

S-446

Total Pages : 3

Roll No.

MCH-504

Spectroscopy/Computers/Biology & Mathematics-I

M.Sc. Chemistry (MSCCH)

1st Semester Examination, 2022 (Dec.)

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.

SECTION-A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Nine and Half (9½) marks each. Learners are required to answer any Two (02) questions only.

(2×9½=19)

1. Find order and degree of

(a) $\frac{dy}{dx} - \cos x = 0.$

(b) $xy \frac{d^2y}{dx^2} + x \left(\frac{dy}{dx} \right)^2 - y \frac{dy}{dx} = 0.$

2. If $A = \begin{bmatrix} 1 & -2 & 3 \\ -4 & 2 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 3 \\ 4 & 5 \\ 2 & 1 \end{bmatrix}$, then find AB, BA.

Show the $AB \neq BA$.

3. Evaluate the following integral :

$$\int_1^3 x^3 \cdot dx$$

4. (a) Describe the structure of a typical eukaryotic cell.
(b) Differentiate Prokaryotic and Eukaryotic cell.
5. How are nucleic acid classified? Give an account of the structure and function of DNA and RNA.

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. (4×4=16)

1. Find the general solution of differential equation

$$\frac{dy}{dx} = \frac{x+1}{2-y} \quad (y \neq 2).$$

2. Find the derivative of $\tan(2x + 3)$ dx .
 3. Find the integral of $\int \frac{x^3 - 1}{x^2} dx$.
 4. What is null matrix? Write down an example of null matrix.
 5. What are the different types of RNA molecule.
 6. What do you understand by the term glycosidic linkage.
 7. Explain Essential and non-essential amino acids.
 8. Define the following as related to proteins :
 - (a) Peptide linkage.
 - (b) Primary structure.
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