



UNIVERSITY OF THE PUNJAB

Fourth Semester – 2018

Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Botany-IV (Plant Physiology & Ecology)
PAPER CODE: BOT-007

MAX. TIME: 30 Min.
MAX. MARKS: 10

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Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Division of marks is given in front of each question.

This Paper will be collected back after expiry of time limit mentioned above.

- (i) Which of the following process produce O_2
A. Transpiration B. Photosynthesis C. Osmosis D. Diffusion
- (ii) The pigment involve in photosynthesis is
A. Cytochrome B. Chlorophyll. C. Phytochrome D. Carotenoid
- (iii) Which of the following mineral deficiency causes leaves purple coloration, stunted growth & delay in plant development
A. Potassium B. Calcium C. Phosphorus. D. Sulphur
- (iv) Most of the ATP made during cellular respiration is generated by
A. Photophosphorylation B. Glycolysis. C. Phosphorylation
D. Oxidative phosphorylation E. Substrate level phosphorylation .
- (v) Energy that is released from glucose during respiration but not transferred to ATP bond can be detected by
A. CO_2 B. Heat C. H_2O D. ADP
- (vi) The Symbiotic relationship between Rhizobium & root nodule fix the
A. Atmospheric CO_2 B. Atmospheric Nitrogen C. O_2 D. CFC
- (vii) Ecotype is a type of species in which environmentally induced variation are
A Permanent B. Temporary
C. Genetically fixed D. Genetically not related
- (viii) Energy flow in an Ecosystem is
A. Unidirectional B. Bidirectional
C. Multidirectional. D. Without directional
- (ix) Hygrometer is the instrument used for measurement of
A. Water density B. Humidity C. Precipitation D. pH
- (x) Interaction between biotic and abiotic factor is an example of
A. Environment B. Ecological niche C. Ecosystem D. Biotype



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Note: All questions are Compulsory. Draw diagrams where necessary

Section-II

(4x5= 20 Marks)

- Q.1 Describe Respiration. Define Aerobic and Anaerobic Respiration.
- Q.2 Differentiate between Epinasty and Hyponasty with example.
- Q.3 Describe Krebs cycle. Define steps of reaction with products.
- Q.4 Describe Photosynthesis. Define factors affecting rate of Photosynthesis.
- Q.5 Write short notes on any two of the following
- (i) Indole acetic acid (ii) Geotropism (iii) ATP & ADP

Section-III

(10x3=30 Marks)

- Q.1. Define Succession and its types.
- Q.2 What do you mean by Abiotic factors? Define factors that may have effects on environment.
- Q.3 Define an Ecosystem of pond? Highlight factors helps in balance life



UNIVERSITY OF THE PUNJAB
Fourth Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Chemistry-IV (General Chemistry)
PAPER CODE: CHEM-007

MAX. TIME: 30 Min.
MAX. MARKS: 10

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(SECTION-A)

Q.1. MCQs

(1x10=10)

1. Cannizzaro's reaction is not given by
(a) Formaldehyde (b) Acetaldehyde
(c) Benzaldehyde (d) Trimethylacetaldehyde
2. Acetone reacts with HCN to form cyanohydrins. It is an example of
(a) Electrophilic addition (b) Electrophilic substitution
(c) Nucleophilic addition (d) Nucleophilic substitution
3. Ketones are prepared by the oxidation of
(a) Primary alcohol (b) Secondary alcohol
(c) Tertiary alcohol (d) none of these
4. Aldehydes are the oxidation product of
(a) Pri- alcohol (b) sec- alcohol
(c) ter- alcohol (d) carboxylic acid
5. The reaction between caustic soda and fat is called
(a) Esterification (b) Hydrogenation
(c) Neutralization (d) Saponification
6. The reduction of a Ketones
(a) Always gives a primary alcohol (b) Always gives a secondary alcohol
(c) Always gives a carboxylic acid (d) Acetic acid and P_2O_5
7. Which is a strongest acid?
(a) CH_3COOH (b) $Cl_2CHCOOH$
(c) $ClCH_2COOH$ (d) Cl_3COOH
8. The number of electron involved in the reaction when a faraday of electricity is passes through an electrolyte in the solution is
(a) 6×10^{23} (b) 8×10^{16}
(c) 10×10^{46} (d) 96540
9. Purification of common salt by passing HCL gas is based on
(a) Solubility product principle (b) ionization
(c) Co-precipitation (d) common ion effect
10. The absorption of UV is the range of
(a) 200-400 nm (b) 400-800 nm
(c) 800-1600 nm (d) All are correct



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Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No.

