UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: I (Biochemistry)

MAX. TIME: 3 Hrs.
MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

1a	Define the following terms with examples. a) Monosaccharides b) Anomers c) Epimers	06
1b	Give an account of pentose phosphate pathway for the generation of two important precursors for their anabolic role in various biosynthetic pathways.	09
2a	What are peptides? Describe biologically important peptides.	7.5
2b	What are fibrous proteins? Explain their structure by using the example of α keratin.	7.5
3a	What are energy producing reactions in TCA cycle? How may molecules of ATP, NADH and $FADH_2$ are produced during oxidation of one acetyl-CoA in Kreb cycle.	05
3b	How non carbohydrate precursors are converted into glucose during gluconeogenesis? Explain with the help of Cori cycle.	10
4	Define inhibitors? Describe various types of enzyme inhibition with the help of Line- Weaver-Burk plot	15
5a	How long chain fatty acids get their entry into mitochondria? Also explain the β oxidation of saturated fatty acids in mitochondria.	08
5b	Discuss the production of Urea in liver cells.	07
6	Give an account of the electron transport chain from NADH to cytochrome c oxidase complex. Also discuss different complexes of electron transport chain.	15
7a	Describe the biosynthesis of fatty acids in animal cells. Also mention why most of the fatty acids have even number of carbon atoms?	09
7b	What are ketone bodies and why they are produced more during starvation?	06
8	Describe the reactions of glycolysis and discuss its anabolic role in various processes.	15
9	Write a note on any two of the followings. a) Structurally important homopolysaccharides. b) Alpha and omega oxidation of fatty acids. c) Different types of membrane lipids.	7.5X2 =15

UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology

PAPER: II (Cell & Molecular Biology)

MAX. TIME: 3 Hrs.

MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks.

1. What is the difference between Mutagens and carcinogens? Describe different types of repair mechanism that exist in the cell. 15
2. Give a comprehensive account of the Genetic code and its properties. 15
3. Describe the structure of a gene in prokaryotes. Explain the process of transcription in Prokaryotes 15
4. Define polycistronic mRNA. Explain the process of regulation of a Anabolic (Trpoperon) gene expression in prokaryotes. 15
5. What are Cyclins and CDKs? Describe how the cell cycle is regulated. 15
6. Give a comprehensive account of the structure of Ribosomes. 15
7. Explain the process of Translation (with reference to the specific role of Ribosomes, various factors). 15
8. Write a note on Microfilaments. Discuss the function of Actin and myosin filaments. 15
9. Write notes on the followings 7.5x2=15
   a. tRNA
   b. UsNRNPs

UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology

PAPER: III [Genetics and Biostatistics (Weightage 3:1)]

MAX. TIME: 3 Hrs.

MAX. MARKS: 75

NOTE: Attempt any THREE Questions from Part I and TWO Questions from Part II. Simple calculators and Statistical Tables are allowed.

Part – I

Q 1	a	Discuss the factors affecting Hardy Weinberg Equilibrium Theory.	10
	b	Write a detailed note on inbreeding and heterosis.	7
Q 2		Discuss various types of transposons in bacteria. Draw the structure of "**Tn elements**".	10
		What is the balance theory of sex determination in Drosophila?	7
Q 3		Write an essay on polyploidy why polyploidy is not successful in animals?	17
Q 4		What is linkage? How would you differentiate linkage from Independent assortment? Discuss with the help of example.	10
		What is transduction? Please compare the generalized and specialized transduction.	7
Q 5		Explain DNA repair mechanism.	10
		Write a note on tools of genetic engineering.	7
Q 6		Differentiate between the following a. Expressivity and penetrance 3 b. Multiple allelic and polygenic characters 2 c. Auxotroph and prototroph. 3 d. Episome and Plasmid 3 e. Hfr3 f. Negative and positive assertive mating 3	17

Part – II

Q 7	a	Following is data of weight of mice (gm) calculate mean, standard deviation, coefficient of variation and confidence interval.	12

Observation	34	36	38	40	42	44	46
Frequency	1	1	2	6	4	3	3

Q 8		Following is the data of body weights (g) of mice kept at two different diets. Is there enough evidence to support the hypothesis that the diets have no effects on body weight? (Note: Assume equal variance in the two groups).			12

Gorup 1	20	25	30	35	40
Group 2	40	35	33	30	37

Q 9		The following table gives the results of 2 drugs formulated for the control of blood pressure. Find if the 2 drugs have similar activity, write down all steps involved.			12

Drug	Patients recovered	Patients not recovered
A	200	60
B	160	20

UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology

PAPER: IV (Physiology)

MAX. TIME: 3 Hrs.

MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks. Elaborate your answer with labelled diagrams and flow charts.

