NOTE : 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Simple calculators are allowed.
4) Graph papers will be provided on request.

Q. 1 **Explain the terms :** (15)

i) Correlation and the types of correlation.

ii) Dispersion and measures of dispersion.

iii) Statistics and its importance in various fields.

Q.2 A) **Find mean, median and mode for the following data :** (5)

Class	**10-30**	**30-50**	**50-70**	**70-90**	**90-110**	**110-130**
Frequency	4	10	14	12	8	6

B) **If the letters of the word "THURSDAY" be arranged at random, What is the probability that the arrangement.** (5)

i) begins with 'T'

ii) begins with 'T' and ends with 'U'.

C) Show that the points (1,-1), (-9, 6), (-2,14), and (6,7) are the vertices of a rectangle. (5)

Q.3A) **Draw Histogram and frequency curve on graph paper for the following Distribution.** (4)

Daily wages in Rs.	40-50	50-60	60-70	70-80	80-90	90-100	100-110	110-120
No. Of Workers	12	20	40	50	34	16	12	8

B) The mean and standard deviation of a group of 25 observations were 42 and 8 respectively. Two values were wrongly recorded as 25 and 20. Find the corrected mean and standard derivation after deleting wrong Value. (5)

C) The distribution of marks in Advertising (x) and marks in Business Planning (y) for a group of 10 students is given below. Calculate Karl, Pearson's coefficient of correlation. (6)

X	**25**	**20**	**17**	**16**	**20**	**14**	**23**	**21**	**15**	**12**
Y	24	17	22	18	20	18	24	20	16	14

P.T.O.

Q.3A) A red card is drawn at random from a well-shuffled pack of cards. What is the probability that the cards drawn is. (4)

i) a spade.

ii) Ace of spades

iii) A spade or A heart

iv) A picture card

B) For the following probability distribution, Obtain (7)

i) $P(x > 2)$

ii) $P(x \leq 1)$

iii) $P(x = 2 \text{ or } x = 3)$

iv) $E(x)$

v) $V(x)$

X	**-2**	**-1**	**0**	**1**	**2**	**3**
P(X)	0.1	0.2	0.2	0.3	0.15	0.05

C) A salesman is offered a salary of Rs. 2000 per month. In addition to this, he receives a commission at the rate of 4% on the sales which are in excess Of Rs. 40,000. If in a month, he receives a remuneration of Rs. 6,800. Find his total sale in that month. (4)

Q.4 A) A Newspaper dealer buys newspapers for Rs. 2 each and sells them at Rs. 3 each. Any papers not sold at the end of the day are completely worthless. The dealer has kept a record of his sales for the past 100 days Which is given below. Find the number of copies he should stock so that the expected profit is maximum. (8)

Daily Sale	300	400	500	600	700
No. Of days	15	20	45	15	5
Profit of each no. Being sold	0.15	0.20	0.45	0.15	0.05

B) i) A man's property is shared among his sons A,B, and C. The ratio of A's share to B's share is 7:5 and the ratio of B's share to C's share is 9:7. If B recieved Rs. 3600/- more than C, Find the value of the Property and the share received by each son. (4)

ii) In each of the following examples, find the ratio which the first Quantity bears with the second (3)

1) 80 paise, Rs. 4 2) 1 min 15 seconds 3) 75 cm, 2m.

P.T.O.

OR

Q.4 A) If $f(x) = 1 + 2x$, $g(x) = \frac{x}{2}$ (6)

Show that $f(g(x)) - g(f(x)) = \frac{1}{2}$

B) Find $\frac{dy}{dx}$ where, (4)

i) $y = (x^2 + 2x - 3) \log x$

ii) $y = x^2 e^x$

C) Find consumer Surplus and Producer Surplus defined by the equilibrium of the demand curve $P = 26-5x$ and the supply curve $P = 4x + 8$. (5)

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