



UNIVERSITY OF THE PUNJAB
2nd Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No.

Subject: English-II (Academic Reading & Writing)
PAPER CODE: ENG-002

MAX. TIME: 2 Hrs. 30 Min.
MAX. MARKS: 60

Attempt this Paper on Answer Sheet provided.

NOTE: Attempt All Questions.

Q.No.1.(A) Choose the correct form of the verb. (Simple present or present progressive) (04)

- i. I (think) about your father.
- ii. He (not see) what the problem is.
- iii. Now I (understand) what she wants.
- iv. Water (boil) at 100° cecius.

(B) Choose the letter of the item which is nearest in meaning to the word underlined. (03)

- i. He was reluctant to answer.
a) Unprepared b) Unwilling
c) Refusing
- ii. Your grades are mediocre and barely acceptable.
a) Average b) Satisfactory c) Very Good
- iii. He poked the button through a perforation in the fabric.
a) A small hole b) A void c) A gap

(C) Use the following phrasal verbs in your own sentences. (03)

- i. Turn down
- ii. Give up
- iii. Carry on

Q.No.2. Write short answers of five of the following questions. (20)

- i. Define reading speed. Write some techniques to enhance reading speed.
- ii. What are the basics of a good topic sentence?
- iii. How is some text summarized?
- iv. Write three faulty reading habits.
- v. Differentiate between controlling idea and topic sentence.
- vi. What does transition mean in writing?

Q.No.3 (A) Read the passage carefully and answer the questions below. (20)

Sarah Barrell braves sub-zero temperatures to trek across the Siberian wilderness in search of the elusive and endangered snow leopard.

It's the middle of the night on the edge of the world. On the fringes of civilization where man and beast have barely left a mark, 12 people are sleeping in small nylon tents. Pitched in the scant shelter of two towering mountains, the camp is at the mercy of the elements; and here on the edge of the world, where the steppe rolls relentlessly towards the horizon, the elements aren't that accommodating.

- i. What does the headline refer to?
- ii. Why do you think the writer chose to begin her article like this?
- iii. The camp is at the mercy of the elements. (Explain this sentence)
- iv. What effect does the final sentence of the paragraph have on the reader?

(B) Write a paragraph on one of the following topics. (10)

- i. Energy crisis
- ii. Global warming

Follow the following format:

- a) Topic sentence
- b) Supporting details
- c) Concluding sentence



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No. in Fig.

Roll No. in Words.

Subject: Mathematics B-II (Mechanics-II)

PAPER CODE: MATH-004

MAX. TIME: 30 Min.

MAX. MARKS: 10

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.

SECTION I

Q.1. MCQs

(1x10=10)

- In case of parabola eccentricity is _____.
a). $e < 1$ b). $e > 1$ c). $e = 1$ d). $e \leq 1$
- _____ is point on an orbit at which radius vector drawn from center of force is maximum or minimum.
a). Unit vector b). Apse c). Amplitude d). Axes
- The normal component of acceleration is _____.
a). $\frac{ds}{dt}$ b). $\frac{dv}{dt}$ c). $\frac{dt}{ds}$ d). $\frac{dt}{dv}$
- The equation of directrix of parabola is _____.
a). $y = \frac{v_0^2}{2g}$ b). $y = -\frac{v_0^2}{2g}$ c). $y = \frac{v_0^2}{g}$ d). $y = -\frac{v_0^2}{g}$
- The motion of a particle moving in a straight line with an acceleration is always directed towards its fixed point is called _____ motion.
a). rectilinear b). curvilinear c). simple harmonic d). parabolic
- If ϕ is angle between the radius vector and the tangent at p then $\tan\phi =$ _____.
a). $r \frac{d\theta}{d\phi}$ b). $2r \frac{d\theta}{d\phi}$ c). $r \frac{d\theta}{dr}$ d). $\frac{1}{2r} \frac{d\theta}{dr}$
- Rectilinear motion is a motion along _____ line.
a). sharp b). curved c). straight d). parallel
- The branch of mechanics which deals with the motion of objects is known as _____.
a). Kinetics b). Dynamics c). Kinematics d). Mechanics
- The position vector starts from _____.
a). x-axis b). y-axis c). z-axis d). origin
- The range of projectile will be maximum when $\alpha =$ _____.
a). π b). $\frac{\pi}{2}$ c). $\frac{\pi}{4}$ d). $\frac{3\pi}{4}$



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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



Subject: Mathematics B-II (Mechanics-II)
PAPER CODE: MATH-004

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

Attempt this Paper on Separate Answer Sheet provided.