Subject: Chemistry-IV (General Chemistry)
PAPER CODE: CHEM-007

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

(SECTION-B)

Q No. 2 Answer the following questions briefly (5x4=20)

1. Why the first few members of carboxylic acid are soluble and higher members are insoluble in water?
2. Why Aldehydes are more reactive than ketone for Nucleophilic reactions?
3. Write the mechanism of Cannizzaro's reaction?
4. Write down the postulates of Bohr's atomic model?
5. What do you mean by photoelectric effect? What is the concept of threshold frequency in photoelectric phenomenon?

(SECTION-C)

Q No.3 Answer the following questions (10x3=30)

1. Give the De-Broglie's equation for the dual nature of matter also apply the equation of de-Broglie's wavelength for microscopic and macroscopic particles?
2. Give the mechanism of aldol condensation in acidic as well as in basic media in detail by giving examples?
3. Give the concept of wavelength, frequency, wave number and energy of photon of light. How are they related with each other also define Beer-Lambert's law?



UNIVERSITY OF THE PUNJAB
Fourth Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

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Subject: Educational Leadership & Management
PAPER CODE: EDU-005

MAX. TIME: 30 Min.

MAX. MARKS: 10

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Q # 1: MCQs: choose the correct answer (1x10=10)

1. **Planning is which function of management**
 - a) Secondary
 - b) Primary
 - c) Essential
 - d) Significant

2. **Staffing refers to the**
 - (a) Number of people
 - (b) Assigning duties
 - (c) Provision of manpower
 - (d) Appraisal

3. **Leadership is responsible for**
 - (a) Inspiring
 - (b) Motivating
 - (c) Guiding
 - (d) All

4. **Financial management refers to**
 - (a) Administrative management
 - (b) Fiscal policy
 - (c) Effective and efficient money management
 - (d) Budgeting

5. **Learning is the process of bringing change in the**
 - (a) Existing knowledge
 - (b) Behavior
 - (c) Cognition
 - (d) all

P.T.O.

6. **Which one is not recognized key skill of Management**
- (a) Conceptual skill
 - (b) Human skill
 - (c) Technical skill
 - (d) Writing skill
7. **Decision making is less creative under which leadership style**
- (a) Autocratic
 - (b) Participative
 - (c) Charismatic
 - (d) Democratic
8. **Which theory of leadership assumes that people inherit certain qualities and traits that make them better suited to leadership?**
- (a) Trait theory
 - (b) Contingency theory
 - (c) Path goal Theory
 - (d) All
9. **Which function does not come under management process ?**
- (a) Planning
 - (b) Organizing
 - (c) Staffing
 - (d) Budgeting
10. **Which one is not the function of human resource management?**
- (a) Selection
 - (b) Training
 - (c) Assessment
 - (d) vision setting



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Subject: Educational Leadership & Management
PAPER CODE: EDU-005

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q NO. 2. Answer the following questions briefly (5 x4=20)

1. Define Management and Leadership
2. What is the contribution of code of ethics in teaching profession?
3. Define the role of controlling and Budgeting in organization of any event
4. Define Terms of references of various personnel s in the school
5. Differentiate Physical and Human resources

Q NO .3. Answer the following questions (3 x10 =30)

1. Give brief concept of Management. Explain various functions of Management with suitable examples.
2. Explain autocratic approach to school Management and discuss briefly advantages and disadvantages of autocratic approach.
3. Brief note on contingency theory of Leadership



UNIVERSITY OF THE PUNJAB
Fourth Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Educational Assessment & Evaluation
PAPER CODE: EDU-006

MAX. TIME: 30 Min.
MAX. MARKS: 10

.....
Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

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Q.1. MCQs

(1x10=10)

