



UNIVERSITY OF THE PUNJAB

B.A. / B.Sc. (Composite) Annual Exam - 2019

Subject: Zoology
PAPER: A

MAX. TIME: 1 Hr.
MAX. MARKS: 25

Roll No. in Fig.

Roll No. in Words.

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.

Part - I

Q1 Mark true or false statements, give correct statement if it is false (1/2 X 10=05).

S#	Statement	T/F	Correct Statement
1	The loss of an enzyme's shape is called renaturation.		
2	NAD ⁺ is in its reduced form.		
3	The breaking of one high-energy bond in ATP releases approximately 30- kcal of energy		
4	The term tonicity refers to the relative concentration of solvent in the water inside and outside the cell.		
5	When the electrons reach the end of the electron transport chain, an oxygen molecule accepts the electrons and combines with hydrogen to generate a molecule of Alcohol		
6	Coenzyme A is necessary for pyruvate to enter aerobic respiration		
7	Preparing and examining slides and photographs of metaphase chromosomes is called Linkage Analysis.		
8	Genetic drift is most likely to occur in large populations		
9	An adaptation present in an organism in one environment will always help it in another environment.		
10	In the human XY system of sex determination, the fertilization of a normal egg by a Y-containing sperm cell would result in a female offspring.		

Q2. Choose the best choice for the statement by encircling from multiple choices given below (1/2 X 20=10).

- Which of the following is a cofactor?
a. Magnesium ions b. Manganese ions c. Copper ions d. All of above
- A typical food chain consists of
a. Primary consumers b. Secondary consumers c. Decomposers d. All of the above
- Stratified squamous epithelium assists the body by providing
a. Protection against invasion by microorganisms b. Anchors for our bones
c. Support for the body d. Contractility
- _____ is the sequence of base pairs in each gene of each chromosome that determines
a. Anaphase b. Translation c. Heredity d. Thymine
- The maintenance of a relatively constant internal environment despite fluctuations in the external environment is termed as
a. Homeostasis b. Endocytosis c. Pinocytocysis d. Selective permeability
- A state of metabolic depression and inactivity in animals, usually during winter
a. Hibernation b. Dormancy c. Rest d. Rigor mortis
- If members of different species compete for resources phenomena is called as
a. Interspecific Competition b. Competition c. Autotrophs d. Insectivorous
- Which of the following occurs in the Mitochondria?
a. glycolysis b. electron transport chain c. fermentation
d. all of the above

- 9) The phase of mitosis that takes the least amount of time is _____.
- a. Prophase b. Metaphase c. Anaphase d. Telophase
- 10) Which of the following enzymes plays a central role in the control of the cell cycle?
- a. hydrolase b. cdk kinase c. glucose 6-phosphatase d. acid phosphatase
- 11) Which of the following symbols would represent alleles of one another?
- a. vg and se b. vg and vg c. vg and vg+ d. se and dp
- 12) The parents in a monohybrid cross are all _____.
- a. heterozygous for genes at two loci. b. homozygous for genes at two loci.
c. heterozygous for genes at one locus. d. homozygous for genes at one locus
- 13) The discovery that genes occur on chromosomes was made by _____.
- a. Edward van Benden¹ b. Gregor Mendel c. Thomas Hunt Morgan d. Friedrich Schneider
- 14) The study of animal behavior that focuses on evolution and the natural environment is ____.
- a. comparative psychology b. ethology c. behavioral ecology d. sociobiology
- 15) A sudden accidental change in the frequency of alleles in a population is a definition of ____.
- a. natural selection b. genetic drift c. evolution d. gene flow
- 16) If the requirements of the Hardy-Weinberg theorem are all met, then ____.
- a. Evolution is occurring rapidly b. Evolution is occurring slowly
c. Evolution is not occurring d. Gene frequencies are changing
- 17) An adaptation is any characteristic of an organism that ____.
- a. Makes the organism stronger b. Makes the organism faster c. Makes the organism better able to reproduce in its particular environment. d. Both a and b are correct.
- 18) The study of the movement of crustal plates during continental drift is called ____.
- a. historical geology b. biogeography c. anthropology d. plate tectonics
- 19) The mitotic spindle disassembles during what phase of mitosis?
- a. Prophase b. Metaphase c. Anaphase d. Telophase
- 20) The microtubules of the mitotic spindle are attached to the ____.
- a. Kinetochore b. Centromere c. Centrosome d. All of the above

Q3. Fill in the blanks (1/2 X 20=10).