SECTION II

Short Questions (5×4=20 Marks)

1. Derive periodic time of planetary motion.
2. Define Kepler's law and prove that $f \propto \frac{1}{r^2}$.
3. Define parabola of safety and drive its equation.
4. If particle describes an ellipse under a central force towards its center, find the four apses of the orbit.
5. A particle is moving along a parabola $x^2 = 4ay$ with constant speed v . Determine the tangential and normal components of its acceleration when abscissa is $\sqrt{5}a$.

SECTION III

Long Questions (3×10=30 Marks)

1. The law of force is Mu^5 and a particle is projected from an apse at distance a . Find the orbit when the velocity of projection is $\frac{\sqrt{M}}{a^2}$.
2. A particle describing Simple harmonic motion has velocities 5ft/sec and 4ft/sec. When its distances from the center are 12ft and 13ft respectively. Find the time period of motion.
3. Determine the maximum possible range for a projectile from a canon having muzzle velocity V_0 and prove that the height reached in this case is $\frac{V_0}{4g}$.



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No. in Fig.

Roll No. in Words.

Subject: Botany-II (Plant Systematic Anatomy & Development Theory)

MAX. TIME: 30 Min.

MAX. MARKS: 10

PAPER CODE: BOT-003

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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.

SECTION A (10 Marks)

Q.1 Choose the correct option.

- (i) The Plants which live for two growing seasons are called
A. Annuals B. Biennials C. Perennials D. Both B and C
- (ii) Bentham and Hooker's system of classification is a good example of
A. Artificial System B. Natural System C. Phylogenetic System D. Modern System
- (iii) If the primary root becomes thicker then it is termed as
A. Nodulated B. Tap Root C. Prop Root D. Fibrous Root
- (iv) The shiny stem is called
A. Scaly B. Glaucous C. Glabrous D. Spiny
- (v) In wheat which type of Fruit exist
A. Cypsela B. Samara C. Caryopsis D. Siliqua
- (vi) Sunflower has the inflorescence
A. Spadix B. Umbel C. Capitulum D. Hypanthodium
- (vii) Petunia Alba belongs to which family?
A. Solanaceae B. Rosaceae C. Apiaceae D. Liliaceae
- (viii) Tissues found in the tip of plants is termed as
A. Meristem B. Epidermis C. Cortex D. Endodermis
- (ix) If in a binomial, the specific epithet repeats the generic name it is known as
A. Tautonyms B. Synonym C. Homonym D. Legitimate Name
- (x) When xylem and phloem form separate bundles then it is termed as
A. Radial B. Conjoint C. Concentric D. Collateral



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Roll No.

Subject: Botany-II (Plant Systematic Anatomy & Development Theory)

PAPER CODE: BOT-003

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

Attempt this Paper on Separate Answer Sheet provided.

SECTION B (4×5)20 Marks

Q.2 Give short answers.

- i. Write down objectives of Plant Systematics.
- ii. Describe structure and functions of Sclerenchyma.
- iii. Write down the economic importance of Family Fabaceae.
- iv. Briefly describe the structure of cell wall.
- v. Describe various types of Placentation.

SECTION C (3×10) 30 Marks

Q.2 Give detailed answers.

- i. What is Phylogenetic System of Classification? Describe its merits and demerits.
- ii. Give a detailed account of Family Brassicaceae. Also give its economic importance.
- iii. What is Inflorescence? Describe the various types of Racemose Inflorescence with examples.



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No. in Fig.

Roll No. in Words.

Subject: Computer (Introduction & Applications)
PAPER CODE: COMP-001

MAX. TIME: 30 Min.

MAX. MARKS: 10

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.

