UNIVERSITY OF THE PUNJAB

Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: II (Evolution and Principles of Systematic Zoology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt FIVE questions: THREE from Part A and TWO from Part B.

Serial No.	*Questions*	*No. of Marks*
	PART A	
Q1	Why adaptations are imperfect? Describe in detail	15
Q2	Describe role of mutation, genetic drift and inbreeding in microevolution.	15
Q3	Discuss theories of phyletic gradualism and punctuated equilibrium in the light of rates of evolution.	15
Q4	Describe theories of sexual selection in detail.	15
Q5.	Write a detail note on Fitness and its measurements in two locus selection model.	15
	PART B	
Q6 (a)	Describe Evolutionary species concept and difficulties in its application.	8
(b)	Discuss the concept of weightage of Taxonomic characters.	7
Q7 (a)	Discuss the concept of Allopatric speciation	8
(b)	Describe the conditions which affect stability of nomenclature of taxa.	7
Q8 (a)	Discuss the importance of taxonomic collection.	7
(b)	Describe major types of intra population variations	8
Q9.	**Write notes on**	5x3
(a)	Law of priority	
(b)	Cohesion species concept	
(c)	Types of classification	

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: III (Zoogeography & Principles of Palaeontology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt any FIVE questions. Select at least TWO questions from each part. All questions carry equal marks.

Part- I (Paleontology)

Q 1: Write note on the following; (a) *Hipparion* (b) *Hyracotherium* (c) *Equus* **(5+5+5) 15**

Q 2: Write a note on the Middle and Upper Siwaliks subgroups **15**

Q 3: What is Geochronology and how it can be used to measure the age of rocks **15**

Q 4: Explain the following; (a) Dinosaurs(b) *Archeaopteryx* (c) *Elephas* **(5+5+5) 15**

Q 5: Explain in detail the Metamorphic Rocks and Sedimentary Rocks **(8+7)15**

Part- II (Zoogeography)

Q 6: Describe and discuss in detail the Plate Tectonic Theory **15**

Q 7: Discuss Zoogeographical Features, Climate and Fauna of Oriental Region **15**

Q 8: Explain different types of Islands with some suitable examples in each case **15**

Q 9: Write note on the following; (a) Zoogeographical Regions (b) Types of Barriers **(8+7) 15**

Q 10: Give the Zoogeographical Distribution of the following animals;

(i) *Bison* (ii) *Apteryx* (iii) Tree Frog (iv) *Sphenodon* (v) Kangaroo

(vi) *Zaraffa* (vii) Crocodile (viii) *Gorilla* (ix) *Lepidosiren* (x) *Typhlops* **(1.5 each) 15**

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-IA (Entomology 'A')
[Morphology, Physiology & Ecology]

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.1	What do you understand by aerodynamic theory of insect flight? How does wing coupling takes place in insects.?	15
Q.2	Discuss in detail the reasons of success of insects in diverse environment.	15
Q.3	Describe the digestive system of honeybee with labelled diagram.	15
Q.4	Differentiate between the following i. Nymph and larva ii. Trachea and Tracheoles iii. Insect and pest iv. Parasite and Predator v. Hemimetabola and Holometabola	15 (5x3)
Q.5	Write notes on a. Biological significance of the sound production in insects b. Describe the mechanism of sound produced by *Cicada*	15 (7+8)
Q.6	Write down different types of reproduction in insects.	15
Q.7	Discuss the functions of body colours in insects with special reference to pigmentary colours.	15
Q.8	Compare the male and female reproductive organs of insects.	15
Q.9	Describe in detail different types of metamorphosis in insects.	15

