Unit-V

5. (a) If the arithmetic mean of the data given below is 28, find the missing frequency :

Profit per retail shop in ₹ x	Number of retail shops f
0 – 10	12
10 – 20	18
20 – 30	27
30 – 40	–
40 – 50	17
50 – 60	6

(b) Find the median wage for the following data :

Wages x	Number of workers f
20 – 30	25
30 – 40	12
40 – 50	15
50 – 60	13
60 – 70	5

(c) Find the variance and standard deviation for the following data :

57, 64, 43, 67, 49, 59, 44, 47, 61, 59

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I/104—22 Roll No. .....

Annual Examination, 2022

B.C.A. Part I

BRIDGE COURSE FOR BCA

(Only for Non-mathematics Students)

Time : 3 Hours] [Max. Marks : 50

Note : *Attempt any two parts from each unit. All questions carry equal marks.*

Unit-I

1. (a) Resolve into Partial fractions :

$$\frac{x+8}{x^2+x-2}$$

(b) Prove that : $\begin{vmatrix} b+c & a & a \\ b & c+a & b \\ c & c & a+b \end{vmatrix} = 4abc$

(c) An arithmetic progression has 3 as its first term. Also the sum of the first 8 terms is twice the sum of the first 5 terms. Find the common difference.

Unit-II

2. (a) Find the number of integers greater then 7000, that can be formed with the digits 3, 5, 7, 8 and 9, where no digits are repeated.

(b) Apply the method of induction to show that:

$$\frac{1}{3.5}+\frac{1}{5.7}+\frac{1}{7.9}+\ldots+\frac{1}{(2n+1)(2n+3)} = \frac{n}{3(2n+3)}$$

(c) Find the coefficient of x^{11} in the expansion of $\left(x^3-\frac{2}{x^2}\right)^{12}$.

Unit-III

3. (a) Prove that : $\frac{\sec 8\theta - 1}{\sec 4\theta - 1} = \frac{\tan 8\theta}{\tan 2\theta}$

(b) Find the value of :

$$\left(1+\cos\frac{\pi}{8}\right)\left(1+\cos\frac{3\pi}{8}\right)\left(1+\cos\frac{5\pi}{8}\right)\left(1+\cos\frac{7\pi}{8}\right)$$

(c) From a point on the ground, the angles of elevation of the bottom and the top of a transmission tower, fixed at the top of a 20m high building are 45° and 60° respectively. Find the height of the tower.

Unit-IV

4. (a) Find the slop of a line, which passes through the origin, and the mid-point of the line segment joining the points P (0, – 4) and Q (8, 0).

(b) Find the acute angle between the pair of the line represented by the following equation :

$$y^2 - xy - 6x^2 = 0$$

(c) Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the latus rectum of the ellipse $36x^2 + 4y^2 = 144$.