1) During protein synthesis, _____ is produced in the nucleus and carries the genetic code to the cytoplasm.
2) In the DNA molecule, the base adenine pairs with the base _____.
3) The combination of Darwinian evolutionary theory and population genetics is referred to as _____.
4) Blood is _____ type of tissue?
5) Membranes that separate cytoplasm and nucleus is called _____.
6) Engulfing of solid material by cell is called _____.
7) _____ is the storage site of food and other compounds in cells, it also pumps water out of a cell.
8) A chemical reaction which requires energy is called as _____ reactions.
9) _____ lowers the amount of energy required to initiate a chemical reaction.
10) Entropy is defined as _____.
11) The eukaryotic cell obtains a net gain of _____ ATP molecules from the breakdown of each glucose molecule.
12) AUG is the _____ codon.
13) A gene that hides the expression of its allele is _____.
14) The visual expression that results from the genetic makeup of an individual is called the _____.
15) The atomic weight of an element is the number of _____ in its nucleus.
16) _____ bond forms by the sharing of electrons?
17) A few animals like being shrimp and some flatworms have more than two sets of chromosomes. This condition is referred to as _____.
18) Distilled water has a pH of _____.
19) The key element in all organic molecules is _____.
20) An association of DNA and histone proteins is responsible for packaging DNA into chromosomes. This combination is called a(n) _____.



UNIVERSITY OF THE PUNJAB
B.A. / B.Sc. (Composite) Annual Exam – 2019

Roll No.

Subject: Zoology
PAPER: B

MAX. TIME: 2 Hrs.
MAX. MARKS: 20

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Q. NO. 4. Give brief answer to any TEN of the followings: 1x10=10

- i) What is Regeneration?
- ii) What class of fishes is characterized by some bone, operculum and usually lungs or swim bladder?
- iii) What animals are members of order Caudata?
- iv) Why is uric acid an adaptive excretory product of reptiles?
- v) What is Anapsid skull in living amniotes?
- vi) What characteristics of *Archaeopteryx* are reptile like?
- vii) Why is monogamy advantageous for most birds?
- viii) What are the two sub-classes of mammals?
- ix) What is Tagmatization?
- x) What are the functions of mantle cavity in molluscs?
- xi) What is a Spermatophore?
- xii) What is Typhlosole?
- xiii) Why are nematomorphs called Gordian worms?
- xiv) What is a Cocoon?
- xv) Define Parasitism.

Q. NO. 5.

- a) Describe the reproduction, regeneration and autotomy in sea stars. 5
- b) Classify the Phylum Arthropoda. 5

OR

- a) Describe blood circulation and gas exchange in Amphibians. 5
- b) Discuss respiratory system of a Bird. 5



UNIVERSITY OF THE PUNJAB
B.A. / B.Sc. (Composite) Annual Exam – 2019

Subject: Zoology
 PAPER: B

MAX. TIME: 1 Hr.
 MAX. MARKS: 30

Roll No. in Fig.

Roll No. in Words.

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. NO. 1. Tick (✓) the correct option from the MCQs given below: $\frac{1}{2} \times 20 = 10$