- i) ----- tests are used to predict future performance.
A) Achievement B) Aptitude C) Standardized
- ii) The main goal of ----- is to obtain valid, reliable and useful information concerning pupil achievement
A) Assessment B) Evaluation C) Testing
- iii) ----- items are considered comparatively more valid and reliable.
A) Matching B) True/false C) Multiple Choice
- iv) The ----- of a test item is indicated by the percentage of students who get the item right.
A) Difficulty B) Discrimination C) Usability
- v) ----- deals with numerical data.
A) Measurement & Evaluation B) Mathematics C) Statistics
- vi) ----- is a method of organizing data to simplify statistical analysis
A) Standard Deviation B) Frequency Distribution C) Range
- vii) The purpose of evaluation is to make -----
A) Prediction B) Opinion C) Judgement
- viii) The alternate name of Table of Specification is -----
A) Table of contents B) Test Blue Print- C) Test construction
- ix) The ability to organize, integrate and evaluate ideas is best reflected by-----
A) Extended Response items B) Restricted Response items
C) Matching items
- x) There is an absolute zero point in -----
A) Ordinal scale B) Interval scale C) Ratio scale



UNIVERSITY OF THE PUNJAB

Fourth Semester – 2018

Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No.

Subject: Educational Assessment & Evaluation
PAPER CODE: EDU-006

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q.No.2 - Answer the following questions. (5*4=20)

- i) - What is validity?
- ii) - Differentiate between formative and summative evaluation.
- iii) - What is Table of Specification?
- iv) - What are basic components of instructional objectives?
- v) - What is computer assisted instruction?

Attempt all the questions.

Q. No.3- Compare Standardized tests and Teacher made tests. (10)

Q.No.4- What is meant by Scales of Measurement? Explain the four main scales of measurement with examples. (10)

Q.No.5- Write short not on the following (5+5)

- i) Dynamic Assessment
- ii) Item Bank



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Roll No. in Fig.

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Subject: Islamic Studies / Ethics
PAPER CODE: ISE-001

MAX. TIME: 15 Min.

MAX. MARKS: 10

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سوال نمبر 1: خالی جگہوں کو مناسب الفاظ سے پر کریں (10)

1- سورہ --- کی پہلی --- آیات غار ثور میں نازل ہوئی۔

1- مدثر-6 2- علق-5 3- مزمل-4

2- آپ کی والدہ ماجدہ نے آپ کا نام --- رکھا۔

1- احمد 2- محمد 3- رسول اللہ

3- ہو "ضمیر" --- ہے۔

1- منفصل-2 متصل 3- اشاری

4- صلح حدیبیہ سنہ --- میں ہوا۔

1- 4 ہجری 2- 6 ہجری 3- 8 ہجری

5- قرآن کے معنی --- ہے؟

1- بہت زیادہ پڑھی جانے والی کتاب 2- سب سے زیادہ لکھی جانے والی کتاب 3- زیادہ طبع ہونے والی کتاب



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Roll No.

Subject: Islamic Studies / Ethics
PAPER CODE: ISE-001

MAX. TIME: 2 Hrs. 45 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

سوال نمبر 2: مندرجہ ذیل سوالات کے مختصر جواب دیجیے (5+5+5+5=20)

1: نصر سے فعل مضارع کی گردان لکھئے

2: معراج نبوی کے بارے میں لکھئے

3: اخلاق نبوی کے کوئی دو واقعات لکھئے

4: اسلام کے نظام عدل پر لکھئے

سوال نمبر 3: درج ذیل آیت کا ترجمہ و تشریح کریں (6+4=10)

لَقَدْ كَانَ لَكُمْ فِي رَسُولِ اللَّهِ أُسْوَةٌ حَسَنَةٌ لِّمَن كَانَ يَرْجُو اللَّهَ وَالْيَوْمَ الْآخِرَ وَذَكَرَ اللَّهَ كَثِيرًا

سوال نمبر 4: درج ذیل حدیث کا ترجمہ و تشریح کریں (6+4=10)

إِنَّمَا الْأَعْمَالُ بِالنِّيَّاتِ؛ وَإِنَّمَا لِكُلِّ امْرِئٍ مَا نَوَى

سوال نمبر 5: بیثاق مدینہ کی اہمیت پر نوٹ لکھیں (10)

Ethics (for Non-Muslims)

Q. 1. Answer the following questions in brief. (4x5=20)

1. Define the term Ethics in the perspective of religion.
2. What are the various concepts about Ethics?
3. What are good Ethics?
4. What are bad Ethics?
5. What are the concepts of Ethics in the Christianity?

