(6 pages)

Reg. No. :

Code No.: 5909 Sub. Code: PZOM 34

M.Sc. (CBCS) DEGREE EXAMINATION, NOVEMBER 2020.

Third Semester

Zoology — Core

RESEARCH METHODOLOGY — I

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — $(10 \times 1 = 10 \text{ marks})$

Answer ALL questions.

Choose the correct answer :

- 1. Scanning electron microscopy is most often used to reveal ————.
 - (a) Surface structures
 - (b) Internal structures
 - (c) Both surface and internal structures simultaneously
 - (d) Either surface or internal structures, but not simultaneously

- 2. The instrument that produces a bright image of the specimen against a dark background is called a(n) ——— microscope.
 - (a) Phase-contrast
 - (b) Transmission electron
 - (c) Bright-field
 - (d) Dark-field
- 3. Which of the microscopes below is usually good for use on unstained specimens?
 - (a) Phase-contrast (b) Fluorescence
 - (c) Bright-field (d) Scanning electron
- 4. Which of the following is an effective way of purifying liquids containing suspensions?
 - (a) Crystallization (b) Decanting
 - (c) Centrifuge (d) Separating funnel
- 5. How does centrifugation work?
 - (a) Through dripping particles
 - (b) Through spinning
 - (c) By keeping large particle in the center and smaller on the outside
 - (d) By separating particles into different tubes

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- 6. A characteristic feature of any form of chromatography is the
 - (a) Use of molecules that are soluble in water
 - (b) Use of an inert carrier gas
 - (c) Use of a mobile and a stationary phase
- 7. In column chromatography, the stationary phase is made of ———— and the mobile phase is made of ————
 - (a) Solid, liquid (b) Liquid, liquid
 - (c) Liquid, gas (d) Solid, gas
- 8. Western blotting is the technique for the detection of
 - (a) Specific DNA in a sample
 - (b) Specific RNA in a sample
 - (c) Specific protein in a sample
 - (d) Specific glycolipid in a sample

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- 9. A blank contains the ——— but not the dissolved chemical.
 - (a) Solvent
 - (b) Solute
 - (c) Filter
 - (d) Absorption spectrum
- 10. Using a standard curve, if you know the absorbance of an unknown sample, what else can be determined about the unknown?
 - (a) The wavelength of maximum absorbance
 - (b) The molecular weight of the sample
 - (c) The concentration of the sample
 - (d) The identity of the sample

PART B — $(5 \times 5 = 25 \text{ marks})$

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) What is research? Comment on the objectives of research.

Or

- (b) Define patent and list out its applications in Biology.
- 12. (a) Give a short note on principle and applications of light microscopy.

Or

(b) Describe the micrometry technique and its limitations.

Page 4 Code No. : 5909 [P.T.O.] 13. (a) List out the applications of centrifugation in Biology.

Or

- (b) What is Cryopreservation? How it can be used to preserve biological samples?
- 14. (a) What is a Reverse Phase Chromatography and list out its advantages compared to normal phase?

Or

- (b) Write a brief account on Gas Chromatography.
- 15. (a) Define electromagnetic spectrum and list out its properties.

Or

(b) List out the applications of Absorption Spectroscopy.

PART C — $(5 \times 8 = 40 \text{ marks})$

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 600 words.

16. (a) Write in detail about the characteristics and types of research.

Or

(b) Discuss in detail about the various components of intellectual property rights.

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17. (a) Write an essay on types of light microscopy and their applications.

Or

- (b) Write a principle, instrumentation and applications of scanning electron microscopy.
- 18. (a) Give a detailed account on different types of centrifuges.

Or

- (b) Draw a block diagram of colorimeter and discuss its applications in biology.
- 19. (a) Write an essay on principle, methodology and applications of affinity chromatography.

 \mathbf{Or}

- (b) What is an 'Electrophoresis'? How will you separate proteins using SDS-PAGE?
- 20. (a) Write an essay on principle and applications of NMR spectroscopy in biology.

Or

(b) Discuss in detail about principle and applications of ESR spectroscopy.

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