Q. 1.	Describe, in detail, the mechanism of action of a protein/peptide hormone through cAMP second messenger system.	15
Q. 2.	a) Discuss the role of Ca^{2+} in attachment of cross bridges during muscle contraction.	09
	b) Differentiate between isotonic and isometric muscle contractions.	06
Q. 3.	Give a detailed account of the sense of smell (olfaction) and taste (gustation) with their mechanism of transduction.	15
Q. 4.	a) Describe in detail the mechanism of elicitation of an action potential.	11
	b) Highlight the specific properties of action potential.	04
Q. 5.	a) Highlight the specific differences in the mechanism of synaptic transmission at an electrical synapse and a chemical synapse.	06
	b) Elaborate the transmission of nerve impulse with special reference to a neuromuscular junction.	09
Q. 6.	Account, in detail, the mechanisms in self excitation and automatic rhythmicity of a myogenic heart.	15
Q. 7.	Elaborate the role and interaction of parathyroid hormone, calcitonin and vitamin D in the regulation of calcium and phosphorous.	15
Q. 8.	Discuss oxygen dissociation curve and explain the effect of various factors on its behavior.	15
Q. 9.	a) Discuss the mechanism of glomerular filtration with various factors involved.	08
	b) Brief various steps in the absorption of carbohydrates in gastrointestinal tract in mammals	07

UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology

PAPER: V (Developmental Biology)

MAX. TIME: 3 Hrs.

MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks. Make labeled sketches to support your answers where ever necessary.

Q. 1. WRITE A DETAILED ACCOUNT ON **FERTILIZATION** IN MAMMALS

Q. 2. WRITE A COMPREHENSIVE NOTE ON **MORPHOGENESIS**. DISCUSS THE ROLE OF **CADHERINS** DURING MORPHOGENESIS.

Q. 3. DISCUSS THE DEVELOPMENT OF EYE FOCUSING ON **INDUCTION** OF **LENS.**

Q. 4. DESCRIBE **SPERMATOGENESIS**. HOW A SPERMATID IS MODIFIED INTO MATURE SPERM?

Q. 5. GIVE A DETAILED ACCOUNT ON **OOGENESIS** IN BIRDS AND MAMMALS.

Q.6. WHAT ARE **FATE MAPS**? DESCRIBE THE VARIOUS PROCESSES USED IN THE CONSTRUCTION OF FATE MAPS. HOW DO THEY HELP IS UNDERSTANDING OF THE PROCESS OF DEVELOPMENT?

Q. 7. WRITE A COMPREHENSIVE NOTE ON **CLEAVAGE** AND **GASTRULATION** IN **BIRDS.**

Q. 8. DISCUSS **AMPHIBIAN METAMORPHOSIS**; ALSO EXPLAIN ITS HORMONAL CONTROL.

Q. 9. WRITE NOTES ON THE FOLLOWINGS

I. CLASSIFICATION OF EGGS ON THE BASIS OF AMOUNT AND DISTRIBUTION OF YOLK

II. MORPHOGENETIC MOVEMENTS

III. MONOZYGOTIC TWINS

UNIVERSITY OF THE PUNJAB

Part-I : Supplementary Examination 2018

Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology

PAPER: VI [Animal Diversity and Wild Life (Weightage 4:1)]

MAX. TIME: 3 Hrs.

MAX. MARKS: 75

NOTE: Attempt any FIVE questions. Select minimum TWO from each Section. All questions carry equal marks.

SECTION I

Question 1. Write comprehensively about hierarchical organization of animal diversity, complexity and body size, animal body plan and symmetry 15

Question 2. Write down adaptations in animals against harsh climate in the following ecosystems? 5x3

i- Tundra biome
ii- Desert biome
iii- Freshwater ecosystems

Question 3. Discuss in detail the phylogenetic relationship between Porifera, Coelenterates and Platyhelminthes. 15

Question 4. How evolutionary trends proceeded among the Chordates? Also describe briefly their evolutionary ties with the hemichordates and echinoderms. 15

Question 5. a. Write down classification and diagnostic features of amphibians and reptiles. 8

b. Differentiate between Deuterostomes and Protostomes 7

SECTION II

Question 6. Define the followings: 1x15

Zoological park, zoological museum, habitat, home range, safari park, endangered species, extinct species, threatened species, territory, biodiversity, native species, endemic species, carrying capacity, feral animals, predator

Question 7. a) Differentiate between ex-situ and in-situ conservation. 7

b) What are National Parks? Write a detailed note any two of them. 8

Question 8. a) Describe criteria on the basis of which a wetland is classified as Ramsar site? 7

b). Define protected area and various IUCN categories of protected areas. 8

Question 9: Write short notes on following threatened animals of Pakistan 5x3

Urial, Snow Leopard, Houbara Bustard