved in ovarian cycle with functions, in humans.

III. Describe **Morphogenetic movements** with examples.

IV. Explain multiple **roles of β- catenin** during development.

V. Draw a labelled **fate map** of Xenopus laevis.

VI. Give advantages and disadvantages of **IVF**

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

1. Describe the development of gonads in mammals.
2. Write a note on differential cell affinity emphasizing on cadherins as cell adhesion molecules.
3. write a comprehensive note on variations in patterns of cleavage with respect to the amount and distribution of yolk in the animals' eggs.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Genetics **Course Code: ZOOL-311A** **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 Bombay phenotype? How does Bombay blood group differ from Blood group O on genetic basis?

II. What is Operon? Describe the regulation of Lac Operon in the presence of glucose and lactose?

III. What is testicular feminization syndrome? Describe genetic basis of this syndrome.

IV. Is it possible to produce a Himalayan rabbit by making a cross between Agouti and Chinchilla rabbit?

V. What is sexduction? How does sexduction differ from HFR conjugation?

VI. Write down formula for calculating genotype frequency and allele frequency.

Answer the following questions. (3x10=30)

Q.2: Differentiate between Euploidy and Aneuploidy with examples.

Q.3: Describe genetic basis of antibody diversity.

Q.4: Write a note on the following

A: Chromosomal theory of Inheritance B: Jumping Genes

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Wildlife **Course Code: ZOOL-312A** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. What is Edge Species and ecotone?

ii. What is difference in Taming and Homing?

iii. What is difference in sterility and Fecundity?

iv. Write note on carrying capacity?

v. Differentiate between Flagship species and Umbrella Species?

vi. Write note on the following Animals?

A). Snow Leopard **B).** Markhor **C).** Houbara Bustard

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

1. Write a note on protected areas of Punjab wildlife provincial act.
2. Write a detailed note on biodiversity and sustainability of wildlife.
3. What are wetlands and explain Ramsar Criteria and give examples of Ramsar Sites in Pakistan.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Wildlife **Course Code: ZOOL-314** **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. Write a short note on IUCN Categories?

ii. What are major threats to wetlands?

iii. Write detail note on In-Situ Conservation and explain how it is advantageous?

iv. Differentiate Crepuscular and nocturnal?

v. Define Adaptations with example?

vi. Write note on the following Animals?

A). Houbara Bustard **B).** Brown Bear **C).** Urial

Answer the following questions. (3x10=30)

Question.2 Write a note on upkeep and health care of animals in a zoo

Question.3 Discuss in detail Ramsar Convention?

Question.4 Define National Parks and describe any three national parks of Pakistan in detail?

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Environmental Biology **Course Code: ZOOL-316** **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 describe the mechanisms of succession.
ii. Differentiate between primary and secondary pollutants with examples.
iii. Define noise pollution and mention its significant effects on human health.
iv. What are the major causes of water pollution?
v. What is population dynamics, and why is it important in population ecology?
vi. Differentiate between geometric growth and exponential growth in populations

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

1) Explain the mechanism of succession and its relationship with community and ecosystem stability.
2) Discuss the sources and types of air pollution, including primary and secondary pollutants. Explain the effects of air pollution on human health and the environment.

UNIVERSITY OF THE PUNJAB

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

Roll No. .....

Paper: Animal Behavior **Course Code: ZOOL-318** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

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

i. What is comparative psychology?
ii. What is sexual conflict?
iii. What is action potential?
iv. What are territorial birds?
v. What is polyandry?
vi. What is social communication?
vii. What is Negative feedback system?
viii. What is Fisher Law?
ix. How group foraging is beneficial?
x. What are cognitive maps?
xi. What is classical conditioning?
xii. What is aggression?
xiii. What is imprinting?
xiv. What is optimal foraging?
xv. What are pseudomorphs?

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

i. What are the challenges and benefits of Migration?
ii. What are alarm calls? Discuss in detail?
iii. Give a detailed account of Optimal foraging behavior?