



Attempt this Paper on this Question Sheet only.

(OBJECTIVE)

(10x1=10)

Q No. 1: Choose the correct option from the statements from the multiple choices given below.

1. Scorpions belong to the class
 - a. Arachnida
 - b. Merostomata
 - c. Pycnogonida
 - d. Remipedia
2. The members of Phylum Ctenophora are called as
 - a. Sea lilies
 - b. Sea flowers
 - c. Sea Cucumbers
 - d. Sea Walnuts
3. Total body segments of leech are
 - a. 32
 - b. 33
 - c. 34
 - d. 35
4. Karyotyping are routinely prepared from
 - a. RBC
 - b. WBC
 - c. RBC & WBC
 - d. Platelets
5. Oligochaetes are mostly
 - a. Herbivores
 - b. Scavengers
 - c. Carnivores
 - d. Omnivores
6. The ratio of WBC to RBC is
 - a. 1:60
 - b. 1:600
 - c. 1:6000
 - d. 1:60000
7. Sponges are mostly
 - a. Monoecious
 - b. Dioecious
 - c. Hermaphrodite
 - d. Oviparous
8. As many as 800 million people throughout the world may be infected with
 - a. *Enterobious vermicularis*
 - b. *Necator americanus*
 - c. *Ascaris lumbricoides*
 - d. *Trichinella spiralis*
9. Mendel tested characters by crossing a variety carrying a particular trait of a character were
 - a. 5
 - b. 7
 - c. 6
 - d. 8
10. Shrimps belong to the Phylum
 - a. Platyhelminthes
 - b. Mollusca
 - c. Annelida
 - d. Arthropoda



UNIVERSITY OF THE PUNJAB

First Semester 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Zoology-I (Invertebrate Diversity)
Course Code: ZOOL-101

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

(Short Questions)

Question No. 2. Write short answer of the following questions (2X10=20)

- I. What is Tagmatization?
- II. What is Heterosis?
- III. What are symbiotic ciliates?
- IV. What are Rhabdites?
- V. What are Deletions?
- VI. What is Ecdysis?
- VII. What is pentaradial symmetry?
- VIII. What are Multiple alleles?
- IX. What is Co-dominance?
- X. What are the morphological features of Annelids?

(Long Questions)

Question No. 3. Explain the following questions? (10X3=30)

- I. Write a detailed note on Mendelian Law of segregation?
- II. Explain in detail the chromosomal variations in structure?
- III. Discuss in detail the Torsion in Phylum Mollusca?



UNIVERSITY OF THE PUNJAB

Second Semester - 2018
Examination: B.S. 4 Years

Roll No.

PAPER: Zoology-II (Chordate Diversity)
Course Code: ZOOL-103, ZOL-12302 Part - II

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

Attempt this Paper on Separate Answer Sheet provided.

Question No. 2: Shortly answer the following questions.

2 X 10 = 20

- I. Describe musk glands in mammals?
- II. What are eutherians?
- III. Give different types of feathers in birds?
- IV. Write a note on *Eoalulavis*?
- V. Briefly describe order testudines?
- VI. Give structure of amniotic egg with help of a diagram?
- VII. Describe structure of heart of frog?
- VIII. Write a brief note on osteolepiformes?
- IX. Give general features of phylum hemichordata?
- X. Write a brief note on water vascular system in Echinoderms?

Question No. 3: Explain the following questions.

10 X 3 = 30

- I. Explain migration and navigation in birds?
- II. Write a detailed note on orders of class Reptilia?
- III. Explain reproduction, development, metamorphosis and vocalization in Amphibians?



UNIVERSITY OF THE PUNJAB

Second Semester - 2018
Examination: B.S. 4 Years

Roll No.

PAPER: Zoology-II (Chordate Diversity)

TIME ALLOWED: 15 Min.

Course Code: ZOOL-103, ZOL-12302 Part – I (Compulsory)

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCO carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Question No. 1:

(10x1=10)

I. Which of the following is not a deutrostome?

- (a) Chordates (b) Hemichordates (c) Molluscs (d) Echinoderms

II. Amphioxus belongs to:

- (a) Urochordata (b) Cephalochordata (c) Vertebrata (d) Reptilia

III. Bony armored fishes are:

- (a) Placoderms (b) Ostracoderm (c) Elasmobranchs (d) Lung fishes

IV. Number of species of order Caudata is:

- (a) 300 (b) 350 (c) 400 (d) 500

V. Amphibians are:

- (a) Ectothermic (b) Endothermic (c) Homeothermic (d) Warm blooded

VI. Tail loss in lizards is called:

- (a) Epiboly (b) Autotomy (c) Ecdysis (d) Molting

VII. One of the following is not a crocodylian:

- (a) Alligators (b) Gavials (c) Sphenodon (d) Caimans

VIII. A coat of hair is called:

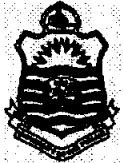
- (a) Fur (b) Skin (c) Vibrissae (d) Pelage

IX. Factors which effect the migration:

- (a) Innate clock (b) Environmental factor (c) Feeding mode (d) a & b

X. Part of the digestive tract of a pigeon that produces "pigeon's milk" used in feeding young is the:

- (a) Esophagus (b) Gizzard (c) Crop (d) Proventriculus



UNIVERSITY OF THE PUNJAB

Third Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Zoology-III (Biochemistry)
Course Code: ZOOL-201/ZOL-21302

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE TYPE

- Q.2 Give short answer of the following** **2x10=20**
- i. Write the effect of mutation pressure on evolution.
 - ii. Differentiate between hydrosphere and ecosphere
 - iii. Write briefly about growth curve
 - iv. Differentiate between ecosystem and biome.
 - v. Define evolution. Discuss briefly about the origin of life.
 - vi. What do you mean by non standard amino acids? Briefly explain its role.
 - vii. Write four examples of disaccharides and polysaccharides.
 - viii. Write about reversible inhibition of enzymes.
 - ix. How temperature effect on enzyme activity.
 - x. What is meant by Homo- and Hetero-polysaccharides?

- Q.3 Long questions.** **3x10=30**
- I** How enzymes work? Write kinetics of bisubstrate and multisubstrate reactions.
 - II** Write a comprehensive note on factors initiating micro-evolution by changing immigration and crossbreeding.
 - III** Give a detail note on basic population characters, population dynamics and regulations.



UNIVERSITY OF THE PUNJAB

Roll No.

Third Semester 2018
Examination: B.S. 4 Years Programme

PAPER: Zoology-III (Biochemistry)
Course Code: ZOOL-201/ZOL-21302

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

Q.1 Multiple choice questions: Four possible answers to each statement have been given below. Encircle the correct answer. Cutting, erasing and overwriting is strictly prohibited.