PTO for Urdu Version

کوئی سے پانچ سوال حل کریں۔ ہر سوال کے نمبر برابرہیں

س۱	حشرات کی پرواز میں ایروڈائنا مک تھیوری کیا ہے؟ حشرات میں پرو ں کا کپلنگ کیسے ہوتا ہے۔	۱۵
س۲	ماحولیاتی تغیر میں حشرات کی بقا کا راز تفصیل سے بیان کریں	۱۵
س۳	شہد کی مکھی کا نظام انہضام لکھیں۔شکل بنائیں اور اعضاء کے نام لکھیں	۱۵
س۴	درج زیل میں فرق بیان کریں ۱۔نیمف (nymph)اور لاروہ ۲۔ٹریکیا اور ٹریکیول ۳۔عام کیڑا اور نقصان دہ کیڑا ۴ طفیلیہ اور د شمن کیڑا ۵.ہیمی میٹا بولا اور ہولومیٹابولا	۱۵ (۳x۵)
س۵	درج ذیل پر نوٹ لکھیں ۱۔ ماحول میں حشرات کی آواز کی اہمیت ۲۔ بنڈا(*Cicada*) کا آواز پیدا کرنے کا عمل	۱۵ (۸+۷)
س۶	حشرات میں افزآئش نسل (reproduction) کی مختلف اقسام بیان کریں	۱۵
س۷	حشرات میں رنگوں کا امتزاج بحوالہ (pigmentary colours) اور انکا کام بیان کریں	۱۵
س۸	حشرات میں نر اورمارہ تولیدی اعضاء کا موازنہ کریں	۱۵
س۹	حشرات میں (metamorphosis)کی مختلف اقسام بیان کریں	۱۵

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-3A (Physiology -A) {Physiology of Coordination}

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks. Support your account with illustration's where necessary.

Q. 1.	Discuss, in detail, the structure and function of G Protein-Coupled receptors.	15
Q. 2.	In Cell-signaling pathways, describe, with the help of a G-protein cycle, the involvement of GTP-binding proteins as switches that turn the activities on or off.	15
Q. 3.	Comprehensively, describe the characteristic features of Idiopathic nontoxic colloid goiter and Cretinism.	15
Q. 4.	Give a detailed account of hypo-parathyroidism and primary hyper-parathyroidism.	15
Q. 5.	a) Give a detailed account of sliding filament mechanism of muscle contraction.	9
	b) Briefly describe the functions (any three) of muscular tissue	6
Q. 6	a) Write a note on adrenal cortex and its hormones	9
	b) Give endocrine functions of liver, heart and adipose tissues	6
Q.7.	a) Give a detailed account of generation of action potential in a neuron	10
	b) Write a note on aging of muscular system	5
Q. 8.	Describe, in detail, the conduction of a nerve signal in an unmyelinated and a myelinated nerve fiber	15
Q. 9.	Give a comprehensive account of Grand Mal Epilepsy and Focal Epilepsy	15

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-3B (Physiology 'B')
[Physiological systems and adaptations]

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.1 Explain the functional anatomy and regulation of duodenum; also explain its role in digestion and absorption.

Q.2 Explain role of Renin-Angiotensin-Aldosteron system (RAAS) in regulation of electrolytes homeostasis focusing on Hypertension.

Q.3 Explain structure and function of Liver in detail.

Q.4 Describe fine structure and functions of renal corpuscle.

Q.5 Describe secretions of slivery glands and their role in digestion.

Q.6 what are coronary arteries? Explain atherosclerotic lesions in detail.

Q.7 Write a note on structural and functional importance of Respiratory and olfactory regions of nasal cavity.

Q.8 Describe the structure of heart also explain the cardiac cycle and its regulation in detail.

Q.9 Write note on the following:

a) Cystic Fibrosis

b) Emphysema and Pneumonia

c) Respiratory Bronchioles

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-IB (Entomology 'B')
[Classification of Insects and Pest Management]

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt FIVE questions selecting THREE from section-I and TWO from Section-II

SECTION-I

Q.1. a) What are the diagnostic features of Hemiptera? 3,12
b) Describe important features and economic importance of any three families of Lepidoptera.

