

**2020**  
**ZOOLOGY**  
**M.Sc. Fourth Semester Examination**  
**ZCT 434**  
**(Comparative Animal Physiology)**  
**Full Marks 40**

*Answer any four of the following questions*

1. Delineate with examples, the mechanistic and evolutionary interpretations of animal physiology. Write a note on the integrative approach of research in animal physiology.  
6+4 =10
  2. Write with examples, the physiology of endothermy and thermoregulation. Schematically present the categories of organism in relation to exhibition of endothermy and / or thermoregulation. Cite examples of each category.  
5+5=10
  3. Compare and contrast the mechanisms of filtration and secretion of a primary fluid in the osmoregulatory organs like kidney and Malpighian tubule. How does the composition of primary fluid differ in two mechanisms? Present the experimental basis of preference of secretion over filtration and comment on its evolutionary significance.  
4+3+3 =10
  4. (a) 'Varieties of vertebrate RBCs are linked with the transitional forms with every possible gradations'- discuss.  
(b) State the morphofunctional characteristics of the commonest WBC of bird.  
(c) How do the capillary caliber and RBC diameter help fish to combat cold temperature?  
5+3+2 = 10
  5. (a) Is there any relationship between influenza severity and surface area to volume ratio?  
(b) "The total heat loss is greater in a bison than that in a prairie dog, but heat loss/ gram is much higher in a prairie dog" –explain.  
(c) State the functional influence of surface area, volume and mass on the quantitative absorption of essential molecules across cell membrane.  
3+3+4 = 10
  6. (a) How does bacterial peptidoglycan activate Toll pathway of inducible humoral response in insect?  
(b) "Plasmatocyte of *Drosophila* is not equivalent to that of a lepidopteran insect"- discuss.  
5+5 = 10
  7. Explain with diagram, the different routes of heat energy exchange between an animal and environment. What is thermal hysteresis? Define cold block.  
5+3+2 = 10
  8. (a) Define isometry and allometry with examples and sketches.  
(b) How is the set point of glucose maintained in human blood after a heavy meal?  
(c) Distinguish between metabolic acidosis and alkalosis.  
4+3+3 = 10
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