1. Starch consists of
 - A) Unbranched amylose and branched amylopectin
 - B) Branched amylose and branched amylopectin
 - C) Unbranched amylose and unbranched amylopectin
 - D) None of these
2. Which of the following is a reducing sugar
 - A) Glucose
 - B) Dihydroxyacetone
 - C) Erythulose
 - D) None of these
3. A dipeptide has
 - A) 2 amino acids and 1 peptide bond
 - B) 2 amino acids and 2 peptide bond
 - C) 2 amino acids and 3 peptide bond
 - D) None of these
4. Tertiary structure is maintained by
 - A) Peptide bond
 - B) Hydrogen bond
 - C) Di-sulphide bond
 - D) All of these
5. Haemoglobin has
 - A) Primary structure
 - B) Secondary structure
 - C) Tertiary structure
 - D) Quaternary structure
6. Two sugars which differ from one another only in configuration around a single carbon atom are termed
 - A) Epimers
 - B) Anomers
 - C) Optical isomers
 - D) Stereoisomers
 - E) None of these
7. A species inhabiting different geographical areas is known as
 - A) Sympatric
 - B) Allopatric
 - C) Sibling
 - D) Biospecies
 - E) None of these
8. The theory of use and disuse was given by
 - A) Stebbins
 - B) Lamarck
 - C) Aristotle
 - D) Vavilov
 - E) None of these
9. Symbiosis is a relationship between members of
 - A) Same species
 - B) Two species
 - C) Different species
 - D) Equal species
 - E) None of these
10. Considering earth's ecosystem, consumers are classified as
 - A) Autotrophs
 - B) Heterotrophs
 - C) Tertiary autotrophs
 - D) Secondary autotrophs
 - E) None of these



UNIVERSITY OF THE PUNJAB

Fourth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Zoology-IV (Physiology)

TIME ALLOWED: 15 Mints.

Course Code: ZOOL-203 / ZOL-22302 Part - I (Compulsory)

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

QUESTION NO 1:

(1x10=10)

- I. The chemical agent responsible for communication in a chemical synapse
 - a) Neuromodulator
 - b) Neurotransmitter
 - c) Neurohormone
 - d) Hormone
- II. The simplest form of nervous organization exists in
 - a) Porifera
 - b) Protozoa
 - c) Cnidaria
 - d) Platyhelminthes
- III. The receptors that respond to mechanically induced changes and detect movements and positioning of body parts
 - a) Georeceptors
 - b) Proprioceptors
 - c) Phonoreceptors
 - d) Baroreceptors
- IV. The structure in mammalian ear that gives greater sensitivity to pitch and volume of sound than other animals
 - a) Cochlea
 - b) Semicircular canal
 - c) Tympanum
 - d) External auditory meatus
- V. In polychaetes, the hormone that inhibits the gonads and stimulates growth and regeneration
 - a) Molt inhibiting hormone
 - b) Gonadotrophin
 - c) Juvenile hormone
 - d) Ecdysone
- VI. The hormone that inhibits calcium reabsorption from bone
 - a) Parathyroid hormone
 - b) Thyroxin
 - c) Somatostatin
 - d) Calcitonin
- VII. In mammals, the hormone that functions in defense response to infection or tissue injury
 - a) Cortisol
 - b) Epinephrine
 - c) Aldosterone
 - d) Glucagon
- VIII. The site of synthesis of bile
 - a) Gall bladder
 - b) Liver
 - c) Pancreas
 - d) Duodenum
- IX. The cellular components that are absent in a prokaryotic cell
 - a) Mitochondria
 - b) Vacuoles
 - c) Ribosomes
 - d) Vesicles
- X. The structures that contain enzymes called acid hydrolases
 - a) Ribosomes
 - b) Peroxisomes
 - c) Mitochondria
 - d) Lysosomes



UNIVERSITY OF THE PUNJAB

Fourth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Zoology-IV (Physiology)

Course Code: ZOOL-203 / ZOL-22302 Part – II

TIME ALLOWED: 2 Hrs. & 45 Mints.

MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

QUESTION NO 2. SHORTLY ANSWER THE FOLLOWING QUESTIONS. (2X10=20)

- I. Make a flow chart to show that the basic organization of nervous system is similar in all groups of vertebrates.
- II. Describe the location and function of hygrometers in insects
- III. What do you know about sonar, a form of echolocation?
- IV. Describe the endocrine system of annelids.
- V. Compare the structure and function of microtubules and microfilaments.
- VI. With the help of labeled figures only, compare the heart and circulatory system of amphibians and reptiles. Indicate the direction of blood flow as well.
- VII. Give four basic physiological principles that apply to lung ventilation.
- VIII. Differentiate hemocyanin and hemerythrin.
- IX. Give a comparison of continuous and discontinuous feeders.
- X. Describe, briefly, the digestion in oral cavity of mammals.

QUESTION NO 3. EXTENSIVE QUESTIONS.

**BRIEFLY ANSWER THE FOLLOWING QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.
(10X3=30)**

- I. Give an account of the structure and function of endoplasmic reticulum and golgi apparatus .
- II. Discuss, very briefly, five general evolutionary trends in nervous system development of invertebrates
- III. Account the sites of synthesis and secretion, chemical nature and functions, of the hormones of adrenal gland and pancreas.



Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

SECTION-I

Q1: Select the most appropriate answer from the given choices

(0.5x20=10)

1. Why should patients with xeroderma pigmentosum avoid sunlight?
 - a. The UV wavelength do irreparable damage to DNA
 - b. Sunlight inhibits any residual DNA repair in the Cell
 - c. The patients lack pigmentation to protect them from burning
 - d. Sunlight inhibits DNA polymerase
2. ATP is from which general category of biomoleculaeas
 - a. Polysaccharides
 - b. Proteins
 - c. Nucleotides
 - d. Aminoacids
3. During translation, chain elongation continues until
 - a. no amino acids are left
 - b. all tRNAs are empty
 - c. the ribosomes run off the end of mRNA
 - d. chain terminator codons occur
4. When chromatin is treated with nonspecific nucleases, what is the length of the resulting pieces of DNA?
 - a. Random number os base pairs
 - b. About 60 base pairs
 - c. About 8 base pairs
 - d. About 200 base pairs
5. If there were a mutation in the regulatory gene of an inducible promoter rendering the protein incapable of binding to the repressor, then:
 - a. The structural genes would always be expressed
 - b. The structural genes would never be expressed
 - c. The structural genes would only be expressed in the presence f inducer.
 - d. The structural genes would only be expressed in the absence of the inducer.
6. What kind of molecules must pass between the nucleus and the cytoplasm
 - a. DNA
 - b. Protein
 - c. Lipids
 - d. Carbohydrates
7. A geneticist found that a particular mutation had no effect on the polypeptide encoded by a gene. This mutation probably involved
 - a. deletion of the entire gene
 - b. insertion of one nucleotide
 - c. substitution of one nucleotide
 - d. deletion of one nucleotide
8. In leucine Zipper transcription factor motif every _____ amino acid is Leucine.
 - a. 2nd
 - b. 3rd
 - c. 6th
 - d. 7th
9. The first amino acid during translation (in prokaryotes) is always
 - a. Formylated methionie
 - b. Formylated alanine
 - c. Formylated leucine
 - d. Acetylated methionine
10. In prokaryotes the repair activity is attributed to which replication enzyme
 - a. POL I
 - b. POL II
 - c. POL III
 - d. POL I&III

P.T.O.

