



KLE Society's

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MODEL QUESTION PAPER -1

Class : II PU	Subject : STATISTICS	Subject Code : 31
Year :2020 – 21	Duration : 3 hour & 15 mins	Maximum Marks : 100

NOTE: 1. Statistical tables will be supplied on request.

2. Scientific Calculator is allowed.

3. All working steps should be clearly shown.

SECTION – A

I Answer any TEN of the Questions:

(10 x 1 = 10)

1. Define Vital Statistics.
2. What is “Longevity”?
3. Theoretically which is the best average for the construction of index numbers?
4. Which weights are used in the construction of Paasche’s price index number?
5. What is “Time series”?
6. What is Histogram?
7. Give an examples for seasonal variation.
8. Mention one assumptions of interpolation and extrapolation.
9. Write the relation between mean and variance of Binomial distribution.
10. Which type of skewness Poisson distribution has?
11. If Z is a SNV, then name the distribution of Z^2 .
12. Write down the area under the normal curve in 3σ neighborhood of μ .

SECTION – B

II Answer any TEN the Questions:

(10 x 2 = 20)

13. In a village 2400 live births occurred in a year. The number of infant deaths was 60. Calculate infant mortality rate.
14. Mention any two uses of life table.
15. Find P_t , given $P_0=1,26,000$, $B=24,200$, $D=4,000$, $I=8,050$ & $E=6,020$
16. Write any two considerations for the selection of base year in the construction of an index number.
17. If $\sum p_0q_0=250$, $\sum p_1q_1=310$, $\sum p_1q_0=210$ and $\sum p_0q_1=250$, find p_{01} (DB).
18. Why Fisher’s index number is called as **ideal**?
19. Mention the normal equations which are used in fitting of second degree equation.
20. Define ‘Interpolation’ and ‘Extrapolation’.
21. Mention the different methods of interpolation.
22. If $q=0.4$ for a Bernoulli distribution, find mean and variance of the distribution.
23. Mean of a Binomial distribution is 6 and standard deviation is $\sqrt{2}$. Find the parameters.
24. If the parameter of t-distribution is 6, then find its variance.

SECTION – C

III Answer any EIGHT of the following questions:

(8 x 5 = 40)

25. For the following data compute:

- i) General Fertility Rate
- ii) ASFRs for the age groups 15-19 years and 25- 39 years.

Age group (in years)	Female population	No. of live Births
15-19	12,000	400
20-24	12,700	650
25-29	9,400	510
30-39	9,000	300
40-49	6,000	95

26. Calculate net reproduction rate from the data given below.

Age group	Female population	Female births	Survival rates
15-19	3,000	50	0.9
20-24	2,500	400	0.9
25-29	2,200	300	0.8
30-34	2,000	100	0.8
35-39	1,800	60	0.8
40-44	1,500	30	0.8
45-49	1,200	10	0.7

27. Calculate 'Simple geometric mean price index number' for following data:

Items	A	B	C	D	E
Prices in 2014 (in Rs.)	25	40	150	5	32
Prices in 2015 (in Rs.)	30	45	144	12	40

28. Explain the steps involved in the construction of 'Consumer price index number'.

29. Compute four yearly moving averages for the following data.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Value	22	35	49	64	80	97	115	110	92	95

30. Compute five yearly moving averages for the following data.

Year	2009	2010	2011	2012	2013	2014	2015
Production(in lakh)	20	35	42	55	63	77	90

31. Find the value of y when x= 09 using suitable interpolation formula.

X	4	6	8	10	12
Y	23	34	109	311	706

32. 'Interpolate' and 'Extrapolate' the sales for the years 2013 and 2016 for the following data.

Year	2011	2012	2013	2014	2015	2016
Sales (in '000s)	10	18	–	40	54	–

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

34. The probability of an article manufactured by a firm found to be defective is 0.01. Find the probability that a box containing 100 articles have no defectives among 500 such boxes how many contain defective articles?

35. A pond has 12 fish among which 5 are marked ones. 4 fishes are caught from the pond. Find the probability that three of them are marked. Also find the mean of marked fishes.

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

SECTION – D

IV Answer any TWO of the following questions:

(2 x 10 = 20)

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

Age group	Female population	Female Births	Survival Rates
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

- i) Laspeyres's and Marshall Edge worth quantity index number.
- ii) Show that Fisher's price index number satisfies Factor Reversal Test (FRT)

Items	2012		2013	
	Price (Rs.)	Quantity	Price (Rs.)	Quantity
A	30	20	42	25
B	150	40	150	35
C	25	15	22	20
D	66	30	70	35

39. Fit an Exponential trend line and estimate the value for 2008.

Year	2000	2001	2002	2003	2004	2005	2006
Value	4	6	10	18	22	25	30

40. (a).Mention the properties of Normal distribution.

(b). Seventy accidents that have occurred in a state in a week are tabulated as follows:

Day	Sun	Mon	Tue	Wed	Thu	Fri	Sat
Accidents	7	8	11	12	5	13	14

Test whether accidents occur uniformly throughout the week.

SECTION – E

V Answer any TWO of the following questions:

(2 x 5 = 10)

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

Group	Price(in Rs)		Weight
	2005	2010	
Food	3,000	3,600	10
Housing	4,000	5,000	12
Clothing	2,000	1,600	05
Fuel	1,000	1,400	15
Miscellaneous	1,200	1,500	05

42. The following table gives the profits of concern for 5 years ending 2009.

Year	2005	2006	2007	2008	2009
Profit(in lakhs)	1.4	4.5	13.8	40.2	125

Fit an equation of the form type $y = ab^x$.

43. If x is a normal variate with parameter $\mu=50$ and $\sigma^2=16$. Find

- i) $P(x < 45)$ and ii) $P(45 < x < 55)$

44. Heights of PU students is normally distributed with mean 155cm. and standard deviation 5cm. find the

- i) Probability that a randomly selected PU students has height more than 155cm.
- ii) Percentage of PU students having height between 150cm and 160cm.