Q.2. a) Differentiate between Hymenoptera and Isoptera / Blattodea. 3,12

b) Give diagnostic features and economic importance of the followings: 15

i) Brachonidae ii) Tabanidae iii) Bostrychidae

Q.3. Describe details of the followings: 15
i) Dermaptera ii) Collembola

Q.4. a) What are diagnostic characters of Isoptera? 3,12
b) Compare and contrast social organization of isopteran and Hymenoptera.

Q.5. Write notes on the followings: 15
i) Thysanoptera ii) Strepsiptera

SECTION-II

Q.6. a) What is meant by integrated pest management (IPM)? 3,12
b) Describe different strategies involved in integrated pest management.

Q.7. Give details of organochlorine insecticides. 15

Q.8. Discuss different sampling techniques in insect pest management. 15

Q.9. Write note on household pests and management. 15

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-6A (Fisheries 'A')
[Principles of Fish Biology]

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q. # 1: Compare the taxonomic characters of family CYPRINIDAE and SILURIDAE.

Q. # 2: Describe various TYPES and MODIFICATIONS of SCALES in fishes, draw the labeled diagrams.

Q. # 3: Discuss HEART and BLOOD in fishes, draw labeled diagrams also.

Q. # 4: Write a note on the different FEEDING MODIFICATIONS of mouth and major FEEDING GROUPS in fishes.

Q. # 5: Describe FRESHWATER ECOSYSTEM with reference to fish distribution.

Q. # 6: Give detailed account of 'APPENDICULAR FIRM SKELTON' in fish.

Q. # 7: Describe the structure of GILLS and EYE in fish, sketch the diagrams also.

Q. # 8: Write a note on SWIM BLADDER, LATERAL LINE and GONADES in fishes.

Q. # 9: Write a note on the following:
a) Barbells in fishes
b) Tilapia Culture

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: IV-6B (Fisheries 'B')
[Fish Physiology and Breeding]

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q. 1 (a)	Give an account on growth of fishes in relation to consumption of neutral and artificial food.	8
(b)	Discuss hypo-osmotic and hyper-osmotic urine in fishes.	7
Q. 2 (a)	Discuss blood circulation in fishes.	8
(b)	Give an account on role of gills in gas exchange.	7
Q. 3 (a)	Describe the induce breeding in cyprinids.	8
(b)	Explain the spermatogenesis in fishes	7
Q. 4 (a)	Describe the structure and function of kidney in freshwater fishes.	8
(b)	Write a note on digestion and absorption in cyprinids	7
Q. 5 (a)	Give an account on organogenesis in fishes.	8
(b)	Write a detail account on feeding adaptations in fishes.	7
Q. 6 (a)	Write a note on pituitary gland in fishes.	8
(b)	How lungfishes are adapted to aerial environment.	7
Q. 7 (a)	Compare the digestive systems of herbivorous and carnivorous fishes. Draw suitable sketches to support your answer.	8
(b)	Give an account on skin in fishes.	7
Q. 8 (a)	Describe the factors influencing migratory movement in fishes.	8
(b)	How water quality parameters affect on growth of fishes? Discuss	7
Q. 9	Write a short note on the following	
	a) Osmoregulation in elasmobranchs	5
	b) Diadromous fishes	5
	c) Extensive fish culture	5

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-1 (Integrated Pest Management)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q. 1. How can you divert the pest population away from the crop using TRAP CROP and INTER CROP methods?

Q. 2. What are the benefits and risks of TRANSGENIC CROPS?

Q. 3. Discuss role of PARASITES, PARASITOIDS and PREDATORS as biological control agents?

Q. 4. Discuss different kinds of PESTS in detail?

Q. 4. Give a detailed account on ORGANOCHLORINES?

Q. 5. Discuss AUGMENTATION with reference to the natural enemy?

Q.6. what is the influence of BIOLOGICAL and PHYSICAL factors mediating the expression of resistance?