Q.2. Explain the importance in individual human life. (10)

Q.3. Compare the ethical values in Hinduism, Christianity and Islam. (10)

Q.4. Write in detail about the followings: (5+5=10)

- Truthfulness
- Trustworthiness

Q. 5. Write about the concept of evil in different religions. (10)



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Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Mathematics B-IV (Metric Spaces & Group Theory) MAX. TIME: 30 Min.

PAPER CODE: MATH-008

MAX. MARKS: 10

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

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SECTION I

MCQ's (1×10= 10 Marks)

- If d_0 is a discrete metric space on \mathbb{R} , then $d_0(3,2) =$
 a). 0 b). 1 c). 2 d). 43
- The number of elements in group G is called _____ of G .
 a).order b).index c).cycle d). none
- If $A \cap \bar{B} = \phi \Rightarrow A \cap B =$ _____
 a) $\{2\}$ b). $\{1\}$ c). $\{0\}$ d). ϕ
- $[-1,1]$ is neighborhood of _____.
 a). -3 b). -2 c).0 d). 2
- $\min\{-1, |7 - 9|\} =$ _____.
 a). 1 b). -2 c). 2 d). 4
- $A \subseteq B \Rightarrow$ _____.
 a). $A^0 \subseteq B^0$ b). $B^0 \subseteq A^0$ c). $A^0 \cap B^0 = \phi$ d). ϕ
- If $I =]0,1]$ then $D(I) =$ _____.
 a). $[-1,1]$ b). $[0,1[$ c). $[0,1]$ d). $]0,1]$
- $N^d =$ _____.
 a). \mathbb{R} b). Q^c c). Q d). ϕ
- An element of group G is said to be idempotent if _____.
 a). $x^2 = x$ b). $x^3 = x$ c). $x^2 = -x$ d). $x^4 = x$
- $A^0 \cap F_r(A) =$ _____.
 a). ϕ b). A^c c). X d). A



Attempt this Paper on Separate Answer Sheet provided.

SECTION II

Short Questions (5×4=20 Marks)

1. Show that a subset of metric space is closed if and only if its complement is open.
2. Find all the subgroups of a cyclic group of order 18 generated by a.
3. Define with two examples
 - a) Cyclic group
 - b) Exterior point
 - c) Closed sets
 - d) Field.
4. If a group G has three elements, show that it is abelian.
5. If A and B are two subsets of a metric space X, then show that $(A \cap B)^d \subseteq A^d \cap B^d$.

SECTION III

Long Questions (3×10=30 Marks)

1. Let $C \setminus \{0\}$ be the group of all nonzero complex numbers under multiplication of complex numbers. Prove that the set $H = \{a + ib \in C \setminus \{0\} : a^2 + b^2 = 1\}$ is a subgroup of $C \setminus \{0\}$.
2. Show that $d(x, y) = d(x_1, x_2), d(y_1, y_2) = [(x_1 - y_1)^2 + (x_2 - y_2)^2]^{1/2}$ where $x_1, x_2, y_1, y_2 \in \mathbb{R}$ is a metric on \mathbb{R}^2 .
3. If a_1, a_2, a_3, \dots and b_1, b_2, b_3, \dots are arbitrary real numbers, then

$$\sqrt{\sum_{k=1}^n (a_k + b_k)^2} \leq \sqrt{\sum_{k=1}^n a_k^2} + \sqrt{\sum_{k=1}^n b_k^2}$$



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Roll No. in Fig.

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Subject: Mathematics A-IV (Ordinary Differential Equations)
PAPER CODE: MATH-007

MAX. TIME: 30 Min.
MAX. MARKS: 10

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Section-I (1× 10=10)

Q.1 Select appropriate option and encircled it.

