

Total Pages : 3

Roll No. -----

MCH-504

Spectroscopy/Computer/Biology & Mathematics-1

M.Sc. Chemistry (MSCCH-20)

1st Semester Examination June 2022

Time: 2 Hours

Max. Marks: 40

Note : This paper is of Forty (40) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

Section – A

(Long Answer – type questions)

Note: Section 'A' contains Five (05) long-answer-type questions of Ten (10) marks each. Learners are required to answer any two (02) questions only.

[2 x 10 = 20]

Q.1. (a) Calculate the distance between two points P(x_1, y_1) and Q (x_2, y_2).

(b) Find the slope of a straight line passing through the point (1, -2) and (-2, 3).

Q.2. Find the derivatives of $f(x) = e^x(x^2 + 1)$.

P.T.O.

- Q.3. Differentiate the ideal equation $PV = nRT$ with respect to T.
- Q.4. (a) Describe the structure of a typical eukaryotic cell.
(b) Differentiate Prokaryotic and eukaryotic cell.
- Q.5. How are carbohydrate classified? Give an account of the structure and function of Polysaccharides.

Section – B

(Short-answer-type questions)

Note: Section 'B' contains Eight (08) short-answer-type questions of Five (05) marks each. Learners are required to answer any Four (04) questions only.

[4 x 5 = 20]

- Q.1. Discuss the classification of lipids with suitable examples.
- Q.2. Explain the structure and function of cholesterol.
- Q.3. Write notes on acid hydrolysis of proteins.
- Q.4. What are the different types of RNA molecules?
- Q.5. Find the second order of derivative of $e^x \sin x \cos 2x$.

P.T.O.

Q.6. Find the determinant of the matrix:

$$\begin{bmatrix} 11 & 12 \\ -4 & 6 \end{bmatrix}$$

Q.7. Find:

$$\int (x^3 - 2x^2 + 3)dx$$

Q.8. Solve $xy^2 dy - (x^3 + y^3) dx = 0$
