JAIN COLLEGE

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Bangalore - 560 098

Date: 2019-2020 ***SUBJECT: STATISTICS***

II PUC
MOCK PAPER 1

Timings Allowed: 3Hsr 15 Minutes. ***Total Marks: 100***

Note

1. Statistical tables and graph sheets will be supplied on request.
2. Scientific calculators may be used.
3. All working steps should be clearly shown.

SECTION – A

I Answer any Ten of the following questions **10 X 1 = 10**

1. What is Radix?
2. Which Index number shows downward bias?
3. Name the Index number which satisfies circular test.
4. Give an example for seasonal variation.
5. In which distribution mean and variance are equal?
6. Write the mean of t- distribution.
7. What is point estimation?
8. Define power of a test.
9. When is the pooling of the frequency done in testing of goodness of fit?
10. What is defect?
11. Mention the mean for replacement of an item.
12. .What is meant by inventory?

SECTION – B

II Answer any Ten of the following questions. **10 X 2 =20**

13. Mention the methods of collection of vital statistics.
14. Write any two limitation of Index number.
15. If $P_{(F)}$=123.87 and $P_{(L)}$=125. Find $P_{(p)}$
16. Define interpolation and extrapolation.
17. Write any two demerits of least square method.
18. If q=0.4 for a Bernoulli distribution. Find mean and variance for the distribution.
19. Under what condition does the hyper geometric distribution tends to binomial distribution.
20. A random sample of size 36 is drawn from a population with SD 4. Compute standard error of the sample mean.
21. What do you mean by critical region and power of a test?
22. Mention any two advantages of acceptance sampling plan.
23. Under what conditions is E.O.Q model with shortage applicable.
24. Using maximin minimax principle. Find the value of the following

		Player B	
		B_1	B_2
Player A	A_1	7	3
	A_2	2	2

SECTION – C

III Answer any Eight of the following questions. **8 X 5 = 40**

25. From the following data, calculate STDR for the following data

Age in years	**0 - 20**	**20 - 40**	**40 - 60**	**60 & above**
Population	4000	9000	7000	3000
Deaths	68	54	91	129
Standard population	6000	12000	8000	4000

26. Define Index number. Mention any four uses of index number.

27. Calculate cost of living index number 2010 with base 2005

Items	**P_0**	**P_1**	**Budget**
Food	**225**	**250**	**30%**
Clothing	**70**	**90**	**10%**
Fuel & lightings	**180**	**240**	**20%**
Housing	**60**	**80**	**15%**
Miscellaneous	**125**	**175**	**25%**

28. Obtain trend using 5 yearly moving average method from the following data.

Year	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Production	20	35	42	55	63	77	90

29. Interpolate and extrapolate for the year 2013 and 2016 for the following data

Year	2011	2012	2013	2014	2015	2016
Production	10	18	?	40	54	?

30. The probability of a thermometer manufactured by a firm found to be defective is 0.02. Find the probability that box containing 50 thermometer contain no defective ones. Among 1000 such boxes ,how many contain exactly 2 defective thermometer?

31. Mean and variance of a normal distribution are 20 and 9 respectively. Find Q_1, Q_2, Q_3

32. From the following data ,test whether there is any significant difference between IQ of boys and IQ of girls at α=5%.

	Mean IQ	S.D	Sample size
Boys	125	5	40
Girls	128	3	36

33. A specified brand of automobile tyre is known to have average life of 40000km. A random sample of 10 tyres of this brand, when tested resulted in the average life 39000 and SD 1200km. At 1% L.O.S .What is your conclusion regarding average life of tyres?

34. Solve the following LPP graphically

Maximize Z =12x +40y

S.T $3x + 3y \leq 12$

$6x + 3y \leq 18$

And $x, y \geq 0$

35. For the following data .Find control limits of x chart(A_2=0.729)

Sub group number	1	2	3	4	5	6
Mean	52	49	53	48	51	47
Range	4	6	5	7	3	5

36. The following are maintenance and depreciation costs per year of a vehicle whose purchase price is Rs 50000. When should the vehicle be replaced.

Years	1	2	3	4	5	6	7
Depreciation cost	20000	35000	42500	46250	48000	48000	48000
Maintenance cost	5000	6000	7000	9000	11500	16000	18500

SECTION – D

IV Answer any Two of the following questions. 2 X 10 = 20

37. Calculate GRR and NRR for the following data and comment on the result

Age group	Female population	Female birth	Survival rate
15 – 19	10000	200	0.91
20 – 24	9000	360	0.90
25 – 29	8000	480	0.89
30 – 34	7000	280	0.88
35 – 39	6000	180	0.87
40 – 44	5000	100	0.86
45 - 49	4000	40	0.85

38. From the following data compute Fisher's price index number. Show that $P_{(F)}$ satisfies TRT and FRT

Item	Base year		Current year	
	Price	Expenditure	Price	Expenditure
A	96	768	90	900
B	72	432	100	5000
C	90	1080	160	2400

39. For the following data, fit a straight line trend by least square method. Obtain the trend values and Estimate the production for the year 2008.

Years	2000	2001	2002	2003	2004	2005	2006
Production	50	47	52	45	48	55	60

40. Fit a Binomial distribution for the following data and test at 5% level of significance that Binomial distribution is a good fit

No. of defective items	0	1	2	3	4	5
No .of samples	1	16	48	68	51	16

SECTION – E

V Answer any Two of the following questions. 2 X 5 = 10

41. If x is a normal variate with mean 50 and variance 25, find the probability that
i)P(X<43) ii)P(54≤X<63)

42. From the following 2x2 contingency table test whether result in competitive examination and employee are independent.

	Employed	Unemployed	Total
Pass	9	8	17
Fail	6	7	13
Total	15	15	30

43. Following is the data regarding 5 students administered for an IQ test before and IQ test after treatment. Is the treatment effective.

I.Q before	118	120	116	115	125
I.Q After	125	118	125	120	130

44. There is a demand for 8000 items per year. The ordering cost is Rs 200 and carrying cost is Rs 10 per item per year then find
a) EOQ
b)The minimum average cost

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