

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. SECOND SEMESTER EXAMINATION, MAY 2019

FIRST YEAR [BATCH 2018-21]

ZOOLOGY (Honours)

Paper : II

Date : 16/05/2019

Time : 11 am – 3 pm

Full Marks : 100

[Use a separate Answer Book for each Group]

Group - A

1. Answer **any three** questions : [3×5]
 - a) "Distribution and quantity of yolk in egg determines the mode of cleavage in an organism"—Explain. What is diffused placenta? [4+1]
 - b) What are polar bodies? Mention their significance. What is optic cup? What is Spemann organizer? [1+1+1+2]
 - c) What are proximal & distal centrioles? Mention their significance. Name two vital dyes. What is polyphenism? [2.5+1+1.5]
 - d) What is ovarian hyper stimulation syndrome? Briefly describe the effect of bisphenol A as a teratogen. [1+4]
 - e) Write a short note on morphallactic regeneration in *Hydra*. [5]
2. Answer **any two** questions : [2×10]
 - a) Define Niche and potency of a stem cell. Distinguish between embryonic stem cell and adult stem cell. Give an account of embryonic stem cell therapeutics. What are terminally differentiated cells. Give example. [2+2+4+(1+1)]
 - b) What is Nieuwkoop center? Enumerate the significance of capacitation? What is Chorion frondosum? Define cortical rotation. Compare between primary and secondary neurulation. What are protamines? [2+2+1+2+2+1]
 - c) What is morphogenetic movement? Discuss morphogenetic movements through a primitive streak. Describe how an ovum prevents polyspermy by establishing the fertilization membrane? [2+4+4]
 - d) Define Metamorphosis. Describe the hormonal regulation in premetamorphosis, postmetamorphosis and metamorphic climax in amphibians. [1+3+3+3]
3. Answer **any four** questions: [4×10]
 - i) "The transformation of a motile *Ascidia* larva to a sessile adult is also advantageous from the standpoint of evolution"— justify. Distinguish between 'Schizocoelom' and 'Enterocoelom'. What are 'Annulus fibrosus' and 'Nucleus pulposus'? "Hemichordates are not true chordates"— justify with reasons. [3+2+2+3]
 - ii) Which parts of the body, other than gills, are used by *Boleophthalmus* for respiration? What is a hydrodynamic noise? Describe how it is identified by neuromasts of a limnophilic fish. Which parts of the vertebra of a snake do facilitate it moving in a zigzag way? How do the 'Annuli' of a worm lizard differ from the 'Annuli' of an earthworm? Mention three major characteristic features of the order 'Galliformes'. [1+(1+3)+1+2+2]

- iii) Explain how the diffusion of gases takes place from blood flow to swim bladder in the body of a fish. 'The skull of a crocodile is distinctive compared to other reptiles' – justify. In which order does the 'Tasmanian Devil' belong? State its major characteristic features. [4+3+(1+2)]
- iv) Differentiate between Artiodactyla and Perissodactyla. Describe the basic pattern of aortic arches in vertebrates with a diagram. Comment on evolutionary significance of aortic arches. [3+(3+2)+2]
- v) Describe the biting apparatus of venomous snake. Explain the biting mechanism of solenoglyphous snake with suitable diagram. How ASVS is produced in India? [3+5+2]
- vi) Briefly discuss the structure of mammalian hair. What is prong-horn? Write a note on development of feather in bird. [4+2+4]
- vii) Compare primary and secondary gill bars of *Branchiostoma*. What are the role of oral cirri and wheel organ in the filter feeding of *Branchiostoma*? Write down the development of mammalian hair. [3+3+4]
- viii) Describe the mechanism of rumination. Write a note on symbiotic micro-organisms of rumen. Explain echolocation jamming and its solution. [4+3+3]

Group - B

4. Answer **any five** questions : [5×5]
- i) Define complete linkage with a suitable genetic cross. [1+4]
 - ii) What is Robertsonian translocation? Differentiate between pericentric and paracentric inversion. [2.5+2.5]
 - iii) $++z \quad 367, v w + \quad 338, + w + \quad 88, V + z \quad 96, V + + \quad 61, + w z \quad 46, v w z \quad 1$
 $+++ \quad 3$
 Draw a map of these 3 genes (v, w, and z) showing the distances between all pairs of genes, and then calculate the value of interference. [5]
 - iv) How do you detect lethal mutation in the X chromosome of *Drosophila* with a suitable method? What is 'target hypothesis'? [2+3]
 - v) Briefly discuss about the steps of mismatch repair system. What are base analogs? provide examples. [3+1+1]
 - vi) Explain primary and secondary sex determination in human. [2.5+2.5]
 - vii) What is MSL complex? Write down its significance in *Drosophila* dosage compensation. What is 'Lyon Hypothesis'? [4+1]
 - viii) What do you mean by 'Hardy-Weinberg equilibrium'? Albinism is the phenotypic expression of a homozygous recessive genotype. One source estimates the frequency of albinos as in 1/18,000. What percentage of population is heterozygous for this gene? Define Mutational equilibrium. [1+3+1]

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