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Roll No.

MCH-504

Spectroscopy/Computers/Biology & Mathematics-I

M.Sc. Chemistry (MSCCH)

1st Semester Examination, 2023 (June)

Time : 2 Hours]

[Max. Marks : 35

Note : This paper is of Thirty Five (35) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answer to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION-A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nine and Half ($9\frac{1}{2}$) marks each. Learners are required to answer any Two (02) questions only.

($2 \times 9\frac{1}{2} = 19$)

1. (a) Find the distance of the point P (2, 3) from the x -axis.
(b) Find the distance between the point A (1, 2) and B (4, 2).

$$2. \quad \text{If } \begin{bmatrix} x+3 & z+4 & 2y-7 \\ -6 & a-1 & 0 \\ b-3 & -21 & 0 \end{bmatrix} = \begin{bmatrix} 0 & 6 & 3y-2 \\ -6 & -3 & 2c+2 \\ 2b+4 & -21 & 0 \end{bmatrix}$$

Find the value of a , b , c , x , y and z .

3. Differentiate the following Equations with respect to x :

(a) $5x^3 + 2x^2 + 1$.

(b) $x^{3/2} + 5x + 4$.

4. Write Short Notes on ;

(ai) Reducing and non-reducing sugars.

(b) Oligosaccharides.

5. What are amino acids? Explain essential and non-essential amino acids.

SECTION-B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Four (04) marks each. Learners are required to answer any Four (04) questions only. $(4 \times 4 = 16)$

1. Find the following integration :

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

2. Evaluate the following integral :

$$\int_2^3 x^2 \cdot dx.$$

3. Find dy/dx of $2x + 3y = \sin x$.

4. Find the slope of line passing through the points (3, -2) and (-1, 4).

5. Explain what is meant by (i) a peptide linkage (ii) a glycosidic linkage.

6. State clearly what are known as nucleosides and nucleotides.

7. What are the structure and function of the cell?

8. What are nitrogen derivatives of fatty acids? Give their synthetic applications.
