Jain College, Jayanagar
II PUC Second Mock Paper Jan- 2020
Subject: Statistics (31)

Duration: 3.15 minutes **Max.Marks:100**

Note: 1. Graph sheets and statistical tables will be supplied on request.
2. Scientific calculators are allowed.
3. All working steps should be clearly shown.

Section– A

I. Answer any TEN of the following questions: **10× 1 = 10**

1. Define fecundity.
2. If the quantity index number for current year is 80, then what would you conclude?
3. State the condition required to satisfy circular test.
4. Mention a use of time series.
5. If variance of chi-square variate is 16, what is its mean?
6. Write the mean of t-distribution.
7. Write the formula of SE(p).
8. What is level of significance?
9. Define type II error.
10. Which type of cause of variation is detected by SQC?
11. Define rectangular game.
12. Mention a need for replacement of equipment.

Section– B

II. Answer any TEN of the following: **10 × 2 = 20**

13. Mention two methods of obtaining vital statistics.
14. The sum of price relatives of 5 different commodities is 200. Find a suitable unweighted price index number.
15. Why Fishers index number is called as an ideal index number?
16. Define secular trend. Give an example.
17. Differentiate between interpolation and extrapolation.
18. In a Poisson distribution the first probability term is 0.3679. Find the next probability term.
19. Under what conditions hyper geometric distribution tends to binomial distribution?
20. Define size of a test and power of a test.
21. Mention two applications of χ^2-test.
22. Write down the control limits for d-chart when standards are not given.
23. Mention two methods of obtaining initial basic feasible solution for a T.P.
24. Given, R=3600 units/year, C_3=Rs.50/cycle and C_1=Rs.4/unit/year, find Q^0.

Section – C

III. Answer any EIGHT of the following: **8 × 5 = 40**

25. Find GRR from the following data. Obtain the average number of female children born to woman of child bearing age

Age (in years)	Female Population	Female births
15-19	10000	200
20-24	9000	540
25-29	8000	400
30-34	7000	280
35-39	6000	180
40-44	5000	100
45-49	4000	40

26. Compute suitable price index number for the following data. Comment on the result

Item	Price (Rs.)		Quantity of Consumption
	2010	2012	
A	10	12	20
B	16	18	15
C	9	10	10
D	11	14	25

27. For the following data calculate the consumer price index number by family budget method.

Group	Price (in Rs.)		Weight
	2005	2010	
Food	3000	3600	10
Housing	4000	5000	12
Clothing	2000	1600	5
Fuel	1000	1400	15
Miscellaneous	1200	1500	5

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

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Sales (‘000)	75	60	55	60	65	70	70	75	85	70

29. Following is data regarding annual net life insurance premium. Using binomial expansion method estimate the premium at the age 30 and 45.

Age (in years)	20	25	30	35	40	45
Premium (in Rs.)	1426	1581	-	1996	2256	-

30. Mention five features of binomial distribution.
31. There are 14 fruits in a basket, out of which 8 are mangoes and rests are arranges. A girl picks 5 fruits at random from the basket. Find the probability that she gets 3 mangoes. Also find the mean of mangoes.
32. From a random sample of 100 students of $P \bigcup C$, 13 students were found wearing spectacles, can we conclude that proportion of students wearing spectacles is more than 0.1? use α =0.05.

33. The following data represents the blood pressure of 5 persons before and after performing dhyana.

Person	A	B	C	D	E
B.P. Before dhyana	90	90	100	88	99
B.P. After dhyana	88	90	95	90	96

Can we conclude at 5% level of significance that Dhyana reduces blood pressure?

34. For the following data, find control limits of $\bar{x}$ - Chart, (Given, $A_2 = 0.729$).

Subgroup	1	2	3	4	5	6
Mean	52	49	53	48	51	47
Range	4	6	5	7	3	5

35. Solve the following L.P.P. graphically.

Max $Z=10x+15y$

Subject to, $x+y \geq 10$

$3x+2y \leq 60$

and $x, y \geq 0$

36. Determine an initial basic feasible solution to the following transportation problem by NWCR. Compute the transportation cost.

To

From		D1	D2	D3	Supply
	O_1	8	4	12	500
	O_2	10	5	6	200
	O_3	7	5	3	100
	Demand	400	200	200	

Section – D

IV. Answer any TWO of the following: **2 × 10 = 20**

37. From the following data, compute standardized death rates and comment.

Age - group (in years)	Standard Population	Locality A		Locality B	
		Population	Deaths	Population	Deaths
0-20	20,000	8,000	128	6,000	72
20-50	30,000	12,000	60	9,000	54
50-70	35,000	10,000	140	7,000	98
70 & above	15,000	4,000	252	3,000	129

38. Compute Marshall – Edgeworth and Dorbish – Bowleys' price index numbers. Also verify whether Marshall – Edgeworth's index number satisfy TRT using the following data.

Items	Base Year		Current Year	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	2	40	6	50
B	4	50	8	40
C	6	20	9	30
D	8	10	6	20
E	10	10	6	20

39. Below are given the figures of production (in Thousand Tons) of a Sugar factory.

Year	2001	2002	2003	2004	2005	2006	2007
Production	80	90	92	83	94	99	92

(i) Fit a straight line by the method of least squares and obtain the trend values.
(ii) Also estimate the production for the year 2008.

40. Fit a binomial distribution to the following data and test for goodness of fit. Use α =5%.

Number of defective balloons	0	1	2	3	4
Number of packets	6	12	22	24	16

Section – E

V. Answer any TWO of the following: **2 × 5 = 10**

41. The weights of 500 persons are normally distributed with mean 60 kg and S.D. 5 kg. Find the number of persons with weight between 62 kg and 70 kg.
42. A machine is designed to fill 500 ml of milk to polythene bags. A randomly selected 100 milk bags filled by the machine are inspected. The mean milk is found to be 499 ml and S.D. is 5 ml. Is machine functioning properly at 5% level of significance?
43. From the following data, test whether 'education' and 'employment' are independent at 1% level of significance.

Education	Employment	
	Employed	Unemployed
Educated	20	25
Uneducated	15	40

44. Solve the following game by dominance principle.

$$\begin{array}{cc} & \begin{array}{ccc} Player\ B & & \\ B1 & B2 & B3 \end{array} \\ \begin{array}{c} \\ Player\ A \end{array} & \begin{array}{c} A1 \\ A2 \\ A3 \\ A4 \end{array} \begin{bmatrix} 6 & 12 & 7 \\ 7 & 9 & 8 \\ 5 & 8 & 9 \\ 3 & 6 & 10 \end{bmatrix} \end{array}$$

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