11. Of the four classes of cellular macromolecules, which one is not a component of cell membranes?
 - a. Proteins
 - b. Lipids
 - c. DNA & RNA
 - d. Carbohydrates
12. In a double stranded molecule of DNA, the ratio of purines : pyrimidines is:
 - a. variable
 - b. determined by the base sequence in RNA
 - c. always 1:1
 - d. determined by the number of purines in the sense strand of the DNA
13. During transcription the strand that has similar sequence as of mRNA is :
 - a. conservative
 - b. Semi conservative
 - c. Sense
 - d. Antisense
14. During sickle cell anemia due to point mutation, which one of the cell type in the blood become abnormal
 - a. Red blood cell
 - b. White blood cell
 - c. Platelets
 - d. All of the above
15. In Prokaryotes which of the polymerase have proofreading and exonuclease activity
 - a. Polymerase I
 - b. Polymerase II
 - c. Polymerase III
 - d. Core enzyme
16. Mutations are errors in DNA that:
 - a. only occur in the presence of carcinogens
 - b. increase tumour growth
 - c. occur spontaneously at a low rate
 - d. only occur on the X chromosome
17. The transcription of DNA to a molecule of messenger RNA occurs (in prokaryotes):
 - a. on the ribosomes
 - b. in the cytoplasm
 - c. in the nucleus
 - d. only during cell division
18. The length of the okazaki fragments in Prokaryotes is
 - a. 20
 - b. 200
 - c. 2000
 - d. 20000
19. In prokaryotes mRNA is elongated by core enzyme with the help of
 - a. Sigma factor
 - b. NUS factor
 - c. Rho factor
 - d. Omega factor
20. Which of the following mutations results into frame shift
 - a. Deletion
 - b. Insertion
 - c. Transversion
 - d. a and b



UNIVERSITY OF THE PUNJAB

Fifth Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Cell and Molecular Biology-II
Course Code: ZOOL-301

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE TYPE

SECTION 2

Q2: Give short answers of following questions.

2x10=20

- i) What is a replicon?
- ii) What is difference between leading strand and lagging strand of DNA?
- iii) What changes come in the proteins if any deletion or insertion mutation occurs?
- iv) What is the function of repressor protein in the regulation of Lactose operon?
- v) What is an operon?
- vi) Describe E,P and A site in the ribosome during translation.
- vii) What is the difference between Thymine and Uracil in terms of structure?
- viii) What is nuclease activity. Briefly discuss its types.
- ix) Function of Helicase in DNA replication.
- x) Why Genetic code is triplet.

SECTION 3

Q-3 Give brief answers of the following questions

30

- a. Describe the process of splicing of mRNA.
- b. Regulation of Gene expression in eukaryotes at translation level. What is the role of 5' UTR and 3' UTR.
- c. Explain the process of Genetic Engineering.



UNIVERSITY OF THE PUNJAB

Roll No.

Fifth Semester 2018

Examination: B.S. 4 Years Programme

PAPER: Biochemistry-II
Course Code: ZOOL-303

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

- Q. 1 Multiple choice questions: Four possible answers to each statement have been given below. Encircle the correct answer. Cutting, erasing and overwriting is strictly 10 prohibited.**
- i The oxidized lipoic acid have
 - A. S-S linkage
 - B. -SH group
 - C. -NH linkage
 - D. Both A and B
 - ii Reaction in a system eventually reach equilibrium and no work is done
 - A. open system
 - B. Close system
 - C. Internal system
 - D. Both A and B
 - iii $K'_{eq} > 1$ predict
 - A. Forward and exergonic
 - B. Reverse and exergonic
 - C. Forward and endergonic
 - D. Reverse and endergonic
 - iv Glycogen serves as to maintain blood glucose level
 - A. Acid
 - B. Base
 - C. Buffer
 - D. Vary from cell to cell
 - v. In carboxylic group ,carbon acts as :
 - A Electrophile
 - B. nucleophile
 - C. both
 - D. none
 - vi. Which one is used for the shifting of bonds
 - A. NAD⁺
 - B.FAD⁺
 - C. NADP
 - D. none
 - vii. Which is formed when galactose 1P displaces glucose 1P from UDP-glucose by UDP-glucose ?
 - A. UDP glucose
 - B. UDP galactose
 - C. UDP lactose
 - D. None of these
 - viii. Two sugars that differ only in configuration around one carbon atom are called
 - A. Epimers
 - B. polymer
 - C. Steriomer
 - D. None of these
 - ix. How many steps are involved in glycogen synthesis process
 - A. 2
 - B. 3
 - C. 5
 - D. 10
 - x Non-oxidative phase of pentose phosphate pathway converts
 - A. Hexoses into pentoses
 - B. Trioses into pentoses
 - C. Pentoses into hexoses
 - D. None of these



UNIVERSITY OF THE PUNJAB

Fifth Semester 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Biochemistry-II
Course Code: ZOOL-303

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE TYPE

Q.2 Give short answer of the following **2x10=20**

- i. Point out regulation factors of urea cycle
- ii. How does synthesis of steroids differ from that of peptide hormones?
- iii. Point out rate limiting step in cholesterol synthesis.
- iv. What is the location of alpha oxidation of fatty acids?
- v. Enlist few functions of steroid hormones.
- vi. Briefly explain synthesis of steroid hormones.
- vii. What are the primary and secondary site(s) of cholesterol production?
- viii. Define Allosteric regulation
- ix. Differentiate between oxidase and oxygenase.
- x. What is meant by reducing and non reducing sugars? Give an examples.

Q.3 Long questions. **3x10=30**

- I Write a detail note on beta oxidation of fatty acid.**
- II What is meant by Gluconeogenesis? Discuss three bypass in detail.**
- III Give a comprehensive note on biosynthesis of purine in detail.**



UNIVERSITY OF THE PUNJAB

Roll No.

Fifth Semester 2018

Examination: B.S. 4 Years Programme

PAPER: Animal Physiology – II

TIME ALLOWED: 30 mins.