- i) The molluscs are most closely related to the _____.
 a. annelids and chordates b. echinoderms and chordates c. arthropods and chordates
 d. annelids and arthropods
- ii) Ticks and mites are members of the order _____.
 a. Opiliones b. Acarina c. Araneae d. Scorpionida
- iii) Which of the following characters can be used to distinguish Urochordata from all other chordates?
 a. Pharyngeal basket b. endostyle c. postanal tail d. buccal apparatus
- iv) The _____ allows an alligator to breathe when the mouth is full of water or food.
 a. secondary palate b. Jacobson's organs c. pit organs d. plastron
- v) A dental formula of 2.1.2.3/2.1.2.3 indicates that this mammal has ____ molars
 a. 0 b. 1 c. 2 d. 3
- vi) The type of symbiotic relationship where both species benefit is termed
 a. parasitism b. commensalism c. mutualism d. symbiosis
- vii) The most complex sponges have the _____ organization.
 a. Sycon b. leucon c. ascon d. mycon
- viii) Most turbellarians, such as the common planarian,
 a. are carnivores b. will also feed as herbivores c. have chemoreceptors that help them detect food
 d. all of the above (a-c)
- ix) There are _____ classes within the phylum Rotifera.
 a. 2 b. 3 c. 4 d. 5
- x) The mantle of most molluscs _____.
 a. is modified for locomotion b. is used in attracting prey c. secretes the shell
 d. supports the radula
- xi) Oligochaetes are _____.
 a. monoecious b. dioecious c. monoecious or dioecious d. asexual
- xii) Barnacles are members of the class _____.
 a. Malacostraca b. Branchipoda c. Copepoda d. Cirripedia
- xiii) A _____ is (are) a protective case(s) for the pupal stage of an insect that is formed from the last larval exoskeleton?
 a. Cocoon b. puparium and cocoon c. puparium and chrysalis
 d. chrysalis and cocoon
- xiv) Sea stars belong to the class _____.
 a. Echinoidea b. Asteroidea c. Holothuroidea d. Crinoidea
- xv) Tunicates or sea squirts are members of the chordate subphylum _____.
 a. Urochordata b. Cephalochordata c. Enteropneusta d. Plesiobranchia
- xvi) Most fishes excrete _____ as the primary nitrogenous byproduct of protein metabolism.
 a. Ammonia b. urea c. uric acid d. creatine
- xvii) All of the following are members of the amniote lineage EXCEPT one. Select the exception.
 a. amphibians b. reptiles c. birds d. mammals
- xviii) The closest living reptilian relatives of the dinosaurs are the _____.
 a. Testudines b. Crocodylia c. Rhynchocephalia d. Squamata
- xix) Feathers of a bird that have sensory functions are called _____ feathers
 a. Down b. filoplume c. contour d. dermal
- xx) A diaphragm is present in _____.
 a. birds and mammals b. reptiles, birds and mammals c. mammals only
 d. birds and reptiles

P.T.O.

Q. NO. 2. Fill in the Blanks:

1/2x20=10

- i) In the life cycle of Plasmodium, merozoites are formed in the _____
- ii) The class of Cnidaria that includes anemones is _____
- iii) The scientific name of the common liver fluke is _____
- iv) In gastropods, gas exchange always involves _____ cavity.
- v) The largest class of annelids is _____
- vi) Living arthropods are divided into _____ subphyla.
- vii) The respiratory pigment in crayfish is _____
- viii) _____ were the first animals to fly.
- ix) In sea stars, radial nerves coordinate the functions of _____
- x) Salamanders belong to the class _____
- xi) The common opening of digestive, excretory and reproductive products in fishes is _____
- xii) A bullfrog prey on small _____, birds and other animals.
- xiii) In crocodiles, the tail is used for _____, offensive and defensive maneuvers.
- xiv) Dorsal part of shell of tortoise is called _____
- xv) Feather barbs branch off the shaft, and _____ branch off the barbs.
- xvi) Claws are present in _____, reptiles, birds and mammals.
- xvii) Flight muscles have many _____ to provide energy for flight.
- xviii) Mammalian females have _____ or menstrual cycle.
- xix) Bones of most birds are _____ and delicate.
- xx) Hair colour depends on the amount of pigment _____ deposited in it.

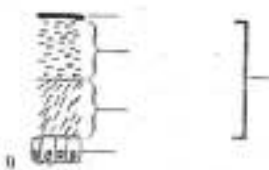
Q. NO. 3. a) To which animal / group, the following larvae belong: 1/2x5=2.5

Larvae	Animal / Group	Answer
i) Brachiolaria	Trematodes	_____
ii) Metacercaria	Hemichordates	_____
iii) Pflidium	Sponges	_____
iv) Trocha	Nematodes	_____
v) Amphiblastula	Asteroides	_____

b) Assign Order to the following animals: 1/2x5=2.5

- | | |
|--------------------|------------------|
| i) Chameleon _____ | ii) Dove _____ |
| iii) Newts _____ | iv) Shrews _____ |
| v) Rabbit _____ | |

c) Label the following diagrams as indicated: 2.5+2.5



i) _____
ii) _____



UNIVERSITY OF THE PUNJAB
B.A. / B.Sc. (Composite) Annual Exam – 2019

Roll No.