Q. 7. Give an account on the ROLE OF SANITATION and TILLAGE in ecological management?

Q. 8. What are the PEST MANAGEMENT STRATEGIES and TACTICS?

Q. 9. Write short notes on the following

i. Carbamates
ii. Synchronization
iii. Carrying capacity

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-3 (Classification of Insects, Pest of Agriculture and Pest Management)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: ***Attempt any FIVE questions selecting THREE from Section – I and TWO from Section – II.***

SECTION-I

Q.1. a) What are the diagnostic features of Diptera? (3,12)
b) Describe important features and economic importance of any three families of Diptera.

Q.2. a) Differentiate between Hemimetabola and Holometabola. (3,12)
b) Give diagnostic features and economic importance of the followings:
i) Ostridae ii) Tabanidae iii) Formicidae

Q.3. Describe details of the followings: (15)
i) Embioptera ii) Isoptera/Blattodea

Q4. Give an account of economically important insects that attack cotton.(15)

Q.5. Write notes on the followings: (15)
ii) Dermaptera ii) Odonata

SECTION-II

Q.6. a) What is meant by integrated pest management? (3, 12)
b) Describe different strategies involved in integrated pest management.

Q.7. Give details of organochlorine insecticides and their mode of action and effects. (15)

Q.8. Discuss different biological control agents and their benefits. (15)

Q.9. Write notes on the household pests and their management. (15)

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-7 (Molecular and Clinical Endocrinology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt any FIVE questions. All questions carry equal marks. Support your account with illustrations , where necessary.

Q. 1.	Give a detailed account of Panhypopituitarism and Gigantism.	15
Q. 2.	Give a comprehensive account causes, symptoms and treatment of Hyperthyroidism.	15
Q. 3.	Account, comprehensively, the Phospholipids derived second messenger system.	15
Q. 4.	Give a detailed account of Addison's Disease.	15
Q. 5.	a) Describe the role of pineal gland in controlling seasonal fertility in some animals.	09
	b) Briefly account testicular tumors and hypergonadism in the male	06
Q. 6	Describe, in detail, the causes and consequences of rickets in children.	15
Q.7.	Write notes on the following:	
	a) Physiology of diagnosis of diabetes	8
	b) Insulinoma	7
Q. 8.	Describe, in detail, the role of GTP binding proteins in cell signaling.	15
Q. 9.	Discuss, comprehensively, the structure and function of G Protein-Coupled receptors	15

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-16 (Applied Fisheries)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.1 a) Write a comprehensive note on fish pond fertilization.

b) What types of natural food are present in fish pond other than planktons? (10,9)

Q.2 a) Describe Induced Breeding in Carps.

b) Write a note on the Formulation of Artificial Fish Feed. (10,9)

Q.3 Draw, label and describe components of a typical, semi-excavated, earthen fish pond. How pond productivity and supplementary feed helps in maximization of fish yield in a polyculture system? (12,7)

Q.4 a) How mono sex tilapia seed production differs from a typical carp seed production?

b) Differentiate between GIFT and GMT (tilapia) technologies? (9,10)

Q.5 a) How extensive aquaculture is different from intensive aquaculture?

b) What is the difference between mono and poly-culture systems? (10,9)

Q.6 a) How pond liming improves water quality in a fish pond?

b) Why earthen ponds require manuring and fertilization? (9,10)

Q.7 Write short note on the following (5,4,5,5)

a) Water quality

b) Integrated aquaculture

c) Aquatic weeds and their control

d) Common bacterial diseases of carps

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology **TIME ALLOWED: 3 hrs.**
PAPER: V-17 (Biological and Chemical Control of Insects) **MAX. MARKS: 75**

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

Q1.		Give detail account of any two insect pests of cotton.	15
Q2		Explain types of insecticides on the basis of their mode of application.	15
Q3		Explain in detail the ecological factors which should be kept in mind for colonizing a natural enemy.	15
Q4			
	a	Compare and contrast super parasitism and multiple parasitism.	10
	b	What is difference between predator from a parasitoid?	5
Q5.	a	Write notes on the fumigants.	10
	b	How insecticides affects beneficial arthropods.	5
Q6.		Why insect develop resistance against chemical pesticides?	15
Q7.		Classify the following insects (1). Pink Bollworm (2). Fall Armyworm (3). Rice Hispa (4). White bore of rice (5). Leaf folder of rice	15
Q8.		How we can enhance density of natural predators in agro-ecosystems?	15
Q9.		Write conceptual definition of the following terms	15
	a	Generalist predator	
	b	Economic Injury Level	
	c	Active ingredient.	