Course Code: ZOOL-305

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

Encircle the correct answer:

(10)

- Aquaporins in the plasma membrane of cells allow rapid passage of _____ molecules :**
(a) glucose (b) water (c) lipids (d) proteins
- The minimum amount of stimulus required to initiate an action potential is called :**
(a) latency period (b) threshold stimulus (c) all or none law (d) all of the above
- Troponin C a component of troponin has affinity for :**
(a) actin (b) calcium (c) myosin (d) tropomyosin
- Muscles in the walls of hollow organs are :**
(a) smooth muscles (b) skeletal muscles (c) cardiac muscles (d) all of the above
- Sensory receptors in human are concentrated on :**
(a) external ear (b) middle ear (c) cochlea (d) tympanic membrane
- Hormones are chemicals released from :**
(a) endocrine glands (b) exocrine glands (c) lymphatic system (d) circulatory system
- Dwarfism is caused by deficiency of :**
(a) TSH (b) growth hormone (c) insulin (d) glucagon
- For synthesis of thyroid hormones _____ is required :**
(a) iodide (b) cyanide (c) citric acid (d) lactic acid
- Hormone involved in lowering blood calcium level is:**
(a) parathormone (b) insulin (c) glucagon (d) calcitonin
- Usually ovulation occurs _____ days after the onset of menstruation cycle :**
(a) 28 (b) 14 (c) 10 (d) 30



Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

- Q. 1** **Encircle the correct answer** **1x10=10**
- i. The measure of variability produced by experiment and not by data is
 - A. Standard deviation
 - B. Standard error
 - C. Dispersion
 - D. Chance
 - ii. Correlation ranges from
 - A. 0 to 0.5
 - B. 0.5 to 1
 - C. 0 to 1
 - D. 1 to 100
 - iii. The mode of 1,3,6,4,2,4,6,3,5,3 data is.
 - A. 1
 - B. 3
 - C. 4
 - D. 6
 - iv. The Median of 30, 19, 17, 16, 15, 10, 5, 2 is
 - A. 17
 - B. 5.5
 - C. 19.5
 - D. 10
 - v. Eye color is an example of _____ type of data.
 - A. Binary
 - B. Categorical
 - C. Numerical
 - D. Nominal
 - vi. The ages in days of mice are (4,5,8,6,2,9,1,5). Determine the MEAN age of mouse
 - A. 3
 - B. 4
 - C. 5
 - D. 6
 - vii. The formula of standard error is S.E=_____.
 - A. S/\sqrt{n}
 - B. $\sqrt{S^2/n}$
 - C. S/n
 - D. Both a and b
 - viii. In a set of data, the difference between the largest and smallest value is called _____.
 - A. Mean
 - B. Median
 - C. Mode
 - D. Range
 - ix. The addition rule of probability applies to
 - A. Independent events
 - B. Dependent events
 - C. Mutually exclusive events
 - x. An equation used to predict the value of one parameter on the basis of other parameter is called _____.
 - A. Variance
 - B. Standard Deviation
 - C. Correlation
 - D. Regression



UNIVERSITY OF THE PUNJAB

Fifth Semester 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Biostatistics
Course Code: ZOOL-307

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.
SUBJECTIVE TYPE

Q.2 Give short answer of following questions **2x10=20**

- i. Differentiate between NULL and ALTERNATIVE HYPOTHESIS
- ii. Calculate mean of following data?

Observations	4	7	11	15	16
Frequency	3	5	8	4	3

- iii. What is ANOVA? Also give its uses
- iv. Write down the formula of Median
- v. What is Regression?
- vi. Give various types of statistical data.
- vii. Define CORRELATION.
- viii. Define Mid-Point.
- ix. Give formula of unpaired t-test.
- x. What is mode of following data?

Classes	100-120	120-140	140-160	160-180	180-200
Frequency	1	3	5	2	1
Mid-point	110	130	150	170	190

BRIEF ANSWERS OF THE FOLLOWINGS

Q.3 (a) Prepare a frequency table showing Absolute, Relative and Cumulative frequency of the data provided. **6**

99,87,73,55,57,96,83,50,53,44,42,45,57,75,42,49,92,88,47,40

Q.3 (b) Draw a PASCAL triangle upto 7th level? **4**

Q.4 Is there enough evidence to claim that there is no preference in selection of Fruit Soda Flavors in the following data ($\alpha=0.05$) **10**

Frequency	cherry	Strawberry	orange	lime	grape
Observed	32	28	16	14	10
Expected	20	20	20	20	20

Q.5 Calculate the Variance, Standard deviation and Standard error of following data **10**

30, 37, 40, 26, 45, 50



UNIVERSITY OF THE PUNJAB

Roll No.

Fifth Semester 2018
Examination: B.S. 4 Years Programme

PAPER: Evolution
Course Code: ZOOL-308

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

OBJECTIVE TYPE

SECTION 1.

Q1. Select the most appropriate answer from the given options. (1 x 10)

1. What type of selection would favor individuals of intermediate rather than extreme sizes?
 - a) Directional selection
 - b) Stabilizing selection
 - c) Disruptive selection

2. Which of these process does NOT maintain polymorphism in population
 - a. Density dependent selection
 - b. Mutation –Selection balance
 - c. Heterozygote advantage
 - d. all above

3. Traits acquired by parents during their life time are passed to their offspring was proposed by _____.
 - a. Darwin
 - b. Lamarck
 - c. Oparin
 - d. Hugo

4. According to modern theory of evolution, main mechanism of change is _____.
 - a. Natural selection
 - b. founder effect
 - c. migration
 - d. special creation

5. In what situation you expected to find random drift
 - a. Small population size
 - b. Population not experiencing selection pressure
 - c. A diploid population
 - d. Population with high mutation rate

6. Heterochrony means

P.T.O.

- a. ontogeny recapitulate phylogeny
 - b. Evolutionary change in timing of one developmental process as compared to others
 - c. Evolutionary later adult forms have descended from the juvenile ancestral stages
 - d. None above
7. Primitive atmosphere was _____ with no free molecular oxygen.
- a. Oxidizing
 - b. Reducing
 - c. Dry
 - d. mild
8. Fitness is
- a. Natural selection
 - b. Relative reproductive success
 - c. Adaptation
 - d. survival
9. Gene pool of _____ may not be representative of their parent population.
- a. founder members
 - b. inbreeders
 - c. homozygous individuals
 - d. All above
10. Which type of selection could lead to population to split into two
- a. Directional selection
 - b. Stabilizing selection
 - c. Disruptive selection
 - d. None



UNIVERSITY OF THE PUNJAB

Fifth Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Evolution
Course Code: ZOOL-308

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SUBJECTIVE TYPE

SECTION II

Q2. Write short and precise answers of following questions. (2x10)

- I. What is struggle for existence?
- II. Can we assess the frequency of gene and genotype?
- III. What are the effect of migration on the population?
- IV. What is density dependent selection?
- V. Describe effects of genetic drift.
- VI. What is Kin selection?
- VII. Define Linkage disequilibrium.
- VIII. Define theory of Phyletic gradualism
- IX. Define stasis.
- X. What is Genetic Load?