Subject: Zoology
PAPER: C

MAX. TIME: 2 Hrs.
MAX. MARKS: 20

ATTEMPT THIS (SUBJECTIVE) ON THE SEPARATE ANSWER SHEET PROVIDED

Part -II

Attempt any **THREE** questions of the Following:

- | | |
|---|---|
| Q. 4. Write a note on non-muscular movement | 4 |
| Q. 5. Discuss the Baroreceptors. | 4 |
| Q. 6. What are antigens and antibodies? Describe the antibody mediated immune response. | 4 |
| Q. 7. Write a note on Gastrointestinal Motility and its Control. | 4 |
| Q. 8. Write a note on Hormonal Regulation in gestation. | 4 |

Part -III

Attempt any **ONE** question:

- | | |
|---|---|
| Q.9 Define Stimulus. Give a comprehensive account of The Spinal Cord, Spinal Nerves | 8 |
| Q.10. Write a note on the HUMAN HEART structure along with the blood it deals with. | 8 |

(1/2)



UNIVERSITY OF THE PUNJAB
B.A. / B.Sc. (Composite) Annual Exam - 2019

Subject: Zoology
 PAPER: C

MAX. TIME: 1 Hr.
 MAX. MARKS: 25

Roll No. in Fig.

Roll No. in Words.

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.

- NOTE:
- 1) Cutting and overwriting is not allowed in objective part (Part-I).
 - 2) In part-I all questions are compulsory. Answer these questions on the questions sheet only.
 - 3) Answer any three questions from Part-II and one question from Part III on separate answer sheet provided.

IMPORTANT NOTE: Attempt Part-I in the given time of 1 hour and hand over to the Centre Superintendent. The Centre Superintendent will provide you Answer sheet for Part-II and Part-III.

Part - I

For Part-I Time Allowed: 1hr & Max. Marks: 25

Q. 1. Multiple choice questions (Tick mark the right answer)
 0.5×20=10

1. Statocysts, as found in various gastropods, cephalopods, and crustaceans, are a good example of a _____
 a. hygroreceptor
 b. georeceptor
 c. baroreceptor
 d. chemoreceptor
2. True phonoceptors that respond to sound have been demonstrated only in _____
 a. insects, arachnids, and centipedes
 b. protozoa, hydra, and molluscs
 c. molluscs, tunicates, and arthropods
 d. vertebrates
3. Certain flagellated protozoa (e.g., Euglena) contain bright red photoreceptor granules called the _____
 a. ocellus
 b. compound eye
 c. stigma
 d. ommatidium
4. True hormones were first identified in _____
 a. cnidarians
 b. Platyhelminthes
 c. nematodes
 d. molluscs
5. Which of the following is not produced by the anterior lobe of the pituitary gland?
 a. STH
 b. ACTH
 c. FSH
 d. MSH
6. The transport system found in protozoa that moves gases is
 a. simple diffusion.
 b. a gastrovascular cavity.
 c. hemolymph
 d. an open circulatory system.
7. Coelomic fluid is used to transport gases in
 a. rotifers
 b. gastrotrichs
 c. nematodes
 d. all of the above
8. The annelids, such as the earthworm, have an _____ circulatory system
 a. closed
 b. open
 c. coelomic
 d. hemolymph
9. A vertebrate, such as yourself, can extract approximately _____ calories per gram of carbohydrate.
 a. 2
 b. 4
 c. 6
 d. 8
10. In animals, which of the following would be categorized as a trace mineral?
 a. copper
 b. calcium
 c. chlorine
 d. sodium
11. Which of the following is not a fat soluble vitamin?
 a. A
 b. B12
 c. D
 d. K
12. _____ is the loss of heat from a surface as water molecules escape in the form of a gas.
 a. Conduction
 b. Convection
 c. Evaporation
 d. Radiation
13. Animals cope with temperature fluctuations by
 a. occupying a place in the environment where the temperature remains constant and compatible with their physiological processes.
 b. adapting their physiological processes to the range of temperatures in which the animals are capable of living.
 c. Generating heat and trapping heat internally to maintain a constant body temperature despite fluctuations in the external environment temperature.
 d. all of the above
14. In general, reptiles, fishes, and amphibians are _____
 a. endotherms
 b. ectotherms
 c. homeotherms
 d. all of the above

15. At night, hummingbirds enter a sleep like state called _____
 a. estivation
 b. hibernation
 c. daily torpor
 d. sleep deprivation
16. Water, fructose, vitamin C, and prostaglandins are secreted by the _____ in mammals.
 a. prostate gland
 b. seminal vesicles
 c. bulbourethral glands
 d. all of the above
17. Which of the following hormones aids sperm maturation and increases testosterone production?
 a. GnRH
 b. LH
 c. FSH
 d. TSH
18. In a female mammal, which of the following hormones induce the mammary glands to secrete and eject milk after birth?
 a. prolactin
 b. oxytocin
 c. hCG
 d. both a and b
19. The study of animal development from the fertilized egg to the formation of all major organ systems refers to which field of science?
 a. Embryology
 b. Cytology
 c. Molecular biology
 d. histology
20. Yolk, the food reserve for the developing embryo contains
 a. Proteins
 b. Lipids
 c. Glycogen
 d. All of above

