SAIVA BHANU KSHATRIYA COLLEGE

(Aruppukottai Nadargal Uravinmurai Pothu Abi Viruthi Trustuku Pathiyapattathu)

ARUPPUKOTTAI

DEPARTMENT OF MATHEMATICS

QUESTION BANK

Class :	B.Sc., Mathematics		
Semester (UG - III & V; PG - III) :	III	Subject Code :	SMTJA31
Name of the Subject :	Mathematics III		

Section A(Multiple Choice Questions)

Unit –I :

1. The r^{th} moment about any point A μ_r' is _____
   a) $\frac{\sum f_i(x_i-A)^r}{N}$ b) $\frac{\sum f_i(x_i-A)}{N}$ c) $\frac{\sum f_i(x_i-A)^2}{N}$
2. The first moment about origin $\mu_1 =$
   a) 0 b)1 c) $\frac{\sum f_i(x_i-A)}{N}$
3. The formula for Karl-Pearson Coefficient of Skewness is
   a) $\frac{Mean-Mode}{\sigma}$ b) $\frac{Mean-Median}{\sigma}$ c) $\frac{Mean+Mode}{\sigma}$
4. For a curve which is flatter than the normal curve, $\beta_2 < 3$, then the curve is known as
   a) Messokurtic b)Platykurtic c) Leptokurtic
5. $\beta_1 =$
   a) μ_3^2/μ_2^3 b) μ_2^3/μ_3^2 c) μ_3^3/μ_2^2

Unit-II :

6. Regression Coefficient $b_{xy} = \gamma.$___
   a) σ_x/σ_y b) σ_y/σ_x c)σ_x
7. The Correlation Coefficient γ lies between
   a) -1 and 1 b) 0 and 1 c) -1 and 0
8. The variables are uncorrelated, then $\gamma =$
   a) 1 b) 0 c) -1
9. If two variables are uncorrelated, the the lines of regression are ____ to each other.
   a) Parallel b) Perpendicular c) Coincide
10. $b_{xy}.b_{yx} =$
    a) γ b) $-\gamma$ c) γ^2

Unit-III :

11. E =

a) $1+\Delta$ b) $1-\Delta$ c) $1+\nabla$

12. $E^{-1} =$

a) $1+\Delta$ b) $1-\Delta$ c) $1-\nabla$

13. The n^{th} order difference of a polynomial of degree n is ____

a) constant b)zero c) 1

14. $\Delta^n(x^n) =$

a) n b) $n!$ c) 0

15. Newton Interpolation formula is used only when the interval of difference is ___

a) equal b) unequal c) same

Unit –IV:

16. For n attributes, total positive class frequencies =____

a) 3^n b) 2^n c) 3^n-1

17. For n attributes, total negative class frequencies =____

a) 3^n b) 2^n-1 c) 3^n-1

18. (ABC)+(ABγ)=

a) (AB) b)(BC) c) (Cγ)

19.If there are two attributes A and B , $(A)+(\alpha)$ =

a) N b) (A) c) (α)

20. $(\alpha), (\alpha\beta), (\alpha\beta\gamma)$, ... are _____ frequencies.

a) Postive class b) Negative class c)class

Unit-V:

21. Aggregate expenditure method index number = _____ × 100

a) $\frac{\sum p_1q_0}{\sum p_0q_0}$ b) $\frac{\sum p_1q_1}{\sum p_0q_0}$ c) $\frac{\sum p_0q_0}{\sum p_1q_0}$ d) $\frac{\sum p_1q_0}{\sum p_0q_1}$

22. In Family Budget Index number P = _____× 100

a) $\frac{p_1}{p_0}$ b) $\frac{p_0}{p_1}$ c) $\frac{q_1}{q_0}$ d) $\frac{q_0}{q_1}$

23.Which of the following is an ideal index number

a) Laspeyre b) Paasche's c) Fisher's

24. Geometric mean of Laspeyre's and Paasche's index number is ___

a) Fisher's b) Kelley's c) Bowley's

25.The Arithmetic mean of Laspeyre's and Paasche's index number is ___

a) Fisher's b) Kelley's c) Bowley's

Section -B (7 Mark Questions)

Unit -I

26.Calculate μ_1 *and* μ_2 from the following data.

X	0	1	2	3	4	5
F	5	15	17	25	19	14

27.The first 4 moments of a distribution about x=2 are 1,2.5,5.5 and 16. Calculate the 4 moments about the mean

28.The first 3 moments about the origin are given by $\mu_1' = \frac{1}{2}(n+1)$; $\mu_2' = \frac{1}{6}(n+1)(2n+1; \mu 3' = 14nn+12;$ examine the skewness of distribution.

29.For a frequency distribution, show that $\beta_2 \geq 1$.

30. Calculate the Karl pearson's coefficient of skewness.

Wages	10	11	12	13	14	15
Frequency	2	4	10	8	5	1

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Unit -II

31.If x, y and z are uncorrelated variables each having same standard deviation obtain the coefficient of correlation between x+y and y+z.

32. Find the correlation coefficient for the following data

X	10	12	18	24	23	27
Y	13	18	12	25	30	10

33.From the following data of marks obtained by 10 students in Physics and Chemistry calculate rank correlation coefficient.

