



JAIN COLLEGE, v v puram

For Reduced Syllabus

Test / Exam:	Mock Paper 1	Month & Year:	2020-21
Class:	II PUC	Subject:	Statistics
Duration:	3:15 hrs.	Max. Marks:	100

- Note: 1. Statistical table 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. Define age specific fertility rate.
2. Mention a use of life table.
3. Define radix.
4. Write the formula for obtaining population between two census years.
5. State the condition required to satisfy circular test.
6. Is Marshall-Edge worth's index free from bias?
7. Write the formula for computing CPI by aggregative expenditure method.
8. Mention a factor causing seasonal variation.
9. Define cyclical variation.
10. If $p = \frac{4}{5}$, for a Bernoulli distribution write down the probability mass function.
11. In which distribution standard deviation and variance are equal?
12. In a normal distribution, given that $P(-0.8 < Z < 0.8) = 0.5762$.
Find $P(0 < Z < 0.8)$

Section – B

II. Answer any TEN of the following questions.

10 x 2 = 20

13. The population of the age group [15 - 19] in a city is 17000. The number of deaths in the age group is 170. Find the age specific death rate.
14. In a locality 3000 live births occurred. 24 mothers died due to child birth competitions. Compute MMR.

15. Calculate price index number for the following data by using simple aggregative method.

Commodity		Wheat per kg.	Rice per kg.	Pulses per kg.	Milk per kg.	Clothing per meter	Total
Price	2010	20	31	40	14	20	125
	2012	23	33	44	20	30	150

16. Why Fisher's index number is called an 'Ideal index number' ?
17. Given $Q_{01}^L = 92$ and $Q_{01}^{DB} = 96$ find Q_{01}^P
18. State two conditions of least squares method of measuring trend.
19. Define random variation . Give an example.
20. The mean and variance of a binomial distribution are 4 and 5 respectively . Comment on this statement with reason.
21. Given $a= 5$, $b= 3$ and $n=3$ find $P[x= 1]$ for hyper-geometric distribution.
22. Write the probability density function of a normal distribution with mean 10 and variance 3.
23. In a Poisson distribution the first probability term is 0.3679. Find the next probability term.
24. Write the mean and variance of a student's t-distribution.

Section - C

III. Answer any EIGHT of the following questions.

8 x 5 = 40

25. Find the total fertility rate for the following data.

Age (in years)	Female population	Number of live births
15-19	14000	840
20-24	15000	1350
25-29	14000	2660
30-34	12000	1200

26. Compute standardized death rates for town A and B. State which town is healthier?

Age (in years)	Death rates		Standard population
	Town A	Town B	
0-9	18	20	15000
10-29	10	9	35000
30-59	15	8	30000
60 & above	20	24	20000

27. What is a consumer price index number ? Write any four of its uses.

28. Calculate weighted geometric mean price index number.

Commodity		Wheat	Gram	Rice	Pulses
Price	Base year	50	60	20	50
	Current year	55	75	30	75
Weight		4	2	3	1

29. Calculate suitable index number from the following data. Comment on the result.

Item	Current year price	Quantity	
		Base year	Current year
A	30	8	10
B	45	10	15
C	100	7	10
D	22	20	25

30. Explain the moving averages method of measuring trend.

31. Calculate trend values by 4 yearly moving averages for the following data.

Year	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Profit (in crores)	80	85	82	90	100	95	85	84	98	100

32. Following data shows the population of India. Fit a curve of the type $Y = ab^x$ and estimate the population for the year 2021.

Year	1981	1991	2001	2011
Population (Crores)	43.9	54.8	68.4	84.4

33. The following table shows the expectation of life at different ages. Interpolate the expectation of life at the age 15.

Age (in years)	10	20	30	40
Expectation of life (in years)	50	42	33	22

34. Assuming that birth to male child and birth to female child to be equi-probable, find the probability that a family with three children has 2 or more male children.

35. 2% articles manufactured by a firm are defective. Articles are supplied in packets of 50 each.
- (i) What is the probability that a randomly selected packet is free of defective articles.
- (ii) Among 10000 packets how many are expected to be free of defective articles.
36. Monthly income of employees follows normal distribution with mean Rs.18000 and S.D. Rs.800 .Compute the probability of employees with monthly income
- (i) more than Rs. 20000 (ii) lies between Rs.16000 and Rs. 17000.

Section - D

IV. Answer any TWO of the following questions.

2 x 10 = 20

37. For the following data compute gross reproduction rate and net reproduction rate and comment.

Age (in year)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female population	16000	14500	13000	11500	10000	8700	7500
Female birth	480	812	650	460	300	87	30
Survival rate	0.91	0.90	0.89	0.88	0.87	0.86	0.85

38. Using the following data verify whether
- (i) Laspeyre's index number satisfies factor reversal test.
- (ii) Marshall-Edgeworth's price index number satisfies time reversal test.

Commodity		Rice	Wheat	Oil	Fish	Milk
Base year	Price (Rs.)	40	25	95	110	20
	Quantity	20	16	8	10	6
Current year	Price (Rs.)	45	30	95	120	30
	Quantity	22	15	9	10	7

39. Fit a straight line trend and also estimate production for the year 2009.

Year	2002	2003	2004	2005	2006	2007	2008
Production	12	10	14	11	13	15	16

40. The following are mistakes per page observed in a book. Fit a Poisson distribution and find expected frequencies.

Number of mistakes per page	0	1	2	3	4 and more
Number of pages	68	37	10	5	0

Section - E

V. Answer any TWO of the following questions.

2 X 5 = 10

41. For the following data compute crude birth rate and general fertility rate.

Age (in years)	0-14	15-19	20-24	25-29	30-39	40-49	50 & above
Male population	20730	7366	7300	6030	9980	7400	8400
Female population	19840	7310	7120	5860	9120	6910	7600
Live births	0	212	657	592	326	81	0

42. For the following data , calculate cost of living index number by family budget method.

	Group	Food	Clothing	Fuel	Entertainment	Medicine & Education	Others
Price (in Rs.)	Base year	130	50	90	30	40	50
	Current year	170	60	110	50	70	90
	Weight	30	12	8	15	10	15

43. Interpolate and extrapolate the production for the years 2013 and 2015 with the help of the following data

Year	2010	2011	2012	2013	2014	2015
Production	100	120	150	-	210	-

44. Five unbiased coins are tossed 256 times. Find the theoretical frequencies for the number of tails obtained.