Q. 2. Write the precise answer in the blanks provided

0.5×20=10

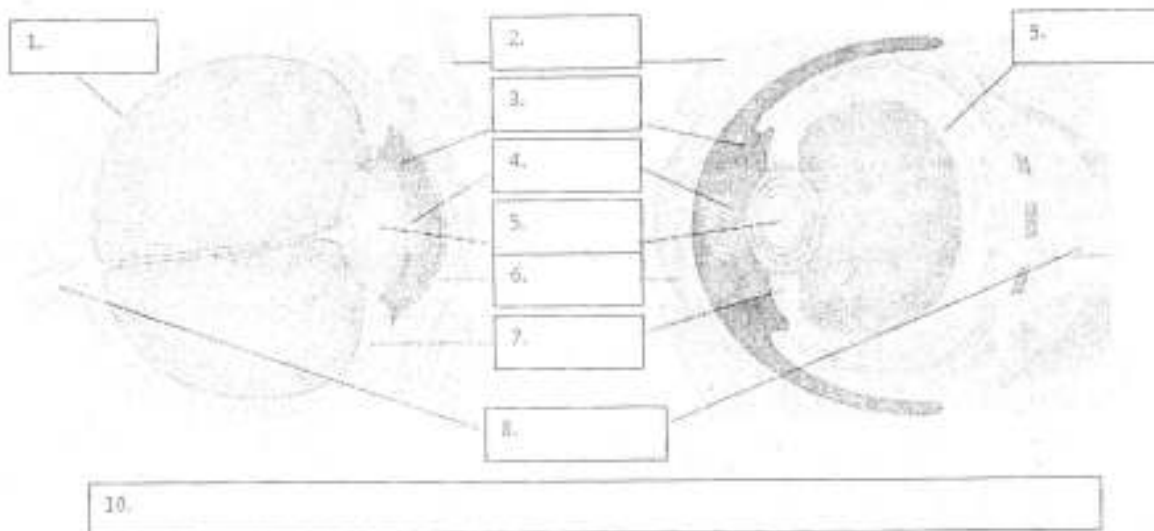
- _____ is the straw-colored, liquid part of blood. In mammals, plasma is about 90% water and provides the solvent for dissolving and transporting nutrients.
- All WBCs are derived from immature cells (called stem cells) in bone marrow by a process called _____.
- The most sophisticated feeding strategies, that requires the capture of live prey refers to _____.
- Gallbladder stores the greenish fluid called _____ that the liver cells continuously produce.
- If the osmotic concentration of the body fluids of an animal equals that of the environment, the animal is an _____.
- The urine concentration of the fresh water fishes is _____ relative to blood.
- _____ is the movement of air (or a liquid) over the surface of a body; it contributes to heat loss if the air is cooler than the body or heat gain if the air is warmer than the body.
- In human male reproductive system the paired _____ secrete water, fructose, prostaglandins, and vitamin C.
- _____ stimulates thickening of uterine wall, maturation of oocyte and development of female sexual characteristics; inhibits FSH secretion; increases LH secretion.
- The animals that derive most of their body heat from the environment rather than from their own metabolism are termed as _____.
- The endoskeletons of sponges consist of _____.
- The _____ is the thickened region of gray matter that integrates visual and auditory signals.
- The _____ system for electrical sensing is in the head area of most fishes, some amphibians, and the platypus.

(F)

14. Invertebrate and vertebrate sensory receptors (organs) have evolved in ways that relate to the _____ in which they must function.
15. A stimulus is any form of energy an animal can detect with its _____.
16. Early cleavages in the zygote of a bird result in the formation of the _____.
17. The development of an anus and complete digestive tract first occurred in the _____.
18. A _____ is a specialized chemical messenger that an endocrine gland or tissue produces and secretes.
19. The central nervous system is composed of brain and _____.
20. Hygroreceptors detect the _____ of air.

Q. 3. Identify the diagram and label its indicated parts

0.5 × 10 = 5



(S)