VCD/(21)/123 **FYBIM SEM I QUANTITATIVE TECHNIQUES $2\frac{1}{2}$HRS 75 marks**

Note: 1) Figures to the right indicate full marks.
2) Use of simple calculator is allowed.

Q.1 (A) Fill in the blanks using correct alternatives: (Any Eight) (8)

1) The mode of 12, 34, 56, 78, 12, 45 is
   a) 12 b) 56 c) 45 d)7
2) _____ is measure of dispersion.
   a) mean b) median c) mode d) decile
3) C. V. is calculated by the formula
   a) $\frac{\bar{X}}{\sigma} * 100$ b) $\frac{\bar{X}}{\sigma}$ c) $\frac{\sigma}{\bar{X}}$ d) $\frac{\sigma}{\bar{X}} * 100$
4) There are _____ regression coefficient.
   a) 5 b) 2 c) 3 d) 4
5) The slope of regression line of Y on X is
   a) b_{xy} b) b_{yx} c) $\frac{1}{b_{xy}}$ d) $\frac{1}{b_{yx}}$
6) An annuity in which each payment made at the end of the year is
   a) annuity due b) annuity certain
   c) immediate annuity d) uniform annuity
7) An annuity in which number of payments are infinite is
   a) infinity b) foreverity c) perpetuity d) equitable
8) If $y = e^x, then \frac{dy}{dx} =$
   a) e^x b) $e^x \log x$ c) x^e d) 0
9) $f(x) = 20 - 4x$ is a _____ function.
   a) logarithmic b) constant c) linear d) exponential
10) The word average refers to _____.
   a) Arithmetic mean b) median c) mode d) quartile

(B) State whether following statements are true or false: (Any seven) (7)

1) The derivative of $\log 5$ is $\frac{1}{5}$.
2) The graphical representation of linear function is always a line.
3) The Present value is always more than the future value.
4) In uniform annuity, all payments are equal.
5) Coefficient of correlation lies between 0 and 2.
6) If $r^2 = 0.49$ $then$ $r - 0.7$.
7) Mean deviation can be calculated only from median.
8) If variance is 9, then standard deviation is 3.
9) Mode can be obtained by Histogram.
10) A statistical measure calculated for all units in the sample is called parameter.

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Q.2)(A) If the demand function is given by $p = D^2 - 7D + 100$ where p = price and D = demand then find (8)

i. Total revenue
ii. Average revenue
iii. Marginal revenue when demand is 4

(B) Find the present value of an immediate annuity of ₹ 20,000 is invested at 12% p.a. compounded half yearly. (7)

OR

(C) Find the mode for the data: (7)

Days	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
No. of workers	15	20	25	18	16	19

(D) Find the Standard Deviation for the data: (8)

Life(hrs)	60 – 80	80 – 100	100 – 120	120 – 140	140 – 160
No. of tubes	20	60	80	30	10

Q.3) (A) Find range and coefficient of range for the following set of data: (7)
160,130,125,127,147,150,155

(B) Find the present value of ₹ 35,000.78 to be paid in 5 years from now with rate of compounding at 6% p.a. (8)

OR

(C) Find the coefficient of correlation for the given data: (7)

$\sum(X - \bar{X})(Y - \bar{Y}) = 92$
$\sum(X - \bar{X})^2 = 56$
$\sum(X - \bar{Y})^2 = 156$

(D) Find the rank coefficient for the following data: (8)

Rank 1	2	3	5	1	6	7	3	8
Rank 2	6	4	7	4	2	1	4	8

Q.4) (A) Find the simple interest on ₹ 5.000 for 8 years at 5% p.a. Also find the amount after 8 years. (7)

(B) Find mode using Histogram: (8)

Height	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80
No. of students	15	20	30	35	20	5	32

OR

(C) Find the amount of a 3 years F.D. of ₹ 5,00,000 at 10% p.a. if interest is compounded (8)

i. Annually
ii. Quarterly

(D) The distribution of workers are given below. Find P_{15} *and* P_{55}. (7)

Time(hrs)	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
No. of Workers	25	35	50	65	20

Q.5) (A) State the pre-requisites of good questionnaire. (8)

(B) Explain various sources of secondary data. (7)

OR

(C) Answer any three of the following: (15)

i. Merits and demerits of mode
ii. Explain Elasticity of demand
iii. Explain scatter diagram
iv. Explain biased and unbiased errors
v. Explain annuity and types of annuity