Q.1. MCQs

(1x10=10)

- 1) Which of the following is not the role of operating system?
 - a) Government
 - b) Resource locator
 - c) Software development
 - d) Control program
- 2) Another name for virtual memory is
 - a) Virtual storage
 - b) Background
 - c) Foreground
 - d) Utility
- 3) The computer system can be divided into _____ components.
 - a) 3
 - b) 4
 - c) 5
 - d) 2
- 4) Which of the following is not a type of multiprocessing systems?
 - a) Symmetric
 - b) Systematic
 - c) 5 Asymmetric
- 5) Which of the following is not the state of a process?
 - a) New
 - b) Old
 - c) Waiting
 - d) Running
- 6) The Banker's Algorithm is an example of a technique for.
 - a) Deadlock prevention
 - b) Deadlock avoidance
 - c) Deadlock detection
 - d) Deadlock recovery
- 7) Which of the following command is used to terminate a process normally?
 - a) kill()
 - b) exit()
 - c) Remove()
 - d) None of them
- 8) Which of the following is not the characteristics of deadlock?
 - a) Mutual Exclusion
 - b) No preemption
 - c) Resource release
 - d) Circular wait
- 9) Which of the following is not an operating system?
 - a) Linux
 - b) Windows XP
 - c) Oracle
 - d) Unix
- 10) A process has how many states
 - a) 3
 - b) 4
 - c) 5
 - d) 2



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No.

Subject: Computer (Introduction & Applications)
PAPER CODE: COMP-001

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

Attempt this Paper on Separate Answer Sheet provided.

Q.2 Give short answers of following questions.

(5x4=20)

- i) What is the difference between hard real time system and soft real time system?
- ii) What is swapping? Mentions some of its benefits.
- iii) What are files? Provide names of file attributes.
- iv) Define process? Mention and explain its different states.
- v) What is the difference between RAM and ROM?

Q.3 What are schedulers? Explain the function its three types.

(10)

Q.4 What are the four conditions of a deadlock? Explain in detail.

(10)

Q.5 i) Explain state transition in processes.

(5+5)

ii) What is the difference between multi programmed systems and time sharing systems?



UNIVERSITY OF THE PUNJAB
2nd Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Chemistry-II (Inorganic Chemistry)
PAPER CODE: CHEM-003

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.
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(Section-A)

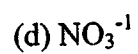
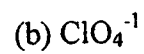
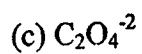
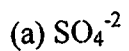
Q.1. MCQs

(1x10=10)

- Which can not exist optical isomers
(a) square planar complexes (b) Tetrahedral complexes
(c) Octahedral complexes (d) All
- Which of the following is a Lewis Acid?
(a) CCl_4 (b) I_2
(c) Na OH (d) BF_3
- Lewis Base also called
(a) Electrolyte (b) Electrophile
(c) Nucleophile (d) Substrate
- The highest oxidation state is shown by Mn is
(a) +5 (b) +6
(c) +3 (d) +7
- The secondary Valency of Cobalt (Co) in $\text{CoCl}_3 \cdot 6\text{NH}_3$ is
(a) 2 (b) 3
(c) 4 (d) 6
- Which of the following has highest covalent character in its bond
(a) NH_3 (b) HF
(c) H_2O (d) CH_4

P.T.O.

7. The least polarized anion is



8. The structure of NH_4^+ and SO_4^{-2} are referred as

(a) tetrahedral

(c) trigonal planar

(b) octahedral

(d) trigonal

9. Which of the following is diamagnetic?

(a) O

(c) O_2^+

(b) Li_2^+

(d) N_2^{-2}

10. Which is the bond order of N_2 molecule

(a) 1

(c) 2

(b) 3

(d) 4



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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



Subject: Chemistry-II (Inorganic Chemistry)

PAPER CODE: CHEM-003

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. Write applications of coordination compounds.
2. What is Lewis concept of acid and base? Explain two examples
3. Briefly discuss angle and geometry of following according to VSEPR theory
 - (a) AB_5
 - (b) AB_3E
 - (c) AB_2E
4. What is Fajan's rules for covalency?
5. Define IONIZATION ENERGY. Explain variation in periodic table.

(SECTION-C)

Q No. 3 Answer the following questions

(10 x 3=30)

1. (a) Compare Valence bond theory and Crystal field theory? (04)
(b) Write main postulates of VSEPR. (06)
2. Describe MOT with reference to Homonuclear molecule with two examples. (10)
3. Explain applications of SOFT HARD ACID BASE (SHAB) in detail? (10)



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No. in Fig.