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-17 (Fish Disease & Health Management)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.No.1	Write Descriptive note on Saprolegnia infection in fishes and its treatment?	(15)
Q.No.2	Describe Spring Veremia of Carp and its treatment?	(15)
Q.No.3	Explain Infectious hematopoietic necrosis in salmon.	(15)
Q.No.4	Abdominal Dropsy is a serious bacterial disease, Describe:	(5+5+5)
	i. Causative agent	
	ii. Pathology	
	iii. Control & Treatment	
Q.No.5	Explain Gyrodactylosis in fish and its treatment.	(15)
Q.No.6	What do you know about various ecological diseases in fishes and their control? (15)	
Q.No.7	Explain Trichodinosis in fishes and its treatment.	(15)
Q.No.8	Describe Lernaeasis diseases in Carps and its treatment?	(15)
Q.No.9	Write note on the following:	(7.5 + 7.5)
	i. Argulus Sp	
	ii. Oodinium Sp	

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

Roll No. .....

Subject: Zoology **TIME ALLOWED: 3 hrs.**
PAPER: V-18 (Fundamentals of Microbiology) **MAX. MARKS: 75**

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

Q. 1	Give a comprehensive note on history of microbiology as a foundation of the modern science.	15
Q. 2	Differentiate between cell walls of Gram positive bacteria and Gram negative bacteria.	15
Q. 3	a- Give grouping of bacteria with respect to their optimum pH.	05
	b- Describe different methods of maintenance and preservation of bacterial cultures.	10
Q. 4	a- Discuss different nutritional types of bacteria with respect to their carbon and energy sources.	10
	b- Mention different modes of bacterial cell division.	05
Q. 5	Discuss different types of media and their specific applications.	15
Q. 6	Discuss growth cycle of bacteria in detail.	15
Q. 7	a- Describe the importance of Lichens.	05
	b- Discuss about continuous bacterial cultures and their importance	10
Q. 8	a- Discuss biological and economic importance of algae.	10
	b- Discuss the importance of protozoa.	05
Q. 9	Write notes on the followings.	
	a- Type strain	05
	b- Cultivation of animal viruses	05
	c- synchronous growth	05

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-20 (Mammalogy)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt any FIVE questions. Each question carries equal marks.

1	Give an account of the structural peculiarities and distribution of Placental Mammals.	15
2	a- Movement patterns of Mammals. b- Define and explain Territory and Territoriality.	2 x 7.5 =15
3	Write notes on the following. a- Rumination in mammals b- Differentiate between Hibernation and Aestivation	2 x 7.5 =15
4	Give distinguishing characters of:- a- Symmetrodonta b- Triconodonta c- Multituberculata	3 x 5 =15
5	Differentiate between the following:. a- Cetacea and Sirenia b- Pholidota and Lagomorpha	2 x 7.5 =15
6	Discuss Evolution of mammalian Molar with examples	15
7	Give the characteristics which separate the Marsupial from Monotremes.	15
8	Write Order and Distribution of the following mammals. a- Pikas f- Armadillo b- Bat g-Panda c- Snow Leopard h- Porcupine d- Markhor i- Dugong e- Okapi j- Flying Squirrel	10x1.50=15
9	Discuss the following. a- Food and food storage in mammals b- Echolocation in bats	2 x 7.5=15

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-22 (Vector Biology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q1. Describe the life cycle of the malarial parasite in the vector and in the human. [15]

Q2. Write short notes on the following: [15]

i. Loiasis
ii. Dengue fever
iii. Onchocerciasis

Q3. Discuss Morphology, Life cycle and Control of Black flies? [15]

Q4. Discuss different types of myiasis and their causative agents. [15]

Q5. Explain different control strategies for the following? [15]

i. Sand flies
ii. Tsetse flies

Q6. a. What are the different control strategies directed at immature stages of mosquitoes? [15]

b. Discuss different types of Leishmaniasis?

