

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 4th 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, $F = \frac{S_1^2}{S_2^2}$ (where $S_1^2 > S_2^2$), 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. State 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 chosen 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.
[Given, $t_{0.05}$ for 9 d.f. = 2.262]
 $\sqrt{66} = 8.12, \sqrt{10} = 3.16,$ 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