Roll No. in Words.

Subject: Human Development & Learning
PAPER CODE: EDU-003

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

.....
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.

SECTION-A (MCQS)

1x 10=10

1. Changes which comes through growth are called
 - a) Quantitative changes
 - b) Qualitative changes
 - c) Quantitative and Qualitative both
 - d) Behavioral changes
2. The developmental aspect which refers to the changes in thinking, creativity, problem solving and decision making is called
 - a) Physical
 - b) Intellectual
 - c) Social
 - d) Emotional
3. Girls on average are superior than boys in.....at elementary level.
 - a) Mathematical reasoning and space relations
 - b) Creative abilities and language
 - c) Language and mathematical computation
 - d) Art work and drawings
4. Learning is the result of connection between stimulus and response according to.....
 - a) Behaviouristic approach
 - b) Cognitive approach
 - c) Social learning approach
 - d) Humanistic approach
5. Intelligence is demonstrated through logical and systematic manipulation of symbols related to concrete objects in
 - a) Sensory Motor Stage
 - b) Pre-operational Stage
 - c) Concrete operational Stage
 - d) Formal Operational Stage
6. The statement ' children actively construct their understanding of the world' is attributed to
 - a) Kohlberg
 - b) Pavlov
 - c) Watson
 - d) Piaget

P.T.O.

7. A student can get more understanding and appreciation of a movie by watching it than by reading the script is the law of.....
- a) Law of intensity
 - b) Law of Primacy
 - c) Law of Recency
 - d) None of the Above
8.learners acquires knowledge using feeling, touching, handling and manipulation.
- a) Auditory learners
 - b) Visual learners
 - c) Tactual learners
 - d) Kinesthetic learners
9. Programmed learning was presented by
- a) Skinner
 - b) Watson
 - c) Thorndike
 - d) Bandura
10. Speakers of one language find it easier to learn related languages.
- a) Positive Transfer of learning
 - b) Negative Transfer of learning
 - c) Zero Transfer of learning
 - d) None of Above



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No.

Subject: Human Development & Learning
PAPER CODE: EDU-003

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

Attempt this Paper on Separate Answer Sheet provided.

SECTION-B (SHORT ANSWERS)

4x5=20

Note: Attempt all questions.

- Q#1. Differentiate between classical conditioning and operant conditioning? (04)
- Q#2. What is the role of teacher in social development of learner? (04)
- Q#3. Describe the learning and thinking styles of the learners? (04)
- Q#4. Explain the components of language? (04)
- Q#5. What are the types of transfer of learning, Explain with examples? (04)

SECTION – C (LONG QUESTIONS)

3x10=30

Attempt all questions. All questions carry equal marks.

- Q#1: What are the principles of growth and development? Explain their educational implications?
- Q#2: Explain Jean Piaget cognitive development theory?
- Q#3: Describe types of individual differences?



UNIVERSITY OF THE PUNJAB
2nd Semester – 2018
Examination:- B.S.Ed. (Hons.) 4 Years Degree Program

Roll No. in Fig.

Roll No. in Words.

Subject: Mathematics A-II (Plane Curves & Analytic Geometry) MAX. TIME: 30 Min.
PAPER CODE: MATH-003 MAX. MARKS: 10

.....
 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.

Section-I

Q.1. MCQs

(1x10=10)