- i The solution of differential equation $\frac{dy}{dx} = \sec^2 x$ is
 (a) $y = \cos x + c$ (b) $y = \tan x + c$ (c) $y = \sin x + c$ (d) $y = \cot x + c$
- ii The order of differential equation $\frac{d^2y}{dx^2} + x^2y = xe^x$ is
 (a) 4 (b) 3 (c) 2 (d) 1
- iii The solution of differential equation $\frac{dy}{dx} = \frac{1}{x \tan y}$:
 (a) $x \sin y = a$ (b) $x \cos y = a$ (c) $x \sin x = a$ (d) $x \cos x = a$
- iv $(x^2 + 3y^2)dx - 2xydy = 0$ is homogeneous differential equation of degree
 (a) 1 (b) 2 (c) 3 (d) 4
- v $(y^2 + 2xy)dx + x^2dy = 0$ is differential equation.
 (a) Linear (b) Exact (c) Homogeneous (d) None
- vi $x \frac{dy}{dx} + y = y^2 \ln x$ is differential equation
 (a) Homogeneous (b) Linear (c) Exact (d) None
- vii Roots of differential equation $(D^3 - 5D^2 + 7D - 3)y = 0$.
 (a) 1, 2, 3 (b) 1, 3, 4 (c) 1, 1, 3 (d) None
- viii The characteristics equation of $\frac{d^2y}{dx^2} + y = 0$.
 (a) $D+1 = 0$ (b) $D-1 = 0$ (c) $D^2 - 1 = 0$ (d) $D^2 + 1 = 0$
- ix The differential equation $M(x, y) dx + N(x, y) dy = 0$ is an exact D.E iff
 (a) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$ (b) $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$ (c) $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$ (d) None
- x $\frac{dy}{dx} + y = xy^3$ is differential equation.
 (a) Bernoulli (b) Linear (c) Exact (d) None



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Subject: Mathematics A-IV (Ordinary Differential Equations)
PAPER CODE: MATH-007

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Section-II (4×5=20)

Q.2

- i. Solve differential equation $(x^2 - 3y^2)dx + 2xydy = 0$.
- ii. Solve differential equations $x\frac{dy}{dx} + 2y = \sin x$.
- iii. Solve $(D^3 - 4D^2 + D + 6)y = 0$.
- iv. Solve $(D^2 - 3D + 2)y = e^x + e^{2x}$.
- v. Find an equation of orthogonal trajectories of the curve $x^2 + y^2 = cx$.

Section-III (10× 3=30)

Q.3 Solve initial value problem

$$(x^2 + 1)\frac{dy}{dx} + 4xy = x, \quad y(2) = 1.$$

Q.4 Solve Ricatti equation

$$\frac{dy}{dx} - y - \frac{2}{x^3}y^2 = -x^2, \text{ given that } y_1 = x^2 \text{ is a particular solution.}$$

Q.5 Solve $x^3\frac{d^3y}{dx^3} + 4x^2\frac{d^2y}{dx^2} - 5x\frac{dy}{dx} - 15y = x^4$.



UNIVERSITY OF THE PUNJAB
Fourth Semester – 2018
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Roll No. in Fig.

Roll No. in Words.

Subject: Physics-IV (Modern Physics)
PAPER CODE: PHY-007

MAX. TIME: 30 Min.
MAX. MARKS: 10

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SECTION – A **(1x10=10)**

Q.1 Encircle the most appropriate option.

- i. Which of the following does not travel with speed of light?
a) X- rays b) β - rays c) γ - rays d) infrared rays
- ii. A photon behaves as a particle if it has mass equal to
a) hc/λ b) hc/f c) hf/λ d) hf/c^2
- iii. X-rays were discovered by
a) Curie b) Rontgen c) Bohr d) Einstein
- iv. The excitation energy of hydrogen from $n = 1$ to $n = 2$ is
a) 10.2 eV b) 3.4 eV c) 13.6 eV d) 15.2 eV
- v. Which of the following is used as a moderator in nuclear reactor
a) uranium b) heavy water c) cadmium d) plutonium
- vi. Planck's constant has same dimensions as that of
a) Energy b) force c) frequency d) angular momentum
- vii. Which of the following has the longest wavelength?
a) Blue light b) Gamma ray c) X-ray d) Red light
- viii. The concept of matter waves was verified by
a) de Broglie b) Millikan c) Ampere d) G.P.Thomson
- ix. In Davisson – Germer experiment, maximum intensity is observed at
a) 54° & 54 V b) 50° & 54V c) 54° & 50 V d) 50° & 50 V
- x. Nobel Prize for explanation of photoelectric effect was given to
a) Planck b) Einstein c) Bohr d) de Broglie



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Roll No.

