Sample questions .

Subject : Mathematical & Statistical Techniques II

UNIT II

1. Guddi invested some money in a bank at a rate of 6% per annum. At simple interest, after 9 years, she got Rs. 8470. How much did she invest?

   (a) Rs. 5250 (b) Rs. 6550 (c) Rs. 6400**(d) Rs. 5500**

2. If Rs. 100 amounts to Rs. 132 at simple interest in 4 years, then the rate of interest is

(a) **8%** (b) 6% (c) 5% (d) 10%

3. In how many years the principal will double at a simple interest of 4 % per annum?

(a) 20 (b) 10 (c) 15 **(d)25**

4. An amount of Rs. 6500, at simple interest of 8% per year, will yield how much in 2 years?

(a) Rs. 6300 **(b) Rs. 7540** (c) Rs. 6600 (d) Rs. 7800

5. At what rate percent on simple interest will Rs.750 amount to Rs.900 in 5 years?

(a) 5% **(b) 4%** (c) 3% (d) 6%

6. A certain sum of money at simple interest amounted to Rs.840 in 10 years at 3% per annum, find the sum?

(a)Rs.500 (b) Rs. 678 (c) 560 **(d)646**

7. What sum will become Rs 73, 205/- in 4 years, if the rate of interest is 10% compounded yearly?

(a) Rs.40,000 (b) **Rs. 50,000** (c)Rs. 60,000 (d)Rs.45,000

9. Find the amount received when a sum of Rs. 12,000 is invested at 15% per annum for 2 years, If the interest is compounded half yearly?

(a) Rs. **16,025.63** **(b)** 16121.23 (c) Rs. 16231.34 (d) Rs.16342.12

10. Find the present value of an ordinary annuity of Rs.3,500 per year for 3 years at 12% per annum?

a) Rs. 9321.23 (b) Rs. 8721.23 (c) **Rs.8406.41**(d)Rs.8954.21

11. The compound interest on Rs.2500 for 5 years at 4% per annum (compounded

annually) is

(a)Rs.432 **(b)Rs.542** (c)Rs.435 (d)Rs.640

UNIT I

12.demand function $D = 70 + 9p - p^3$, the demand when price is 2 is

(a) 80 (b) 96 (c) 84 (d) 92

13.the supply function $S = p^3 - 6p^2 + 75$, the supply when the price is 5 is

(a) 25 (b) 75 (c) 100 (d) 50

14.total revenue for $D = 5 - p + \frac{4}{p^2}$ and $p = 2$ is

(a) 9 (b) 4 (c) 8 (d) 6

15.average cost function for $C = 100 - x + x^2$ is

(a) $\frac{100}{x} - 1 + x$ (b) $100x - x^2 + x^3$

(c) 100 (d) $100 + x^2$

16.equilibrium price for demand function $D = 20 - p$ and supply function $S = p$ is

(a) $p = 20$ (b) $p = 0$ (c) $p = 10$ (d) $p = 5$

17.derivative of $2x^2 + 5x + e^x$ is

(a) $2x^2 + x + e^x$ (b) $4x + 5 + e^x$ (c) $2x + 4$ (d) $3x^2 + 6$

18.derivative of $x + \log x$ is

$x + 1$ (b) $1 + \frac{1}{x}$ (c) $1 + \log x$ (d) $x + \frac{1}{x}$

19.derivative of x^2e^x is

(a) $2xe^x + x^2e^x$ (b) $2xe^x$ (c) $2x + e^x$ (d) $x^2 + e^x$

20.derivative of $\log xe^x$ is

(a) $\frac{1}{x}e^x + \log xe^x$ (b) $\log xe^x$ (c) $\frac{1}{x}e^x$ (d) $\frac{1}{x} + e^x$

21.derivative of $7^x \log x$ is

(a) $7^x \log 7 \log x + \frac{7^x}{x}$ (b) $\frac{7^x}{x}$ (c) $7^x \log 7 \log x$ (d) $7^x \log 7$

22.$f(x) = x^2 + 2x + 650$ then $f''(x)$ is

(a) $2x + 2$ (b) $2x$ (c) 2 (d) 650

23.A point of maxima for the function $f(x) = x^2 + \frac{16}{x^2}$ is

(a) ±2 (b) ±4 (c) ±32 (d) ±8

24.The total cost function $C = 100 + \frac{4000}{x} + \frac{x}{10}$ where x is the number of units. The ue of x for which total cost is minimum is

(a) 200 (b) -200 (c) 400 (d) -400

UNIT III

25.The correlation is positive if

(a) x increases as y increases (c) x decreases as y decreases
(b) Both (a) and (b) (d) x increases as y decreases

26.When r = 1, all the points on the scatter diagram would lie

(a)On a straight line (b) on a straight line directed from left to right

(a) From lower right to upper right (d) all points are on y-axis

27.The covariance between the two variable is_____

(a)Purely positive (b)Purely negative

(c)Either positive, negative (d)Either positive, negative or zero

28.The rank correlation coefficient of marks in statistics and marks in Accountancy

Obtained by a certain group of students is 0.8. Sum of squares of differences of ranks is given to be 33, then the number of students in group is

(a) n = 10(b)n = 12(c) n = 9(d)n = 13

29.Karl Pearson's coefficient of correlation between two variables x& y is 0.32. Their covariance is 15. The variance of x is 9.find the standard deviation of y

(a) 15.625(b) 15.666(c)15.156(d)14.962

30.Find spearman rank correlation between X and Y for the following data:

X	13	20	22	18	19	11	10	15
Y	17	19	23	16	20	10	11	18

(a) 0.5552 (b)0.5555(c)0.5952(d) 0.5999

32.If $\sum(x- \bar{x})(y- \bar{y}) = 55$, n = 9 then find covariance of x and y is

(a) 6.66(b) 6.11(c)66.2(d) 6.99

33.For the data give below :

x	2	3	4
y	3	5	7

34.Find arithmetic mean of x and y ?