SECTION III

Q3. Answers these questions. (10 x3)

Q3. Describe different Theories of Natural Selection in detail. (10)

Q4. How does haplotype frequencies alter in a population? (10)

Q5. What is sexual selection. Describe Zahavi theory of sexual selection in detail (10)



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Molecular Genetics II
Course Code: ZOOL-310 Part – II

TIME ALLOWED: 2 Hrs. & 45 Mints.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

B. Short questions: answer the following short questions (10x2=20)

- i. Briefly explain Chargaff rules.
- ii. Define nucleosome repeat length.
- iii. Distinguish between reverse transcription PCR and real time PCR.
- iv. Write functions of helicase and SSB proteins in DNA replication.
- v. Distinguish type-I and type-II topoisomerases.
- vi. What is the role of sigma factor in transcription initiation?
- vii. What is leader sequence?
- viii. What is meant by polyadenylation?
- ix. Define repressor.
- x. What are insertion sequences?

C. Long Questions: answer the following questions (3x10=30).

1. Briefly discuss

a) Watson and Crick model of DNA	(3)
b) DNA Polymerases	(7)
2. Write brief notes on

a) SDS-PAGE	(5)
b) Gene Therapy	(5)
3. Briefly describe initiation of translation in bacteria. (10)



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Molecular Genetics II

TIME ALLOWED: 15 Mints.

Course Code: ZOO-310 Part – I (Compulsory)

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Q1. Tick/encircle the correct option (1x10=10)

1. Which site of tRNA molecule Hydrogen bonds to a mRNA molecule
 - a) Codon
 - b) 5' end of tRNA molecule
 - c) Anti codon
 - d) 3' end of tRNA molecule
2. A promoter site on DNA
 - a) Initiates transcription
 - b) Regulates termination
 - c) Codes for RNA
 - d) Transcribes repressor
3. Sigma factor is component of
 - a) DNA ligase
 - b) RNA polymerase
 - c) DNA polymerase
 - d) Endonuclease
4. Amino acids bind with the specific tRNA molecule at
 - a) Anticodon loop
 - b) T-Loop
 - c) 5' guanosine
 - d) 3' terminal adenosine
5. Most higher eukaryotic genes coding for RNA are interrupted by unrelated regions called
 - a) Introns
 - b) Exons
 - c) Hexons
 - d) red Boxes
6. Mammalian spliceosomes have sedimentation coefficient of about
 - a) 40 S
 - b) 60 S
 - c) 70 S
 - d) 80 S
7. Which mode of information transfer usually does not occur?
 - a) DNA to DNA
 - b) DNA to RNA
 - c) DNA to protein
 - d) All occur in cells
8. The major form of DNA in the cells is
 - a) A-DNA
 - b) B-DNA
 - c) C-DNA
 - d) Z-DNA
9. In arabinose operon, the operator araO₂ regulates transcription of a gene called
 - a) araO₁
 - b) araO₂
 - c) P_{BAD}
 - d) araC
10. What is the function of dideoxynucleotides in Sanger DNA sequencing?
 - a) They act as primers for DNA polymerase.
 - b) They act as primers for reverse transcriptase.
 - c) They cut the sequenced DNA at specific sites.
 - d) They stop synthesis at a specific site, so the base at that site can be determined



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Analysis of Development

TIME ALLOWED: 2 Hrs. & 45 Mints.

Course Code: ZOOL-312 Part – II

MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q. 2 Answer the following short question (10x2=20)

1. Enlist various genes involved in eye development.
2. What is cell affinity?
3. Draw fate map of mammals.
4. What is a metabolus development?
5. What is autonomous cell specification?
6. Define teratogens.
7. What is role of cadherin during development?
8. Define carcinogenesis
9. Give example of compensatory regeneration.
10. What is roll of thyroid hormone during metamorphosis.

SECTION III

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

1. What is epimorphosis? Describe epimorphic regeneration in salamanders limb.
2. Define teratogenesis? Discuss various chemicals involved in teratogenesis.
3. Write a detailed account on spinal cord development in mammals.



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Analysis of Development
Course Code: ZOOL-312 Part – I (Compulsory)

TIME ALLOWED: 15 Mints.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCO carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

- Q.1 Encircle the correct option [10]
- β -catenin is saved from destruction on the future dorsal side of amphibian embryo by
 - Dishevelled protein
 - Gooseoid protein
 - Siamesis protein
 - None of the above
 - Migration of primordial germ cells in *Xenopus* occurs through
 - Filopodia
 - Flagella
 - Cilia
 - None of the above
 - Which of the following is *not* true of anuran metamorphosis?
 - Major retinal pigment changes from porphyropsin to rhodopsin
 - T3 stimulates the growth of new tissues while T4 stimulates the regression of existing ones
 - Limb development starts earlier than tail regression
 - Position of eyes changes from lateral to frontal
 - Teratomas often contain ----- tissue.
 - Cartilage
 - Muscle
 - Fat
 - All of above
 - Eye lens is derived from -----
 - Ectoderm
 - Endoderm
 - Mesoderm
 - Both Ectoderm & Endoderm
 - Lungs are developed from -----
 - Ectoderm
 - Endoderm
 - Mesoderm
 - Pharyngeal pouches
 - Cadherins are anchored into the cell by a complex of proteins
 - Catenins
 - Noggin
 - Fibrinogen c
 - Myosin
 - When regeneration occur through repatterning of existing tissues then it is called
 - Epimorphosis regeneration
 - Morphallaxis
 - Compensatory regeneration
 - None of them
 - is important for the formation of anterior –posterior axis during mammalian development.
 - Vitamin A
 - Vitamin B
 - Vitamin D
 - Vitamin K
 - Vascular system and excretory organs are developed from -----
 - Ectoderm
 - Mesoderm
 - Endoderm
 - None of the above



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Wildlife

TIME ALLOWED: 2 Hrs. & 45 Mints.

Course Code: ZOOL-314 Part – II

MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Question #: 2

Shortly answers the following questions each questions.

(2 x 10 = 20)

- i) What is Stochastic Habitat?
- ii) Two positive values of wild life
- iii) Differentiate between endemic and exotic species?
- iv) Differentiate between home range and territory?
- v) Define Scats?
- vi) Scientific importance of wild life?
- vii) Differentiate between extinct in wild?
- viii) Define Carrying Capacity?
- ix) Two negative wild life values?
- x) what is precocious?

Question #: 3

Answer in detail the following questions.

(10 x 03 = 30)

- Q. What is the philosophy and significance of wild life?
- Q. Define and explain in detail zoo rules.
- Q. Define and explain in detail wetlands and what potential threats to wetlands.