Q7. Discuss Morphology, Life cycle and Control of Green bottle flies? [15]

Q8. Give Medical Importance of the following: [15]

i. Black flies
ii. Horse flies

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-26 (Human Embryology & Teratology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q1. DESCRIBE THE PROCESS OF CLEAVAGE AND GASTRULATION IN HUMANS

Q2. DISCUSS DRUGS AS **ENVIRONMENTAL TERATOGENS,** BRIEFLY STATE THEIR MECHANISMS OF TERATOGENESIS

Q3. DESCRIBE THE **DEVELOPMENT OF HUMAN OVARY** EMPHASIZING THE ORIGIN OF PRIMORDIAL GERM CELLS

Q4. DESCRIBE THE **DEVELOPMENT OF SPINAL CORD** IN HUMANS ALSO DISCUSS THE MAJOR ANOMALIES ENCOUNTERED IN THIS ORGAN

Q5. DESCRIBE THE **DEVELOPMENT OF HEART** HIGHLIGHTING THE ORIGIN OF MAJOR CONGENIAL DEFECTS OF THIS ORGAN

Q6. GIVE A COMPREHENSIVE ACCOUNT OF THE **ORIGIN AND DIFFERENTIATION OF HUMAN LUNGS** ALSO DISCUSS THEIR DEVELOPMENTAL ANOMALIES.

Q7. DISCUSS IN DETAIL THE PROCESS OF **OOGENESIS** IN HUMANS

Q8. WRITE AN EXPLANATORY NOTE ON THE NORMAL **DEVELOPMENT OF VERTEBRAL COLUMN** AND ITS DEPARTURES IN HUMAN EMBRYO

Q9. WRITE NOTES ON ANY TWO OF THE FOLLOWING

i. SECONDARY NEURULATION
ii. SPERMIOGENESIS
iii. EXTRA EMBRYONIC MEMBRANES

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Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-30 (Virology & Viruses)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.1.	Enlist the categories of viral genome. Describe the helicle symmetry of viral structure.	18.75
Q 2.	Give a detailed description how virion membranes are formed during assembly of helical and icosahedral viruses.	18.75
Q 3.	What is open reading frame. Explain the translation of viral genes in the eukaryotic host cells.	18.75
Q 4.	Define a gene. Explain the transcription in viral genome.	18.75
Q.5.	Enlist different cellular locations for viral genome replication. Give a comprehensive account on the viral genome replication.	18.75
Q 6.	Define immunity? Explain the life cycle of HIV Human immunodeficiency virus.	18.75
Q. 7.	Viruses a nucleoprotein. Describe the types of viral symmetry and explain virus structure and genetic composition.	18.75

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TIME ALLOWED: 3 hrs.

UNIVERSITY OF THE PUNJAB

Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-21 (Immunology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q. No.	Question	Marks
1	What are complements and explain the classical pathway of complementation activation.	15
2	Define antibody. Describe the structure and function of IgG. Also compare the structure of IgM, IgG and IgA.	15
3	Give an experimental evidence that antigen presentation is key of T-helper cell activation	15
4	Discuss the properties of activated macrophages. How they are superior than resting one? Discuss the mechanisms through which they destroy the phagocytosed microorganism	15
5	Describe the structure and function of class I MHC molecules and class II MHC molecules.	15
6	Define antigens. Describe the factors affecting immunogenicity of an antigen.	15
7	Enlist various immunodiagnostic techniques. Explain principal and procedure of different types of ELISA	15
8	What are monoclonal antibodies how they are synthesized?	15

