

Total pages: 2

**PG CBCS**  
**M.Sc. Semester-I Examination, 2020**  
**ZOOLOGY**  
**PAPER: ZOO 102**

**Full Marks: 40****Time: 2 Hours**

*The figures in the right-hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable.*

**Group-102.1**  
**(Marks: 20)**  
**(Histochemistry)**

**1. Answer two questions of the following: **10x2=20****

- a. What is a fixative? Write the properties of an ideal fixative. Why fixation is done? Write names of two special fixatives and their use. 2+2+2+4
- b. What is a micro technique? Write commonly used methods for micro techniques. Discuss the general steps of affixing paraffin sections. What are the steps for processing the tissue sample for paraffin sectioning? 2+2+3+3
- c. What is stain? Name two most commonly used aniline dyes stains used for bacteria. What is the structural component (nature) of stains? What is the mechanism that causes staining on a tissue? 2+2+2+4
- d. Write the conditions for the histochemical demonstration of enzymes. What is the principle of reactions in histochemical Methods for the detection of enzymes? In what way you can correlate between histochemical and biochemical Findings? 3+4+3
- e. What does immunohistochemistry measure? Write the basic procedure for immunohistochemistry tissue preparation. Why is Immunohistochemistry used? What way immunofluorescence will apply for immunohistochemical detection? 2+4+2+2

**Group-102.2**  
**(Marks: 20)**  
**(Animal physiology)**

**2. Answer two questions of the following: **10x2=20****

- a. i Distinguish between R and T forms of haemoglobin.
- ii. State the source, chemical nature and mode of action of mammalian erythropoie
- iii. Describe the haemodynamics behind the origin of laminar and turbulent types of blood flow, with reference to Reynold's number. 2+4+4

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- b. i. Precisely comment on the role of baroreceptor in regulation of hypertension.
- ii. What are the similarities and dissimilarities between myoglobin and haemoglobin? What is the function of myoglobin?
- iii. Why do sea-divers suffer from nitrogen narcosis and oxygen toxicity? What measure is taken to prevent these physiological hazards? 2+4+4
- c. i. State the respective reason behind the production of the first and the second heart sounds.
- ii. What do you mean by natural and ectopic pacemakers of mammalian heart?
- iii. Mention the salient characteristics of different components of a normal ECG. 2+4+4
- d. i. Which of the ROS do you consider to be the most toxic for cells? Mention a way by which it is generated in cells?
- ii. Briefly discuss the role of ROS in ageing of cells and whole organisms.
- iii. Add a note on the antioxidant activity of (i) glutathione peroxidase and (ii) vitamin E. 2+4+4
- e. i. Mention the mechanism and significance of pilo-erection in cold weather.
- ii. Characterise brown adipose tissue (BAT). Explain the role of BAT in thermogenesis in hibernator mammals.
- iii. What is a counter-current heat-exchanger (CCHE)? Describe the role of CCHE in thermoregulation in the Arctic dolphin. 2+4+4

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