Paper 4 - Fundamentals of Business Mathematics and Statistics

Paper 2 - Fundamentals of Business Mathematics and Statistics

Full Marks:100 **Time allowed: 3 hours**

Section-A

I. Choose the Correct Answer: **[1 × 8= 8]**

1. Find the 8th term of the series 4, -8, 16, -32…….
   (i) -512 (ii) 512 (iii) -521 (iv) 521
2. Find G.M of 2 and 6
   (i) ± 4 (ii) ±√3 (iii) ± 2 (iv) ± 2√3
3. If the sum of three numbers in A. P is 18, then what is the middle term?
   (i) 6 (ii) 4 (iii) 8 (iv) 10
4. The 3rd and 6th terms of a G. P are 3 and 81 respectively, find the common ratio
   (i) 1 (ii) 2 (iii) 3 (iv) 4
5. If ${}^{8}C_r - {}^{7}C_3 = {}^{7}C_2$ then r = _____
   (i) 3 (ii) 4 (iii) 2 (iv) 6
6. $3X^2 + 6x + 3 = 0$ then the roots of the equations are –
   (i) (3, 3) (ii) (-1, -1) (iii) (2, 4) (iv) (4, 1)
7. $(\log_5 3) \times (\log_3 625)$ equal:
   (i) 1 (ii) 2 (iii) 3 (iv) 4
8. The compound interest on ₹500 for 2 years at 10% p. a
   (i) 100 (ii) 105 (iii) 110 (iv) 120

II. State whether the following statements are True (or) False: **[5 × 1 = 5]**

1. If the roots of the equations $2x^2+8x+c = 0$ are equal then c = 8
2. The degree of the equation $3x^5 + xyz^2 + y^3$ is 3
3. Log3 + log 5 is log 15
4. The number of permutations if the letter in the word "BANANA" is which two letters N do not come together is 60.
5. There 11 distinct books, among them 6 books can be arranged in a shelf. The number of arrangements so that 3 particular books will be always side by side is 8064.

III. Fill in the blanks: **[5 × 1 = 5]**

1. If the equations $x^2+7x+12 = 0$ and $x^2+mx+5 = 0$ have common roots, the value of m is equal to ……
2. If $\log_{32} x = 0.8$ then x is equal to: ----------
3. The value of $\log_2 (\log_5 625)$ is: ----------
4. If $a^{1/3} + b^{1/3} + c^{1/3} = 0$ then $(a + b + c)^3$ = ……
5. The number of ways in which the letters of the word "VOWEL" can be arranged so that the letters O, E occupy even places is ……

IV. Choose the fowling Any Three Short Question: **[2 ×3 = 6]**

1. If ${}^{18}C_r = {}^{18}C_{r+2}$ find the value of ${}^{r}C_5$
2. Find out — ${}^{4}P_2 \div {}^{4}C_2$
3. If a, ar, ar^2, ar^3 …..be in G. P. find the common ratio.
4. The product of 3 consecutive terms in GP his 27/8. Find the middle term.

V. Answer any four Questions: **[4×4 = 16]**

1. If $\frac{a}{4}=\frac{b}{5}=\frac{c}{9}$, prove that $\frac{a+b+c}{c}=2$.
2. If $\frac{P}{b-c}=\frac{Q}{c-a}=\frac{R}{a-b}$ prove that P + Q+ R = 0
3. A sum of ₹1,200 was lent out for 2 years at simple interest. The lender got ₹1,536 in all . Find the rate of interest p. a.
4. If the 7^{th} and 11^{th} terms of a A. P. are (-39) and 5 respectively then find out the 24^{th} term.
5. Show that $\left(\frac{x^b}{x^c}\right)^a \times \left(\frac{x^c}{x_a}\right)^b \times \left(\frac{x^a}{x^b}\right)^c = 1$
6. Prove that $10g_a^m + \log_a^n = \log_a^{mn}$

Section-B

VI. Choose the Correct Answer: **[1×10=10]**

1. Statistics is applied in
   (i) Economics (ii) Business Management (iii) Commerce and industry
   (iv) All these
2. A Qualitative characteristic is know as
   (i) An attribute (ii) A discrete variable (iii) A continuous variable
   (iv) None of above
3. The quickest method to collect primary data is
   (i) Personal interview (ii) Indirect interview (iii) Telephone interview
   (iv) By observation
4. "Stub" of table is the
   (i) Left part of the table describing the Columns
   (ii) Right part of the table describing the columns
   (iii) Right part of the table describing the rows
   (iv) Left part of the table describing the rows
5. Median of distribution can be obtained from
   (i) Less than type O gives
   (ii) Point of intersection of less than and greater than Ogives
   (iii) Both a and b
   (iv) None of these
6. If each item is reduced by 15, AM is
   (i) Reduced by 15
   (ii) Increased by 15
   (iii) Reduced by 10
   (iv) None
7. If y = 5x -20 & $\bar{x}$ = 30 then the value of $\bar{y}$ is
   (i) 130 (ii) 140 (iii) 30 (iv) None
8. If Median = 5, quartile Deviation = 2.5 then the coefficient of Quartile deviation is -
   (i) 20 (ii) 50 (iii) 125 (iv) 5
9. The most commonly used measure of dispersion is
   (i) Range (ii) Standard (iii) Coefficient of variation
   (iv) Quartile deviation

10. The value of correlation coefficient lies between
(i) -1 and + 1 (ii) -1 and 0 (iii) 0 and 1 (iv) None

VII. State whether the following statements are True (or) False: [8 × 1 = 8]

1. Mode is the value that has maximum frequency
2. Harmonic mean is always less then geometric mean.
3. The sum of individual observations from mean is zero
4. Range is the value of difference between mode and median.
5. Median can never be equal to mean in a skewed distribution
6. The arithmetic mean is always the best measure of central tendency
7. Mean deviation can never be negative
8. In a normal distribution S. D. > M. D. > Q. D.

VIII. Fill in the blanks: [8 × 1 = 8]

1. Graphical method of calculating dispersion is ……..
2. If the Co-efficient of skewness is zero, the distribution is ……..
3. For calculating mean deviation, generally deviations are taken from ……..
4. A distribution with two modes is called ……..
5. The average based on reciprocals to the numbers is ……
6. A quantitative Characteristic is known as …….
7. ……always lies in between the arithmetic mean and mode.
8. Quartiles can be determined graphically using ……

IX. Define: [2 ×5= 10]

1. Median
2. Mode
3. Quartile
4. Decile
5. Percentile

X. Answer any three Questions: [3×8 = 24]

1. Calculate Mode for the following data **[8]**

X:	0-10	10-20	20-30	30-40	40-50	50-60	60-70
F:	4	13	21	44	33	22	7

2. From the following data find quartile deviation and its coefficient. **[8]**

x	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50
f	8	10	12	15	10	7	8	5

3. From the following data compute the co-efficient of correlation between x and y: **[8]**

	X Series	Y Series
No. of items	15	15
Arithmetic Mean	25	18
Square of deviations from mean	136	138

Summation of product of deviations of X and Y series from their respective Arithmetic mean is 122.

4. (a) If an unbiased coin is tossed twice, find the probability of obtaining at least one head.

[4]

(b) If two unbiased coins are tossed, find the probability of obtaining one head and one tail. **[4]**