**Q.P. Code :19966**

**[Time: 2 ½ Hours]** **[ Marks:75]**

Please check whether you have got the right question paper.

N.B:
1. All questions are compulsory carrying 15 marks each.
2. Figures to the right indicate marks of sub-questions.
3. Use of simple calculator is allowed

Q.1 A) Fill in the blanks by choosing appropriate option. (**any eight**) 08

1) Supply function gives the relation between supply and ----------
   a) Price
   b) Demand
   c) Cost
   d) None of these

2) If the highest value in a group of observation is 90 and the lowest value is 50 then range is -------
   a) 40
   b) 50
   c) 60
   d) None of these

3) Median of 7, 8, 3, 4, 6 is ---------
   a) 6
   b) 5
   c) 5.6
   d) None of these

4) $f(x) = 6 + 3x$ is ---------- function.
   a) Linear
   b) Constant
   c) Logarithmic
   d) None of these

5) In --------- years Rs. 8,000 will amount to Rs. 8,840 at 3.5 % p.a. simple interest.
   a) 2
   b) 3
   c) 4
   d) None of these

6) An annuity in which the number of payments is fixed, is called ----------
   a) Annuity certain
   b) Fixed annuity
   c) Limited annuity
   d) Immediate annuity

7) At maxima, the second order derivative is ----------
   a) Less than zero
   b) Greater than zero
   c) Zero
   d) None of these

8) If $y = (x^2 - 4x + 3)$ then $\frac{dy}{dx}$ is --------
   a) $2x - 4$
   b) $x^3 - 4$
   c) $4x + 3$
   d) None of these

9) If the nominal rate of interest is 9% per annum compounded quarterly, then the effective rate of interest per annum is ---------- the nominal rate of interest.
   a) Equal to
   b) Less than
   c) Greater than
   d) The 4th root of

10) For two regression lines $x + 2y = 5$ and $2x + 3y = 8$, the mean value of x & y is
   a) (1, 2)
   b) (2, 1)
   c) (1, 1)
   d) None of these

B) State whether true or false (**any seven**) 07

1) If elasticity is between zero and one, the demand is inelastic.
2) The coefficient of correlation 'r' always lies between -1 and +1.
3) Another name for quartile deviation is semi-inter quartile range.
4) An annuity is a sequence of payments made at successive time periods.
5) The present value is always more than future value.
6) Sample survey is less expensive
7) A statistical measure calculated for all units in the sample is called parameter.
8) Arithmetic mean is a positional average.
9) EMI stands for Equated Monthly Installments.
10) If $f(x) = e^x + 10x$ then $f(0) = 11$

Q.2 a) Find the standard deviation for the following data: 08

| Life in hours | 60-80 | 80-100 | 100-120 | 120-140 | 140-160 |
|---|---|---|---|---|---|
| No. of tubes | 20 | 60 | 80 | 30 | 10 |

b) Find the correlation coefficient for the following data. 07

| X | 15 | 18 | 20 | 19 | 22 |
|---|---|---|---|---|---|
| Y | 10 | 11 | 13 | 12 | 14 |

**OR**

p) Find the regression of X and Y for the following data. 08

| X | 9 | 14 | 20 | 27 | 40 |
|---|---|---|---|---|---|
| Y | 3 | 5 | 8 | 10 | 14 |

q) Find the rank correlation coefficient for the following data. 07

| Rank 1 | 5 | 4 | 3 | 1 | 2 |
|---|---|---|---|---|---|
| Rank 2 | 4 | 2 | 1 | 3 | 5 |

Q.3 a) Find the derivative of y w.r.t x. 08

i) $y = (x^4 + x^2 - 4)\,(\log x + e^x)$

ii) $y = \frac{x-4}{5^x + 3x^2}$

b) Find the mode for the following data. 07

| Income in Rs. | 100-200 | 200-300 | 300-400 | 400-500 | 500-600 |
|---|---|---|---|---|---|
| No. of Persons | 120 | 200 | 170 | 220 | 80 |

**OR**

p) If the total cost (C) and total revenue (R) of a company are given by $C = 20 + 4x$ and $R = 30\,x - x^2$, where x is output, find the output at which the profit is maximum. What is the maximum profit? 08

q) Find the median for the following data. 07

| Earning in Rs. | 100-120 | 120-140 | 140-160 | 160-180 | 180-200 |
|---|---|---|---|---|---|
| No. of shops | 15 | 35 | 60 | 50 | 40 |

Q.4 a) A TV is purchased for Rs. 5,000 cash down and Rs. 10,000 at the end of each month, for 4 months. Find the cash price of the TV if the payments include interest payments at 12% p.a compounded monthly. 08

b) Find the maturity amount of a two year fixed deposit of Rs. 2,00,000 at 5% p.a. if the interest is compounded semi-annually. 07

**OR**

p) Find the EMI using reducing balance method if a loan of Rs. 60,000 is to be returned is 3 equal monthly installment, the rate of interest being 12% p.a. 08

q) The total revenue and the total cost of producing and selling x units of a commodity are R =270x and C= 3, 00,000 + 70x. Find the break – even point. 07

Q.5 a) Discuss the functions of statistics. 08

b) Define correlation and types of correlation. 07

**OR**

Write short notes on **any three** of the following. 15

1) Merits and demerits of mode
2) Scatter diagram
3) Define annuity and its types
4) Methods of collecting primary data
5) Merits and demerits of standard deviation

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