کوئی سے پانچ سوال حل کریں۔ ہر سوال کے نمبر برابرہیں

س۱	پاکستان میں مگس بانی بطورد یہی صنعت کی اہمیت بیان کریں	۱۵
س۲	نحل پروری کے آلات سے متعلق تفصیل بیان کریں	۱۵
س۳	شہد کی مکھیوں میں خاندانی تنظیم بیان کریں	۱۵
س۴	درج زیل پر مختصر نوٹ لکھیں ۰۱ زرگل ۰۲نحلی سریش ۰۳ نحلی موم ۰۴رائل جیلی ۵.نحلی زہر	۱۵ (۳x۵)
س۵	ملک میں سیاری مگس بانی پرروشنی ڈالیں	۱۵
س٦	درج ذیل پر نوٹ لکھیں ۰۱ اضافی خوراک ۰۲ملکہ کی افزائش ۰۳ شہد کی زیا دہ پیداوار کیلیے امور	۱۵ (۵x۳)
س۷	درج زیل پر مختصر نوٹ لکھیں ۰۱ موم کے بنیادی چھتے ۰۲ ڈ رون بروڈ ۰۳ملکہ روک تختہ ۰۴ملکہ کا قفس ۵. دھونکنی	۱۵ (۳x۵)
س۸	شہد کی مکھیوں کی بیماریوں پرجامع نوٹ لکھیں	۱۵
س۹	پاکستان میں حشرات سے عمل زیرگی پر منحصر پھلدار پودوں اور فصلات پر روشنی ڈالیں	۱۵

UNIVERSITY OF THE PUNJAB

Part-II A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Zoology
PAPER: V-39 (Apiculture)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

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

Q.1	Discuss briefly Apiculture as cottage industry in Pakistan.	15
Q.2	Give brief account on beekeeping equipment	15
Q.3	Explain organizational setup of honeybee colony	15
Q.4	Write notes on i. Pollen ii. Propolis iii. Bees wax iv. Royal jelly v. Bee venom	15 (5x3)
Q.5	Discuss briefly migratory beekeeping in the country.	
Q.6	Write notes on i. Supplemental feeding ii. Queen breeding iii. Measures for high honey harvest	15 (3x5)
Q.7	Write notes on i. Wax comb sheets ii. Drone brood iii. Queen excluder iv. Queen cage v. Smoker	15 (5x3)
Q.8	Explain diseases of honeybees in Pakistan.	15
Q.9	Give brief account on honey bee pollinated fruit trees and crops in Pakistan.	15

PTO for Urdu Version

کوئی سے پانچ سوال حل کریں۔ ہر سوال کے نمبر برابر ہیں

س۱	پاکستان میں مگس بانی بطورد یہی صنعت کی اہمیت بیان کریں	۱۵
س۲	نحل پروری کے آلات سے متعلق تفصیل بیان کریں	۱۵
س۳	شہد کی مکھیوں میں خاندانی تنظیم بیان کریں	۱۵
س۴	درج زیل پر مختصر نوٹ لکھیں ۰۱ زرگل ۰۲نحلی سریش ۰۳ نحلی موم ۰۴رائل جیلی ۵.نحلی زہر	۱۵ (۳x۵)
س۵	ملک میں سیاری مگس بانی پرروشنی ڈالیں	۱۵
س۶	درج ذیل پر نوٹ لکھیں ۱ ۰ اضافی خوراک ۰۲ملکہ کی افزائش ۰۳ شہد کی زیا دہ پیداوار کیلیے امور	۱۵ (۵x۳)
س۷	درج زیل پر مختصر نوٹ لکھیں ۰۱ موم کے بنیادی چھتے ۰۲ ڈرون بروڈ ۰۳ملکہ روک تختہ ۰۴ملکہ کا قفس ۵. دھونکنی	۱۵ (۳x۵)
س۸	شہد کی مکھیوں کی بیماریوں پرجامع نوٹ لکھیں	۱۵
س۹	پاکستان میں حشرات سے عمل زیرگی پر منحصر پھلدار پودوں اور فصلات پر روشنی ڈالیں	۱۵