SRI BHAGAWAN MAHAVEER JAIN COLLEGE
Vishweshwarapuram, Bangalore 560004
Mock Examination Question Paper-1 (January 2019)

Course:	II PUC	**Subject:**	Statistics
Max. Marks:	100	**Duration:**	3:15 hrs.

***Instructions**:* Do not write or mark anything on the question paper
i) All working steps should be shown clearly.
ii) Scientific calculators may be used.
iii) Statistical tables and graph sheets will be supplied on request

SECTION-A

I. Answer any TEN of the following questions. 10x1=10

1. Define expectation of life
2. Why Paasche's index number shows downward bias?
3. Mention any one limitation of index number.
4. Which component of time series is associated with deaths due to Tsunami?
5. Give an example for Bernoulli variate.
6. For what value of β_1, chi-square distribution is positively skewed given n>2.
7. Write the formula of S.E (P_1-P_2), when $P_1=P_2=P$.
8. What is confidence interval?
9. What is an estimator?
10. SQC helps in detecting which type of variation?
11. In an LPP define unbounded solution?
12. In a T.P. when do you say that a solution is degenerate?

SECTION-B

II. Answer any TEN of the following questions. 10x2=20

13. In a community, in a specific year, 3250 live births occurred. In the case of 35 of the above, the mother died due to complication of child birth. Compute MMR (per 1000).
14. Write down any two uses of consumer price index.
15. State two conditions of least square method of measuring trend.
16. Mention the different methods of interpolation.
17. If a = 5, b=15 and n=3, then find the variance of hyper-geometric distribution.
18. What are the range and mean in a t-distribution?
19. A hospital has 150 doctors out of whom 78 are ladies. When a sample of 35 doctors is taken, find the standard error of proportion of ladies.
20. What are one tailed test and two tailed test?
21. Define sample space and parameter space.
22. Mention any two uses of statistical quality control.
23. Define (i) pure strategy (ii) mixed strategy
24. If the depreciation cost and the cumulative maintenance cost for an equipment for the fourth year is Rs.15000 and 16.600 respectively, Find the annual average cost.

SECTION-C

III. Answer any EIGHT of the following questions. 8x5=40

25. The following table gives the age, sex distribution and the number live births occuring in a year in a population. Compute
(i) General fertility rate.
(ii) ASFR's for the age group (25-29), (30-49)

Age(in year)	0.14	15.19	20-24	25-29	30-39	40-49	≥ 50
Male population	20,730	7,366	7,300	6,030	9,980	7,400	8,400
Female Population	19,840	7,310	7,120	5,860	9,120	6,910	7,900
Live births	0	212	657	592	326	81	0

26. Define index number. Mention four characteristics of index number.

27. An enquiry of middle class families of a certain city revealed that on an average the percentage expenses on different groups were:
Food 25, rent 12, fuel and lighting 20 and others 43 and the respective group indices were 350, 275, 230 and 150. Calculate the Cost of living index number by family budget method.

28. Obtain trend values by 5 yearly moving averages method for the following time series.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Production	15	16	18	18	20	19	22	24	25

29. From the data given below, calculate the number of employees drawing salary less than `15,000.

Salary (in `)	**Number of employees**
upto 10,000	25
upto 20,000	32
upto 30,000	45
upto 40,000	54
upto 50,000	60

30. In a college, 35% of the students are girls. In a random sample of 6 students what is the probability of getting
(i) equal no of boys and girls (ii) only girls.

31. On an average a telephone operator receives 3 telephone calls per minute. Find the probability that in a particular minute she
(i) does not receive any call. (ii) receives more than two calls.

32. From the following data, test whether the difference between the proportions of the populations from which the two sample drawn is significant. Use 5% level of significance.

Sample	1	11
Size	100	400
Proportion	0.02	0.01

33. Following is the data represents the Blood pressure of 5 persons before and after performing Dhyana .

Person	A	B	C	D	E
Blood pressure before Dhyana	90	90	100	88	99
Blood pressure after Dhyana	88	90	95	86	96

Can we conclude at 1% level of significance that Dhyana reduces blood pressure?

34. Twenty pieces of cloth out of different rolls contained respectively 1,4,3,2,5,4,6,7,2,3,2,5,7,6,4,5 2,1,3,8 imperfections. Calculate control limits for suitable control chart.

35. Solve the following LPP graphically

$Max\ Z = 5x + 4y$

s.t $4x + y \geq 40$

$2x + 3y \leq 60$

and $x, y \geq 0$.

OR

(For visually challenged)

Explain steps involved in the construction of LPP.

36. The demand for a commodity is at a constant rate of 200 units per year. There is an inventory if which set-up cost is Rs.1, 000 per production run, holding cost is Rs.10/unit/year and shortage cost is Rs.12 unit/year. Find the Economic Order Quantity and maximum shortage level.

SECTION-D

IV. Answer any TWO of the following questions. **2x10=20**

37. Compute standardized death rates for the two cities A and B. by taking city A population as standard and comment on the results.

Age group (years)	**Town A**		**Town B**	
	Population	**Deaths**	**Population**	**Deaths**
0-9	12000	220	15000	280
10-19	13000	100	12000	150
20-39	15000	50	20000	95
40-59	13000	65	15000	120
60 and above	5000	150	8000	175

38. From the data given below, calculate Marshall-Edgeworth's , Dorbish-Bowley's and Fisher's price index number.

Item	**2006**		**2010**	
A	**Price**	**Expenditure**	**Price**	**Expenditure**
A	8	400	10	600
B	4	320	5	500
C	6	420	6	360

39. Below are given the production (in quintals) figures of a factory. Fit a quadratic trend and Estimate the production for the year 2008.

Year	2001	2002	2003	2004	2005	2006	2007
Production (quintals)	25	28	31	36	43	50	54

40. (a) A random sample of 50 batteries of brand A lasted on an average of 20 hrs with a variance of 4 hrs while a random sample of 70 batteries of brand B lasted on an average of 35 hrs with a variance of 9hrs. Test at α =1% whether brand B batteries are superior to brand A batteries.
(b) A die is thrown 120 times and each time the number of the upper most face is noted. The results are as follows.

Face of die	1	2	3	4	5	6
frequency	12	18	20	32	20	8

At 5% levels of significance test whether the die is unbiased.

SECTION-E
(Practical Oriented Questions)

V. Answer any TWO of the following questions. 2x5=10

41. Heights of 1000 soldiers are normally distributed with mean 165 cms and SD 6 cms. (i) Find the percentage of soldiers with height more than 160cms (ii) Find the number of soldiers with height between 160 cms and 170 cms.

42. A random sample of size 16 has mean 53. The sum of squared deviations taken from mean is 150. Can this sample be regarded as taken from the population having mean 56? [Use $\alpha = 0.01$]

43. To test the effectiveness of vaccination against tuberculosis, the following table was obtained.

	Attacked	**Not attacked**
Vaccinated	30	28
Not vaccinated	25	35

Test whether vaccination and attack of tuberculosis are independent.

44. For the following transportation problem find initial basic feasible solution by Least Cost method. Compute transportation cost. Is the solution degenerate?

		Destination			
		D_1	**D_2**	**D_3**	**a_i**
Origin	O_1	8	4	12	500
	O_2	10	5	6	200
	O_3	7	5	3	100
	b_j	400	200	200	800

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