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Wildlife

TIME ALLOWED: 15 Mints.

Course Code: ZOOL-314 Part – I (Compulsory)

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCO carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Question #: 1 Choose the right options

01. A big park where animals are kept in the open for visitors to see from their cars as they drive around:

- a) Protected area
- b) Wildlife sanctuary
- c) Safari park
- d) National park

02. A wetland of international importance declared as conservation site:

- a) Protected site
- b) Ramsar site
- c) Lagoon
- d) None of the above

03. Zoos, aquariums, sanctuaries, game farms, provide a facility for:

- a. In situ conservation
- b. Ex situ conservation
- c. Both a and b
- d. None of the above

04. Which one of the following is not a positive value of wildlife:

- a) Aesthetic value
- b) Cultural value
- c) Economic value
- d) Predation

05. Species introduced by accident or intentionally by human beings in an area:

- a) Endemic
- b) Exotic
- c) Invasive
- d) Native

06. A natural process which indicates that many hundreds of plants and animals have disappeared over the eras:

- a) Extermination
- b) Destruction
- c) Extinction
- d) Endangered

07. Substances used by man for sustenance and welfare:

- a) Reserves
- b) Resources
- c) Luxuries
- d) Benefits

08. An area where hunting and shooting of wild animals is regulated under a special permit:

- a) Game reserve
- b) Wildlife sanctuary
- c) Protected area
- d) National park

09. An animal that existed in past but is no longer present:

- a) Endemic
- b) Extinct
- c) Exotic
- d) Feral

10. Animals found in all parts of the world are known as:

- a. Endangered
- b. Cosmopolitan
- c. Endemic
- d. Vulnerable



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Environmental Biology
Course Code: ZOOL-316 Part – II

TIME ALLOWED: 2 Hrs. & 45 Mints.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q. No. 2. Give short answer to the following question (2x10)

- | | |
|---------------------|-------------------------|
| i. Animal dispersal | ii. Carrying capacity |
| iii. Acid rain | iv. Dioxin |
| v. Ecocrises | vi. Green House Effects |
| vii. MTBEs | viii. PCBs |
| ix. PAN reaction | x. Sustainability |

Q. No. 3. Describe the followings with brief answers (10x3)

- i. Disadvantages of Global Warming
 - ii. The composition of Water Pollutants
 - iii. Mechanism of Succession in growing ecosystem
-



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Environmental Biology
Course Code: ZOOL-316 Part – I (Compulsory)

TIME ALLOWED: 15 Mints.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Please encircle the correct option. Each MCQ carries 1 Mark. This Paper will be collected back after expiry of time limit mentioned above.

Q. No. 1. Fill in the square of the following for the appropriate answer (1x10)

- i. Smog is secondary pollutant formed through photochemical reaction of
 - a CFC & Ozone
 - b Soot & smoke
 - c Smoke, hydrocarbons & vapors
 - d NO₂ & Vapors
- ii. CFCs are basically involved in
 - a Noise pollution
 - b Ozone depletion
 - c Acid rain
 - d Thermal pollution
- iii. The growth in which the number of animal steadily increase in successive generation is
 - a Exponential
 - b Logistic
 - c Multiple
 - d Geometric
- iv. Corpuscular radiations are
 - a α rays
 - b β rays
 - c γ rays
 - d neutrons
- v. The most damaging sound that cause physical damage is at
 - a 20 db
 - b 65 db
 - c 85 db
 - d 120 db
- vi. Plants can absorb noise and reduce it by
 - a 10-15 db
 - b 20-30 db
 - c 10 db
 - d less than 2 db
- vii. Collecting and reprocessing a resource into new product is called
 - a recycling
 - b reuse
 - c resource depletion
 - d substitution
- viii. The units for Loudness are
 - a decibel
 - b bel
 - c microbar
 - d dyne
- ix. Troposphere is composed of
 - a mixture of N₂, O₂, CO₂, & traces
 - b Ozone
 - c CO₂ only
 - d N₂ only
- x. The main cause of Acid rain is
 - a CFCs
 - b CO₂ & H₂O
 - c SO₂ & NO₂
 - d O₃ & Vapors



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018
Examination: B.S. 4 Years

Roll No.

PAPER: Animal Behavior
Course Code: ZOOL-318 Part – II

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

Attempt this Paper on Separate Answer Sheet provided.

Q.2. Questions with Short Answers.

(2x10=20)

- i) What is Anthropomorphism?
- ii) Role of Pheromones in behaviour?
- iii) What is Zeitgebers?
- iv) What is Latent Learning?
- v) Differentiate between Classical Conditioning and Operant Conditioning?
- vi) What is allelomemetic behavior?
- vii) Differentiate between Polyandry and Polygyny?
- viii) Two types of Communication?
- ix) What is vitalistic approach to study the animal behaviour?
- x) Define acoustic behaviour?

Q.3. Questions with Brief Answers.

(3x10=30)

- I). Explain the ROLE OF GENES IN THE DEVELOPMENT OF BEHAVIOUR?
- II). What do you know about PLAY as animal behavior?
- III). Write a detailed note on PAVLOVIAN CLASSICAL CONDITIONING?



UNIVERSITY OF THE PUNJAB

Sixth Semester - 2018
Examination: B.S. 4 Years

Roll No.

PAPER: Animal Behavior
Course Code: ZOOL-318 Part – I (Compulsory)

TIME ALLOWED: 15 Min.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

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

Q.1 Encircle the correct answer from the given options to each questions (1×10=10)

1. The repetitive occurrence of same behavior is called
 - a. Bout
 - b. Event
 - c. State
 - d. Behavior
2. Synthesis of early development and findings were due to
 - a. Konlard Lorenz
 - b. I.P.Pavalov
 - c. Karl Von Frish
 - d. Parsad
3. The color which insects cannot differentiate is
 - a. Blue
 - b. White
 - c. Red
 - d. Green
4. A great need for food is called
 - a. hyperphagia
 - b. Appetite
 - c. starvation
 - d. hunger
5. Animal behaviour was described In Historia Animalia for 1st time by
 - a. Aristotle
 - b. Karl von
 - c. Darwin
 - d. Gregor Mendel
6. The branch of biology which deals with the study of behavior is called
 - a. Biology
 - b. ecology
 - c. ethology
 - d. entomology
7. Imitation is another form of
 - a. Delayed reward
 - b. Insight learning
 - c. Care
 - d. Cognition
8. Lions do which type of foraging
 - a. Active corporate
 - b. Membership
 - c. Solitary
 - d. All of these
9. An environmental agent that provides the cue for setting and resetting a biological clock
 - a. Zeitgeber
 - b. sensitizer
 - c. operant learning
 - d. migration
10. Easily locatable signals are called
 - a. Agonistic
 - b. Acoustic
 - c. Visual
 - d. Auditory



UNIVERSITY OF THE PUNJAB

Seventh Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Principal of Systematic
Course Code: ZOOL-401

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

SECTION II: SUBJECTIVE

Q2. Write short and precise answers of following questions. (2x10=20)

- i. What is biological species concepts?
- ii. Differentiate between PARAPATRIC and PERIPATRIC speciation.
- iii. Define PHENON
- iv. Differentiate between LECTOTYPE and NEOTYPE.
- v. Define SUBSPECIES.
- vi. Define BINOMIAL NOMENCLATURE.
- vii. Define CLADOGRAM.
- viii. What is LAW OF PRIORITY?
- ix. Define POLYTYPIC SPECIES.
- x. Differentiate between VALID and AVAILABLE Names.