(a) 3 and 5(b) 5 and 5(c)5 and 3 (d) 5 and 6

35.Given $b_{yx} = \frac{4}{5}$ and $b_{xy} = \frac{9}{20}$, then r = ?

(a) $\pm\frac{5}{3}$ (b) $\pm\frac{2}{5}$ (c) $\pm\frac{3}{5}$ (d) $\pm\frac{1}{5}$

UNIT IV

36.The best method of finding trend is using

a) Freehand method
b) Method of semi average
c) Method of moving averages
d) Method of least square

37.For a time series if the yearly average is 5 and yearly increment is 3 then its equation can be written as

a) =3−5
b) =3+5
c) =5+3
d) 3 =5+

38.Which of the following is not a Time Series

a) Annual export of India
b) Number of books issued every day library
c) Stock price recorded hourly
d) Marks of a student in different subjects.

39. Which of the following is not true for Time Series

a) Time series is an arrangement of data in the order of occurrence with a fixed time interval
b) Secular trend is not a compon of time series.
c) Seasonal variations occur due to weather or custom
d) Secular trend is a component time series.

40.To fit linear trend by least square method the equation of line y = a + bx, then

a) $a = \frac{\sum y}{n}, b = \frac{\sum xy}{\sum x^2}$
b) $a = \frac{\sum y}{\sum x}, b = \frac{\sum xy}{\sum x}$
c) $a = \frac{\sum y}{n^2}, b = \frac{\sum xy}{\sum x^2}$
d) $a = \frac{\sum y}{n}, b = \frac{\sum xy}{\sum x}$

42. For a particular set of data, Laspeyre's Index number is 120 and Paasche's Index

number is 125, then its Fisher's Index number is

a) 122.51 b) 123.47

c) 123.51 d) 122.47

43.Which of the following represent unweighted index number

a) $\frac{\sum p_1}{\sum p_0}\times 100$ b) $\frac{\sum p_1 q_0}{\sum p_0 q_0}\times 100$

c) Paasche's index number d) $\frac{\sum p_1 w}{\sum p_0 w}\times 100$

44. The index number using Simple aggregative method

a) $\frac{\sum p_0}{\sum p_1}\times 100$ b) $\frac{\sum p_1}{\sum p_0}\times 100$

c) $\frac{\sum p_1}{\sum q_1}\times 100$ d) $\frac{\sum q_1}{\sum p_1}\times 100$

UNIT V

45.If in a Poisson distribution P(0) = P(1) then

(a) mean = variance (c) mean = 2×variance

(a) variance = 2×mean (d) mean ≠ variance

46.If the probability that an individual will have a reaction after a particular drug is injected is 0.0001 and 20000 individuals are given injection then the probability that more than two have a reaction taking e^{-2} = 0.135 is

(a) 0.345 (b) 0.325 (c) 0.64 (d) 0.55

47. In a manufacturing process 0.5% of the goods produced are defective. If a sample of 400 goods is considered then the probability that atmost 2 are defective taking e^{-2} = 0.135 is

(a) 0.325 (b) 0.675 (c) 0.375 (d) 0.625

48. In a Poisson distribution if the ratio of probabilities of x = 0 and x = 1 is 1:4, the probability of x = 3 with e^{-4} = 0.0183 is

1.135 (b) 0.378 (c) 0.186 (d) 0.1952

49. For a binomial distribution containing 14 independent Bernoulli trials, if the probability of failure is $\frac{4}{7}$ then the variance is

(a) $\frac{24}{7}$ (b) $\frac{21}{7}$ (c) $\frac{16}{7}$ (d) $\frac{4}{7}$

50. For a binomial distribution containing 10 independent Bernoulli trials, P(success)= $\frac{2}{5}$ in any trial. Then mean is=?

(a) 4 (b) 6 (c) 4.5 (d) 3

51.For a binomial distribution, mean= 5 and standered deviation is 2 , then p = ?

(a)$\frac{2}{5}$(b)$\frac{1}{5}$(c) 5 (d)$\frac{5}{2}$

For a normal distribution mean is 50 and standard deviation is 15. Then the limits of middle 50% of the observation is (a) 40 and 60(b)50 and 40 (c) 60 and 40 (d) 40 and 70
For a given normal distribution with variable X, mean 30 and standard deviation 5. The area under curve for (30 < X < 42) is (a)0.984 (b) 4.098 (c) 44.98 (d) 0.498
An unbiased coin is tossed 5 times. Then the probability of getting almost one head is (a)$\frac{3}{16}$(b)$\frac{3}{14}$(c)$\frac{16}{3}$(d)$\frac{3}{7}$
For a Poisson distribution with standard deviation of 2 units, find the probability for x < 3 (a)0.3281 (b) 0.2381 (c) 81.23 (d) 23.81