- i Length of latus rectum of parabola with focus F (a, 0) is
 (a) a (b) 2a (c) 3a (d) 4a
- ii If $\tan \theta = \frac{2\sqrt{h^2 - ab}}{a + b}$, then if $h^2 - ab = 0$, lines are
 (a) Parallel (b) Perpendicular (c) Equal (d) None
- iii In case of $y^2 = 4ax$, then parametric equations are
 (a) $x=at, y=2at$ (b) $x=at, y=2at^2$ (c) $x=at, y=2at^2$ (d) None
- iv Point of inflection of the curve $f(x) = \frac{2}{x} - \frac{4}{x^2}$ is
 (a) $(0, \frac{2}{9})$ (b) (6, 0) (c) $(6, \frac{2}{9})$ (d) None
- v In case of $(x^2 + y^2)(2a - x) = b^2x$, singular point is
 (a) Node (b) Cusp (c) Isolate point (d) None
- vi Lemniscate $r^2 = a^2 \cos 2\theta$ is symmetric about
 (a) x-axis (b) y-axis (c) line $\theta = \frac{\pi}{2}$ (d) line $\theta = \frac{\pi}{4}$
- vii Measure of angle of intersection of $r = a\theta$ and $r\theta = a$ is
 (a) $\frac{\pi}{2}$ (b) $\frac{\pi}{4}$ (c) $\frac{\pi}{6}$ (d) None
- viii A (2, 3, 4), B (8, -1, 2) and C (-4, 1, 0) are vertices of which triangle
 (a) Right Triangle (b) Isosceles Triangle (c) Both (d) None
- ix If M: $\frac{x-2}{2} = \frac{y-3}{7} = \frac{z+1}{3}$, then direction ratios are
 (a) (-2, -3, 1) (b) (3, 2, 1) (c) (2, -1, 3) (d) (2, 7, 3)
- x In case of rectangular hyperbola
 (a) $a \neq b$ (b) $a = b$ (c) $ab = 1$ (d) None



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No.

Subject: Mathematics A-II (Plane Curves & Analytic Geometry)
PAPER CODE: MATH-003

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

Attempt this Paper on Separate Answer Sheet provided.

Section-II (4×5=20)

Q.2

- Find angle between a pair of lines $11x^2 + 16xy - 4y^2 = 0$.
- Find **normal equation** of $x(x^2 + y^2) - ay^2 = 0$ at $x = \frac{a}{2}$.
- Find the area of the region included within the **cardioid** $r = a(1 - \sin\theta)$.
- Find the **distance** of the given point P from the line L
P (0, -2, 1) and L: $\frac{x-1}{4} = \frac{y+3}{-2} = \frac{z+1}{5}$.
- Identify the **polar equation**, $r = \frac{9}{2 + \sin\theta}$.

Section-III (10×3=30)

- Analyze the conic $16x^2 - 24xy + 9y^2 + 100x - 200y + 100 = 0$.
- Prove that the **intrinsic equation** of the cycloid $x = a(\theta + \sin\theta)$, $y = a(1 - \cos\theta)$ is $s = 4a \sin\psi$.
- Find **equation of perpendicular** from the origin to the line $x + 2y + 3z + 4 = 0 = 2x + 3y + 4z + 5$. Also find the **coordinates** of the foot of the perpendicular.



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No. in Fig.

Roll No. in Words.

Subject: Physics-II (Waves & Oscillation)

PAPER CODE: PHY-003

MAX. TIME: 30 Min.

MAX. MARKS: 10

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.
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SECTION – A (10 Marks)

Q.1 Encircle the most appropriate option.

- i. A spring of spring constant k is cut into three parts of equal lengths. What will be the spring constant of each part?
a) k b) $2k$ c) $3k$ d) $4k$
- ii. A particle executes S.H.M. with frequency f . The frequency with which its kinetic energy oscillates is
a) $f/2$ b) f c) $2f$ d) $4f$
- iii. Frequency of a seconds pendulum is
a) 1 Hz b) 2 Hz c) 0.5 Hz d) 0.25 Hz
- iv. Which of the following cannot be polarized?
a) radio wave b) X-rays c) sound wave d) infrared radiation
- v. Which of the following is a unit of intensity of light?
a) N.m/s b) J/s.m c) W/m² d) J.m/s
- vi. The amplitude of two interfering waves are A and $2A$ respectively. The resultant amplitude in the condition of constructive interference will be
a) A b) $2A$ c) $3A$ d) $4A$
- vii. Which of the following has the shortest wavelength?
a) Blue light b) Gamma ray c) X-ray d) Red light
- viii. Longitudinal waves cannot exhibit
a) polarization b) interference c) diffraction d) reflection
- ix. When the bob of a simple pendulum is at extreme position, it is at a height 'h' above the equilibrium position. The velocity of the bob at mean position is
a) $v = 2gh$ b) $v = gh$ c) $v = 4gh$ d) $v = \sqrt{2gh}$
- x. In SHM, there is always a constant ratio between the displacement of the body and its
a) frequency b) velocity c) acceleration d) mass



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No.