SECTION III

QI. What is the weightage of taxonomic characters? Describe in detail those characters that have high weightage. (10)

QII. Compare the Cladistic and Evolutionary classification. (10)

QIII. Write a detail note on types of Intrapopulational variations. (10)



UNIVERSITY OF THE PUNJAB

Roll No.

Seventh Semester 2018
Examination: B.S. 4 Years Programme

PAPER: Principal of Systematics
Course Code: ZOOL-401

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

SECTION 1. OBJECTIVE

Q1. Select the most appropriate answer from the given options. Cutting and overwriting is not allowed. No mark will be awarded in case of cutting /overwriting (1 x 10)

- i. Discontinuous individual variation is:
A) Multimorphism B) Dimorphism C) Polymorphism D) Gynandromorph
- ii. The scientific name of a genus is
A) binomial B) trinomial C) uninomial D) none
- iii. What is most important on the field label of taxonomic collection
A) Date of collection B) Sex C) Name of Museum D) Exact Locality
- iv. Super species belong to -----category.
A) specific B) higher C) infraspecific D) none
- v. Names of a taxon that are spelled differently are known as
A) synonyms B) homonyms C) Antonym D) neonym
- vi. If type designated by original author in original description it will be known as
A) holotype B) lectotype C) neotype D) paratype
- vii. According to Evolutionary species concept, species is a
A) population B) phenon C) lineage D) None
- viii. A derived state in evolutionary sequence of homologous character is
A) Autopomorphies B) apomorphy C) synapomorphies D) polyphyly
- ix. Taxon is a
A) name B) rank C) group of organisms D) species
- x. Morphologically similar but reproductive isolated species are called
A) subspecies B) type species C) sibling species D) superspecies



UNIVERSITY OF THE PUNJAB

Roll No.

Seventh Semester 2018
Examination: B.S. 4 Years Programme

PAPER: Palaeontology
Course Code: ZOOL-403

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Q.1. Choose the Correct One:

{1 x 10 = 10}

- (i) Altered fossils are found in
a. Amber b. Ice c. Oil Seepage d. Sandstone
- (ii) The conversion of organic matter into stone is called
a. Petrification b. Palaeontology c. Sedimentation d. Geology
- (iii) Dinosaurs are index fossils of Era
a. Paleozoic b. Mesozoic c. Cenozoic d. Archaeozoic
- (iv) The IGNEOUS rocks produced by MAGMA called
a. Plutonic b. Volcanic c. Contact d. Regional
- (v) The geological changes underwent on earth are documented as
a. Era b. Period c. Eon d. Epoch
- (vi) The genus *HOMO* is an index fossil of Epoch
a. Pleistocene b. Holocene c. Miocene d. Pliocene
- (vii) First record of Proboscidea is known as
a. *Protylopus* b. *Protomeryx* c. *Mammuthus* d. *Moeritherium*
- (viii) The Camels and Llamas originated in
a. South America b. North America c. Africa d. Asia
- (ix) The rare fossils are found in rocks
a. Sedimentary b. Plutonic c. Metamorphic d. Volcanic
- (x) Premolars are larger than molars in
a. Horse b. Camel c. Man d. Elephant



UNIVERSITY OF THE PUNJAB

Seventh Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Palaeontology
Course Code: ZOOL-403

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q.2. Define the Following Terms: [10 x 2 = 20]

- | | |
|--------------------------------|---------------------|
| 1. Petrification | 2. Archaeopteryx |
| 3. <i>Merychippus</i> | 4. Geosphere |
| 5. Siwaliks | 6. Precambrian life |
| 7. Coprolites | 8. Paleobiology |
| 9. Volcanic and Plutonic rocks | 10. Mammoths |

Q. 3. Write short notes on the followings: [30]

- | | |
|---------------------------------|------|
| a. GEOLOGICAL TIME SCALE. | {10} |
| b. Evolutionary history of MAN. | {10} |
| c. FOSSILIZATION. | {10} |



UNIVERSITY OF THE PUNJAB

Seventh Semester 2018

Examination: B.S. 4 Years Programme

Roll No.

PAPER: Economics Zoology

Course Code: ZOOL-405

TIME ALLOWED: 2 hrs. & 30 mins.

MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q2. Write short answers of the following questions.

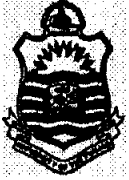
(10×2=20)

- i. Value of Mammals.
- ii. Enumerate two By-products of poultry.
- iii. Two important measures for control of House-flies.
- iv. Two recognized forms of malaria caused by different species of *Plasmodium*.
- v. Two wild species of Honeybees.
- vi. African Sleeping Sickness.
- vii. Appliances for Sericulture.
- viii. What is Rigg's disease?
- ix. Two important edible Freshwater Fishes.
- x. Control of Mosquitoes.

Q3. Write extensive answers of the following questions.

(3×10=30)

- i. Economic importance of Protozoa.
- ii. Pests of Cotton.
- iii. Lac Culture.



UNIVERSITY OF THE PUNJAB

Roll No.