Physics	35	56	50	65	44	38	44	50	1`5	26
Chemistry	50	35	70	25	35	58	75	60	55	35

34.Prove that $-1 \leq \gamma \leq 1$

35.The two variables x and y have the regression lines 3x+2y-26=0 and 6x+y-31-0. Find

(i) Mean values of x and y

(ii)The correlation coefficient between x and y

(iii)The variance of y if the variance of x is 25.

Unit -III

36.Find $\Delta^n \sin x$ taking h=1.

37.Give an estimate of the population in 1971 from the following data

Year	**1941**	**1951**	**1961**	**1971**	**1981**	**1991**
Population in lakhs	**363**	**391**	**421**	**?**	**467**	**501**

38.Given that $U_0 + U_8 = 80; U_1 + U_7 = 10; U_2 + U_6 = 5; U_3 + U_5 = 10; Find\ U_4$

39.If $U_{75} = 246; U_{80} = 202; U_{85} = 118 and\ U_{90} = 40. Find\ U_{79}$

40.Find $U_5\ given\ that\ U_1 = 4; U_2 = 7; U_4 = 13; and\ U_7 = 30.$

Unit-IV

41.Given the following ultimate class frequencies of two attributes A and B. Find the frequencies of positive and negative class frequencies. (AB)=975;$(\propto B) = 100; (A\beta) = 25; (\propto \beta) = 950$

42.In a class test in which 135 candidates were examined for proficiency in English and Maths. It was discovered that 75 students failed in English, 90 failed in Maths and 50 failed in both. Find how many candidates (i) have passed in Maths (ii)Have passed in English (iii) have passed in English, failed in Maths (iv)have passed in maths

43.Of 500 men in locality exposed to cholera 172 in all were attacked;178 were inoculated and of these 128 were attacked. Find the number of persons (i) not inoculated not attacked(ii)inoculated and attacked (iii) not inoculated attacked.

44.Find the limits of (BC) for the following available data: N=125;(A)=48;(B)=62;(C)=45;$(A\beta) = 7\ (A\gamma) = 18.$

45.Find the greatest and least values of (ABC). (A)=50;(B)=60;(C)=80;(AB)=35;(AC)=45 and (BC)=42.

Unit -V

46.From the following data of the whole sale price of Rice for the 5 years construct the index numbers taking (i) 1987 as base (ii) 1990 as base.

Year	1987	1988	1989	1990	1991	1992
Price	5	6	6.5	7	7.5	8

47.Prove that Fisher's Index number is an ideal index number.

48.From the fixed base index number, prepare a chain base index number

Year	1975	1976	1977	1978	1979	1980
Fixed base	90	105	102	98	120	125

49. From the chain base index number, prepare a fixed base index number

Year	1985	1986	1987	1988	1989	1990
Chain base	105	108	110	107	115	120

50.Find the cost of living index for the following data

Items	Price in 1991	Price in 1992	Weight
Food	700	850	40
Clothing	300	280	15
Rent	200	225	7
Fuel	70	82	5
Medicine	100	135	9
Education	500	550	12
Entertainment	100	90	10
Misc	475	425	23

Section -C (10 Mark Questions)

Unit -I

51.Calculate the first 4 central moments and find $\beta_1 and\ \beta_2$.

X	0	1	2	3	4	5	6

F	5	15	17	25	19	14	5

52.Calculate Karl Pearson Coefficient Of Skewness

Size	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

Unit-II

53. Ten students obtained the following percentage of marks in the college internal test and university examination. Find γ.

54.Three judges assign the ranks to 8 entries in a beauty contest.

Judge X	1	2	4	3	7	6	5	8
Judge Y	3	2	1	5	4	7	6	8
Judge Z	1	2	3	4	5	7	8	6

Which pair of judges has the nearest approach to common taste in beauty?

Unit-III

55. Find the missing terms in the following table

X	0	5	10	15	20	25
U	7	11	?	18	?	32

56.Find the function U(x) for the following data Hence find U(3)

X	0	1	2	5
U(x)	2	3	12	147

Unit-IV

57.Given the following positive class frequencies. Find the remaining frequencies N=20;(A)=9;(B)=12;(C)=8;(AB)=6;(BC)=4;(CA)=4;(ABC)=3.

58.Given N=1200;(ABC)=600;$(\alpha\beta\gamma) = 50; (\gamma) = 270; (A\beta) = 36; (B\gamma) = 204; (A) - (\alpha) = 192; (B) - (\beta) = 620$; Find the remaining ultimate class frequencies.

59.Calculate (i) Laspeyre's (ii)Paasches (iii)Marshall-Edgeworth (iv)Bowleys (v) Fisher's Index number for the following data

Commodities	Base Year 1990		Current year 1992	
	Price	Quantity	Price	Quantity
A	2	10	3	12
B	5	16	6.5	11
C	3.5	18	4	16
D	7	21	9	25
E	3	11	3.5	20

60.Find the missing price in the following data if the ratio between Laspeyre's and Paasche's index number is 25:24

Commodities	Base Year		Current year	
	Price	Quantity	Price	Quantity
A	1	15	2	15
B	2	15	?	30