2019

STATISTICS

Full Marks : 100

Pass Marks : 33

Time : Three hours

Attempt all Questions.

The figures in the right margin indicate full marks for the questions.

From Question Nos. 1 to 6, choose the correct answer and rewrite.

1. The Probability of an impossible event is 1

   A. 0

   B. 1

   C. –1

   D. Both 1 and –1.

2. If the 4^{th} order difference of $f(x)$ is constant, then the degree of the polynomial $f(x)$ is 1

   A. 3

   B. 4

   C. 2

   D. 5.

3. Equality of mean and variance of a distribution is an indication of the distribution being 1

   A. binomial

   B. poisson

   C. normal

   D. non of the above.

4. The total number of class frequencies of all orders for a n attributes is 1

A. 2^n

B. 2^{n-1}

C. 3^n

D. 3^{n-1}.

5. In the test statistic , $F=\frac{S_1^2}{S_2^2}$ $\left(\text{where } S_1^2>S_2^2\right)$, the degrees of freedom of the test-statistic is 1

A. (n_1, n_2)

B. (n_2, n_1)

C. $(n_1-1,\ n_2-1)$

D. $(n_2-1,\ n_1-1)$.

6. In the theory, Gross Reproduction Rate (GRR) ranges from 1

A. 0 to 2

B. 0 to 3

C. 0 to 4

D. 0 to 5.

7. In an experiment two unbiased coins are thrown simultaneously. Then how many sample points are there in the Sample Space of the experiment? 1

8. Define the mathematical expectation of a discrete random variable. 1

9. A, B and C are any three joint events and they are the subsets of the Sample Space S.

Draw the Venn-diagram of AUBUC. 1

10. What is the advantages of Lagrange's interpolation formula over Newton's forward interpolation formula? 1

11. What will be the minimum value of the argument for the application of Simpson's $\frac{1}{3}$rd rule? 1

12. Write the probability mass function of binomial distribution. 1

13. When does the value of the ordinate maximum in a normal probability curve ? 1

14. Define level of significance. 1

15. Define stable population used in vital statistics. 1

16. Sex ratio is defined as the ratio of total number of females to the total number of males in the population.

Is the above definition true ? If not, write the correct definition. 1

17. Define 3

(i) Simple event and

(ii) Compound event.

18. In a random throw of n dice, what is the expectation of the product of points on them ? 3

19. Establish the relation between Δ and E operators. 3

20. Evaluate $\int_1^5 2x\,dx$ by using Trapezoidal's rule. 3

21. Comment on the following :

The mean and the variance of a binomial distribution are 4 and 6. 3

22. Define students' t- statistic. Write any two assumptions for the application of student's t- statistic. 1+2=3

23. A Card is drawn from a well-shuffled pack of 52 cards. What is the probability that it is either a king or a queen? 4

24. Given $f(0) = 3,\ f(1) = 12,\ f(2) = 81,\ f(3) = 200,\ f(4) = 100,\ f(5) = 8$, find $\Delta^5 f(0)$. 4

25. The mean and the variance of a binomial distribution are 4 and $\frac{4}{3}$ respectively.

Find $P(X = 3)$. 4

26. Define Yule's Coefficient of association. Write the value of the coefficient for

(i) Completely associated attributes and

(ii) Completely disassociated attributes. 4

27. Give inference from the given data whether the attributes A and B are independent, positively associated or negatively associated:

$N = 1000,\ (A) = 435,\ (B) = 600,\ (A\beta) = 155.$ 4

28. Draw the probability curve of Chi-Square distribution for degrees of freedom:

1, 2, 3, 4. 4

29. Stae and prove the multiplicative law of probability. 6

30. State and prove Newton's forward interpolation formula. 6

31. Establish the Simpsons $\frac{3}{8}$th rule of numerical integration from the general quadrature formula. 6

32. Define an attribute. If there are two attributes A and B, write down all possible classes of 'zero', 'first' and 'second' order and indicate the positive and negative classes. 6

33. Ten individuals choosen at random have the following weights in Kgs:

63, 65, 66, 67, 69, 68, 71, 71, 70, 70.

In suggestion that the mean weight the suggestion that the mean weight in the universe is 65 Kgs.

$\left[\text{Given,} \quad {}_{0\cdot05}t \text{ for } 9\ d.f. = 2\cdot262\right]$

$\sqrt{66} = 8\cdot12, \qquad \sqrt{10} = 3\cdot16,$ 6

34. Write the meaning of the Symbols *lx*, *dx*, *Lx*, *Px*, *qx* and *Tx* as used in a life-table. 6

35. From the following data of two towns A and B which town would you consider to be more healthy ? (Assume town B as Standard) 6

	Town A		Town B	
Age	**Population**	**Death**	**Population**	**Death**
0 – 15	10,000	200	15,000	375
15 – 50	18,000	504	20,000	600
50 – above	2,000	50	5,000	100