

END SEMESTER EXAMINATION, JUNE - 2019**BCA SECOND SEMESTER****COURSE CODE: BCA112****COURSE TITLE: FOUNDATION COURSE IN MATHEMATICS - II****[Time allotted: Three hours]****[Max. Marks: 100]***Note: Attempt all Sections & Questions.***Section (A)****Q.1. Attempt all questions.****(2 x 10 = 20)**

- a. What is the condition for two complex number $z_1 = (r_1, \theta_1)$ and $z_2 = (r_2, \theta_2)$ to be equal?
- b. What is the complex conjugate of the complex number $z = 5 + 3i$?
- c. Find the principal argument of the complex number $z = -1 - i$.
- d. Find the distance between (5, -2, 1) and (-1, -3, -2).
- e. If a differential equation is of order n then how many solutions it will have?
- f. What is the equation of the plane in normal form?
- g. Find the median of the numbers 7, 9, 16, 10, 18, 12, 13, 14, 15.
- h. What are the direction cosines of the Y-Axis?
- i. Find the solution of differential equation $(D^2 - 3D + 2)y = 0$.
- j. Coefficient of correlation lies between -2 and 1. (True/ False)

Section (B)**Q.2. Attempt any 5 questions.****(7 x 5 = 35)**

- a. Find the mode of the following data

Numbers	0-6	6-12	12-18	18-24	24-30	30-36	36-42
Frequency	6	11	25	35	18	12	6

- b. A die is thrown 8 times and it is required to find the probability that 3 will show (i) exactly 2 times (ii) at least seven times (iii) at least once.
- c. Find the ratio in which the line joining the points (4, 4, -10) and (-2, 2, 4) is divided by YZ- plane
- d. Find the radius and the coordinates of center of the following sphere $2x^2 + 2y^2 + 2z^2 - 4x + 8y + 10z + \frac{9}{2} = 0$.
- e. Find the symmetrical form of the equations of line $x - 2y + 3z = 4$, $2x - 3y + 4z = 5$.
- f. Solve the differential equation: $\frac{dy}{dx} + 2y \tan x = \sin x$.
- g. Solve the differential equation by : $(D^3 + 8)y = x^4 + 2x + 1$.

Section (C)

Attempt any 3 questions.

(15 x 3 = 45)

- Q.3. a. Find the median of the following data

(9)

Class interval	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	2	18	30	45	35	20	6	3

- b. In a certain factory producing cycle tyres, there is a small chance of 1 in 50 tyres to be defective. The tyres are supplied in lots of 10. Using Poisson distribution, calculate the approximate number of lots containing (i) no defects; (ii) at most 2 defects

(6)

- Q.4. a. Find all the three roots of $(-16i)^{1/4}$.

(9)

- b. Solve the differential equation $\frac{d^2 y}{dx^2} - 4 \frac{dy}{dx} + 4y = x^3 e^{2x}$.

(6)

- Q.5. a. Check whether the given points (-6, 3, -2), (3, -2, 4) and (5, 7, 3) and (-13, 17, -1) are coplanar.

(8)

- b. Find the solution of the differential equation $\frac{dy}{dx} = \frac{x+2y-3}{2x+y-3}$.

(7)

- Q.6. a. Find the equation of a sphere passing through the four points (0, 0, 0), (0, 1, -1), (-1, 2, 0) and (1, 2, 3).

(8)

- b. Solve the differential equation:

(7)

$$(2x \log x - xy) dy + (2y) dx = 0.$$

- Q.7. a. Find the coefficient of correlation between x and y from the following data

(9)

x	11	12	13	14	15	16	17	18	19	20
y	30	29	29	25	24	24	24	21	18	15

- b. Solve the following differential equation

(6)

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