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 50

Subject: Physics-II (Waves & Oscillation)

PAPER CODE: PHY-003

Attempt this Paper on Separate Answer Sheet provided.

SECTION – B (05×4 = 20 Marks)

Q.2

- Explain principal of superposition.
- Define resonance. Give examples of resonance from daily life.
- Differentiate between free, damped and forced harmonic oscillation.
- What is diffraction grating? How wavelength of light is measured by diffraction grating?
- How interference of light is produced in thin films.

SECTION – C (10×3=30 Marks)

Q.No.3

What is a simple pendulum? Prove that motion of a simple pendulum is simple harmonic. Also derive relations for time period and frequency of the pendulum.

Q.No.4

Describe principle, construction and working of a Michelson's interferometer. How wavelength of light is measured by it?

Q.No.5

What is Doppler's effect? Derive relations for apparent frequency of sound for the four different cases of Doppler's effect.



UNIVERSITY OF THE PUNJAB

2nd Semester - 2018

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

Roll No. in Fig.

Roll No. in Words.

**Subject: Zoology-II (Animal Diversity-II Classification,
Phylogeny & Organization)**

MAX. TIME: 30 Min.

MAX. MARKS: 10

PAPER CODE: ZOOL-003

Signature of Supdt.:

Attempt this Paper on this Question Sheet only.

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SECTION A

(1x10=10)

- i. Most zoologists believe that Echinoderms share a common ancestry with
a) Hemichordates (b) chordates (c) both of a and b (d) Annelids
- ii. Larvae of echinoderms are;
a) Radially symmetrical (b) Bilaterally symmetrical (c) Biradially symmetrical (d) none of a, b, or c.
- iii. Amphioxus are members of the sub-phylum
a) Cephalochordata (b) Urochordata (c) Hemichordata (d) none of a, b or c.
- iv. Chordates use the mucous secreting ciliated groove called _____ to trap food particles during filter feeding.
a) Notochord (b) endostyle (c) stigma (d) buccal cirri
- v. Sharks have tough skin with
a) Placoid scales (b) Ganoid scales (c) cycloid scales (d) Ctenoid scales
- vi. Marine fishes drink sea-water and eliminate excess ions by;
a) Excretion and defecation (b) active transport across gill surfaces (c) Both a and b (d) none of a, b or c.
- vii. Majority of fishes are
a) Oviparous (b) ovoviviparous (c) Viviparous (d) none of a, b or c.
- viii. In frogs and toads the skin lacks covering of;
a) Scales (b) feathers (c) hairs (d) all a, b and c.
- ix. Caecilians are members of the order
a) Caudata (b) Anura (c) Gymnophiona (d) Temnospondyle
- x. Series of abrupt structural, physiological, and behavioral changes that transforms a larva into adult are called
a) Embryogenesis (b) morphogenesis (c) Metamorphosis (d) Paedomorphosis.



UNIVERSITY OF THE PUNJAB

2nd Semester – 2018

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

Roll No.

**Subject: Zoology-II (Animal Diversity-II Classification,
Phylogeny & Organization)**

MAX. TIME: 2 Hrs. 30 Min.

MAX. MARKS: 50

PAPER CODE: ZOOL-003

Attempt this Paper on Separate Answer Sheet provided.

SECTION

B

(4X5)

Answer the following. Answer must be comprehensive and to the point.

Q.2. Write the function of hemal system in echinoderms.

Q3. What are lymphatic hearts? In which group of vertebrates they are found?

Q4. What characteristics of Archeopteryx are reptile like?

Q5. Differentiate between a single circuit heart and a double circuit heart with example
From each type.

SECTION

C

(3X10)

Answer the following questions. Draw labeled diagrams where necessary.

Q6. Write a note on horns and antlers.

(10)

Q7. (a) Write a note on osmoregulation in Elasmobranches.

(6)

(b) What an endostyle? What is its function?

(4)

Q8. (a) What is lateral line canal system? Write its functions.

(5)

(b) What is a respiratory tree? How does water circulates in the
respiratory tree?

(5)