

**SECTION-A****I Answer TEN of the following questions:****10 x 1 = 10**

- 1 Define Vital Statistics.
- 2 Which index number does not satisfy unit test?
- 3 Define consumer price index number.
- 4 What is Histogram?
- 5 Give an example for Bernoulli Variate.
- 6 What is the value of  $\beta_1$  for t-distribution?
- 7 What is parameter space?
- 8 Define confidence coefficient.
- 9 What is the unbiased estimator of population mean?
- 10 Give an example for defect.
- 11 If the value of game is 8, What is the value of maximin?
- 12 When is L.P.P said to have unbounded solution?

**SECTION-B****II Answer any TEN of the following questions:****10 x 2 = 20**

- 13 Is NRR exceeds GRR? Give reason.
- 14 State conditions to satisfy TRT and FRT.
- 15 Find CPI from the following data.

Group	A	B	C	D
Group Index	100	120	130	110
Weight	2	3	1	4

- 16 Mention four components of time series.
- 17 Write down the condition's for applying Newton's advancing difference method of interpolation.
- 18 If  $Q_1 = 30$  and  $Q_3 = 70$ , find the mode of the normal distribution.
- 19 Write two conditions for applying  $\chi^2$  - test for independence of attributes.
- 20 What are one tailed and two tailed tests?
- 21 A lot contains 2% defective items. 60 items chosen from it. Another lot contains 1% defective items. 40 items chosen from it. Find S.E. ( $p_1 - p_2$ ).
- 22 Write two advantages of acceptance sampling.
- 23 Mention the methods of obtaining initial basic feasible solution for a T.P.
- 24 The cost of a machine is ₹6,000. The fourth year cumulative running cost is ₹6,200. Assuming that resale value is negligible, find the annual average cost.

**SECTION-C****III Answer any EIGHT of the following questions:****8 x 5 = 40**

- 25 From the following data, calculate total fertility rate.

Age (in years)	Female Population	Number of live births
15-19	50,000	1000
20-24	60,000	7000
25-29	45,000	8000
30-34	40,000	5000
35-39	25,000	100
40-44	20,000	50
45-49	10,000	-

26 Calculate the weighted G.M price index number from the following data.

Item		A	B	C	D	E
Weight in %		30	15	20	10	25
Price (₹)	Base year	100	20	70	20	40
	Current year	90	20	60	15	55

27 Write down the uses of cost of living index number.

28 Obtain trend values by 3 yearly moving averages for the following data.

Year	2001	2002	2003	2004	2005	2006	2007
Population (in millions)	412	438	446	454	470	483	490

29 Following is data regarding annual net life insurance premium. Using Newton’s advancing difference method estimate the premium at the age of 26 years.

Age (in years)	20	25	30	35
Premium (in ₹)	1426	1581	1771	1996

30 The probability that a bomb hits a target is  $\frac{1}{2}$ . Four bombs are aimed at a bridge. 3 bombs are enough to destroy the bridge. What is the probability that i) the bridge is destroyed, ii) none of the bombs hit the bridge.

31 There are 15 lecturers in a college out of them 8 belong to commerce faculty. The college management builds 5 residential quarters and allots them to 5 randomly selected lecturers. Find the probability that i) all the quarters are allotted to commerce lecturers, ii) three quarters are allotted to commerce lecturers.

32 A sample of 100 students is taken from a college. If the mean and S.D of their weights are 51 kg and 5 kg respectively, test at 1% level of significance that the average weight of college students is 50 kg.

33 A milk filling machine fill sachets with milk. The contention is that standard deviation of quantity of milk filled is more than 3ml. To test this, 24 sachets are randomly selected and their contents noted. If the standard deviation of these observations is 3.8ml. What is your conclusion?

34 The measurement of 8 subgroups of samples of size 4 each gave the following results:  
 $\bar{X} = 33.3$  and  $\bar{R} = 8.2$ . Write down the control limits for  $\bar{X}$ -chart.

35 Solve the following game by dominance principle.

		Player B		
		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>
Player A	A <sub>1</sub>	6	12	7
	A <sub>2</sub>	7	9	8
	A <sub>3</sub>	5	8	9
	A <sub>4</sub>	3	6	10

36 Maruthi Udyog Company purchases 10,000 rear mirrors for cars annually. The ordering cost per order is ₹12. Each mirror costs ₹50 and the annual inventory carrying cost is 12% of capital cost. Compute EOQ and the minimum average inventory cost.

**SECTION-D**

**IV Answer any TWO of the following questions:**

**2 x 10 = 20**

37 For the following data, compute GRR and NRR and comment on the result.

Age (in years)	Female Population	Female births	Survival rate
15-19	16000	480	0.91
20-24	14500	812	0.90
25-29	13000	650	0.89
30-34	11500	460	0.38
35-39	10000	300	0.87
40-44	8700	87	0.86
45-49	7500	30	0.87

38 From the following data compute Marshall-Edgeworth’s, Dorbish-Bowley’s and Fisher’s quantity index numbers.

Item	Base Year		Current Year	
	Price (₹)	Value (₹)	Price (₹)	Value (₹)
A	5	25	10	60
B	1	10	2	24
C	4	14	8	40
D	2	40	5	75

39. For the following data fit an exponential trend. Estimate the products for the year 2012.

Year	2005	2006	2007	2008	2009	2010
Production (in crores)	7	10	12	14	17	24

40 Records of 800 familes about the number of male births in a family of four children are given below:

Male births	0	1	2	3	4
No. of families	46	194	270	230	60

Test the hypothesis that male and female births are equally likely at 5% level of significance.

**SECTION-E**

**(Practical Oriented Questions)**

**V Answer any TWO of the following questions:**

**2 x 5 = 10**

41 If X is a normal variate with mean 64 and variance 4, find the probability that  
i)  $X > 60$  ii)  $X < 66$

42 In a random sample of 1000 persons from a large population, 470 are women. Can we conclude that men and women are in the equal ratio in the population? (Use 1% L.O.S)

43 Of the 500 workers in a factory exposed to an epidemic, 350 were attacked, 200 had been inoculated and of these 100 were attacked. Test whether inoculation and attack of epidemic are independent.

44 Find an initial basic feasible solution to the following transportation problem by Matrix Minima Method and compute the transportation cost.

From		To			Available
		A	B	C	
	I	50	30	220	10
	II	90	45	170	30
	III	270	200	50	40
	Required	40	20	20	

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