Seventh Semester 2018
Examination: B.S. 4 Years Programme

PAPER: Economics Zoology
Course Code: ZOOL-405

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

1. Methods of Beekeeping for production of Honey is called:
a). Sericulture b). Apiculture Silviculture
2. DDT is:
a). A Non Degradable Pollutant b). An Antibiotic c). An Antiseptic Agent
3. Filariasis or Elephantiasis is caused by:
a). *Trichuris Trichiura* b). *Wuchereria bancrofti*
c). *Enterobius vermicularis*
4. Fasciola hepatica is commonly known as:
a). Intestinal Fluke b). Liver Fluke c). Lung Fluke
5. African Sleeping sickness is due to the parasite namely:
a). *Trypanosoma cruzi* b). *Trypanosoma gambiense*
c). *Trypanosoma rhodesiense*
6. The Straw itch or Harvest Mite is a pest of:
a). Men b). Men and Insects c). Insects
7. Pyorrhoea of Rigg's disease is caused by one of the following:
a). *Entamoeba gingivalis* b). *Entamoeba coli*
c). *Entamoeba histolytica*
8. Which of the following Honeybee is domesticated:
a). *Apis Florea* b). *Apis Dorsata* c). *Apis mellifera*
9. *Xenopsylla cheopis* is vector of one of the following diseases:
a). Plague b). Cholera c). Typhoid
10. Cultivation of Fishes in artificially prepared ponds is called as:
a). Sericulture b). Apiculture c). Aquaculture



UNIVERSITY OF THE PUNJAB

Seventh Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: General Microbiology
Course Code: ZOOL-415

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q.2 Give short answer of the following **2x10=20**

- i. Why staining techniques are used for microorganism?
- ii. Give morphological characters of alga.
- iii. Who is Leeuwenhoek? What contributions he made for Microbiology?
- iv. What is meant by endospore? Name some bacteria with endospores.
- v. Give the chemical composition of bacterial cell wall.
- vi. Why nitrogen is essential for the growth of bacteria?
- vii. What do you understand by resolving power and magnification of microscope?
- viii. Write Koch's postulates
- ix. Summarize the nutritional classification of microorganisms.
- x. What is meant by animalcules?

Q.3 Write brief note on the following **4 x 5 = 20**

- a. Classify microbes on the basis of pH.
- b. Growth curve of unicellular microorganism
- c. Characteristics and occurrence of methanogens
- d. Pure culture
- e. Synchronous growth

Q.4 Discuss differences between Gram's negative and Gram's positive bacteria **10**
with the help of labeled diagrams.



UNIVERSITY OF THE PUNJAB

Roll No.

Seventh Semester 2018
Examination: B.S. 4 Years Programme

PAPER: General Microbiology
Course Code: ZOOL-415

TIME ALLOWED: 30 mins.
MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

Q. 1 Encircle the correct answer 1x10=10

- i. Gram's staining is a type of _____ staining
 - A) Simple
 - B) Special
 - C) Differential
 - D) None of these
- ii. During this phase, the microbial cells divide steadily at a constant rate and log of the number of cells plotted against time results in a straight line
 - A) Lag phase
 - B) Exponential phase
 - C) Stationary Phase
 - D) None of these
- iii. Proof the germ theory of disease
 - A) Koch
 - B) Pasteur
 - C) Pasteur and Koch
 - D) None of these
- iv. Media developed to enhance the growth and predominance of a particular type of bacteria and to suppress the growth of unwanted microbes are called
 - A) Selective media
 - B) Enrichment media
 - C) Differential media
 - D) None of these
- v. Vaccination associated with small pox discovered
 - A) Edward Jenner
 - B) Joseph Lister
 - C) Louis Pasteur
 - D) None of these
- vi. Nitrates NO_3 that are not used by plants are reduced to gaseous nitrogen and are liberated to atmosphere by certain groups of microorganisms in a process called
 - A) Nitrification
 - B) Denitrification
 - C) Nitrogen fixation
 - D) None of these
- vii. Gram +ve bacteria retained color due to the formation of complex
 - A) CV-I
 - B) CV-II
 - C) PS-I
 - D) None of these
- viii. Bacteria that grow in the presence of 21% oxygen
 - A) Aerobic
 - B) Anaerobic
 - C) Facultative anaerobic
 - D) None of these
- ix. Numerical Taxonomy depends on
 - A) % similarity index of strains to be compared
 - B) Intuitive method of classifying bacteria
 - C) Genetic relatedness
 - D) All of these
- x. Bacterial axial filaments are also called
 - A) Pili
 - B) Stalks



UNIVERSITY OF THE PUNJAB

Seventh Semester 2018
Examination: B.S. 4 Years Programme

Roll No.

PAPER: Applied Microbiology
Course Code: ZOOL-417

TIME ALLOWED: 2 hrs. & 30 mins.
MAX. MARKS: 50

Attempt this Paper on Separate Answer Sheet provided.

Q.2 Give short answer of the following **2x10=20**

- i. Write general scheme for detection of coliform group in water.
- ii. What is meant by composting? Write its application.
- iii. Differentiate between hot sterilization and cold sterilization.
- iv. Write briefly about bacteriological filters.
- v. What is chemotherapeutic agent? Give an examples.
- vi. Write the types of infections.
- vii. Discuss discovery of penicillin briefly.
- viii. Differentiate between mode of action of dry and moist heat to control the microorganism.
- ix. Write major sources of bacterial contamination of milk.
- x. Explain the term bioremediation.

Q.3 Write brief note on the following **4 x 5 = 20**

- a. Characteristics of antibiotics that qualify them as chemotherapeutic agents
- b. Control of microorganism by low temperature.
- c. Scope of industrial biotechnology in food production.
- d. Characteristics of exotoxins and endotoxins.

Q.4 Write a detail note on wastewater treatment processes. **10**



UNIVERSITY OF THE PUNJAB

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TIME ALLOWED: 30 mins.

Course Code: ZOOL-417

MAX. MARKS: 10

Attempt this Paper on this Question Sheet only.

- Q. 1 Choose/Fill the best possible option 1x10=10
- i. The mixtures of iodine with surface-active agents act as carriers and solubilizers for iodine
 - A. Tincture of iodine
 - B. Iodo-carrier
 - C. Iodophors
 - D. None of these
 - ii. The temperature 121 °C is maintained in autoclave at
 - A. 15 pascal
 - B. 15 psi
 - C. One atmospheric pressure
 - D. None of these
 - iii. The time in minutes to reduce the population by 90% is termed as
 - A. Decimal reduction time
 - B. Thermal death time
 - C. Percent death time
 - D. None of these
 - iv. Which of the following are used on living tissues
 - A. Antiseptics
 - B. Disinfections
 - C. Antibiotics
 - D. None of these
 - v. The 5% solution of ____ used as disinfectant caused protein denaturation
 - A. Phenol
 - B. Alcohol
 - C. Halogens
 - D. None of these
 - vi. The organisms create problems of odor, color and taste or cause obstruction of water flow is considered as
 - A. Slime forming
 - B. Nuisance organism
 - C. Pilli organism
 - D. None of these
 - vii. Antibiotic having antitumor activity
 - A. Penicilin
 - B. Anthramycin
 - C. Nitrofurans
 - D. Interferon
 - viii. Erythromycin belongs to the class of antibiotics known as _____
 - A. Oxytetracycline
 - B. Macrolides
 - C. Streptomycin
 - D. None of these
 - ix. Which is most effective physical method to kill bacteria
 - A. Dry heat
 - B. Moist heat
 - C. Freezing
 - D. None of these
 - x. Example of rod shaped bacteria is
 - A. *E.coli*
 - B. *Bacillus subtilis*
 - C. *Pseudomonas*
 - D. All of these