

Roll No.

21265

**B. Sc. (Hons.) Chemistry 2nd Semester
Examination – May, 2019**

MATHEMATICS - II

Paper : CH(H) 2050 Opt-ii

Time : Three Hours] [Maximum Marks : 40

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *one* question from each Section I-IV.

Question No. 9 from Section-V is *compulsory*.

SECTION – I

1. (a) Solve the simultaneous equations by elimination method. 4

$$4y + 3x = 100$$

$$4y - 19x = 12$$

P. T. O.

- (b) Check either the given pair of linear equation is constant or not. 4

$$2x + 3y = 9$$

$$4x + 6y = 18$$

2. Solve the system with three variables by Cramer's Rule. 8

$$x + 2y + 3z = -5$$

$$3x + y - 3z = 4$$

$$-3x + 4y + 7z = -7$$

SECTION - II

3. What is Group and check $(Q, *)$ is group or not, where Q is the set of Rational Number? 8

4. Define cyclic group. Prove $z_2 = \{0, 1\}$ under addition modulo 2 is cyclic group. 8

SECTION - III

5. (a) What are the different forms of the equation of a line? Explain with example. 4

- (b) What are Cartesian co-ordinates? Find the distance between $(2, -5, 7)$ and $(3, 4, 5)$. 4

6. Define equation of Ellipse in co-ordinate system. Find the Area of ellipse with $a = 2, b = 3$. 8

(2)

SECTION - IV

7. (a) Define Divergence of vector function, Divergence of $F = (-y, xy, z)$.

- (b) Find Cural of $F = (-y, xy, z)$.

8. (a) Find vector triple product of Given three vecti

$$\vec{a} = 2\hat{i} - \hat{j} + 3\hat{k}$$

$$\vec{b} = 3\hat{i} + 2\hat{j} + \hat{k}$$

$$\vec{c} = \hat{i} + 2\hat{j} + 4\hat{k}$$

- (b) Verify $\text{div}(\text{curl } \vec{F}) = 0$ for $\vec{F} = yz^2\hat{i} + xy\hat{j} + yz\hat{k}$

SECTION - V

9. (i) What is Cramer's Rule?

- (ii) What is Normal subgroup?

- (iii) What is Lagrange's theorem?

- (iv) Find distance between $A(2, 4)$ and $B(4, 6)$.

- (v) What is Laplacian operator?

- (vi) Find dot product of two vector $\vec{A} = 2\hat{i} + 4\hat{j}, \vec{B} = 3\hat{i} + 5\hat{j}$.

(3)