Subject: Physics-IV (Modern Physics)
PAPER CODE: PHY-007

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SECTION – B (05×4 = 20 Marks)

Q.2

- i Calculate the energy of a photon of wavelength 630nm.
- ii Give some experimental results about photoelectric effect.
- iii What do you mean by radioactivity? Explain α , β and γ -Decay
- iv What are the x-rays and how are these produced?
- v Explain Lyman and Balmer series in the spectrum of hydrogen atom.

SECTION – C (10×3=30 Marks)

Q.No.3

Explain the following

- a) Pair Production.
- b) Annihilation of matter.

Q.No.4

What is a nuclear reactor? Describe its working.

Q.No.5

Describe experimental verification of de-Broglie's hypothesis.



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Roll No. in Fig.

Roll No. in Words.

**Subject: Zoology-IV (Animal Form & Function II A
Comparative Perspective)**
PAPER CODE: ZOOL-007

MAX. TIME: 30 Min.
MAX. MARKS: 10

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Signature of Supdt.:

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(SECTION – A)

Q.1. MCQs

(1x10=10)

- Domesticated animals that escape back to nature and become adapted to the wild are called:
(a) Specialists (b) pests (c) feral animals (d) eury species
- Ecosystem tends towards maturity; in doing so they pass from a simple to a complex state. This directional change is called:
(a) Trophic maturity (b) Exploitation (c) Succession (d) Hypervolume
- During meiosis the separation of non-sister chromatids takes place during the;
(a) Metaphase (b) Anaphase (c) Interphase (d) prophase
- Of the amnion, chorion, allantois and yolk sac, which the following two give rise to embryonic part of placenta?
(a) yolk sac & chorion (b) yolk sac & amnion (c) amnion & chorion (d) chorion & allantois
- Enzyme within the acrosome of human sperm is known as
(a) acrosin (b) urosin (c) nuclease (d) ATPase
- The total chromosomal complement of a cell is known as;
(a) Phenotype (b) Genotype (c) Karyotype (d) Cytotype
- Pancreas is embedded in the wall of intestine and is not a visible organ in;
(a) Elasmobranchs (b) lampreys and lung fishes (c) Mollusks (d) birds and turtles
- The source of Progesterone hormone is
(a) Pituitary gland (b) Placenta (c) Corpus luteum (d) Hypothalamus
- Across with F1 hybrid with either of the parent is called
(a) Back cross (b) Test cross (c) reciprocal cross (d) reverse cross
- S – phase of cell cycle is characterized by;
(a) Duplication of DNA (b) duplication of cytoplasm (c) cell division (d) none of a, b, or c.



UNIVERSITY OF THE PUNJAB
Fourth Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No.

Subject: Zoology-IV (Animal Form & Function II A Comparative Perspective)
PAPER CODE: ZOOL-007

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

(SECTION – B)

Q. 2 (Attempt all questions, each question carries 4 marks)

- i. Discuss post-fertilization changes that help prepare a zygote for the ensuing mitotic divisions.
- ii. Explain the terms commensalism and Mutualism.
- iii. Write a note on feeding and digestion in bivalve mollusks.
- iv. What is meant by behavior?
- v. Define hibernation and aestivation giving examples of each.

(SECTION – C)

(Attempt all questions, draw neat and labeled diagrams where necessary, each question carries 10 marks.)

- Q. 3** (a) What is crossing over? (04)
- (b) Discuss the events that take place during ANAPHASE – I and ANAPHASE – II of meiotic division. (06)
- Q. 4** What is fertilization? What is the role of acrosome and egg binding proteins in fertilization? (10)
- Q. 5** What is meant by animal behavior? What are four ways to study animal behavior? (10)