

INSTRUCTIONS TO CANDIDATES

1. Please do not open this Booklet till you are said to do so.
2. **Duration of Test – 2 Hours**
3. Before commencement of the exam, please fill up necessary information in the space provided below and also in the answer sheet.
4. Use HB Pencil only to darken the circle for answer in the question.
5. For each correct answer, one mark will be awarded. For each wrong answer $\frac{1}{4}^{th}$ of the earmarked for each question will be deducted. If more than one circle is darkened for a question, it will be treated as wrong answer for questions not answered i.e., blanks, a zero will be given
6. Rough Work, if any must be done on the pages, specified as SPACE FOR ROUGH WORK only and nowhere else in the question paper booklet or in the answer sheet.

Marking the Answers
Example: For Question No. 12, if the candidate Considers, the correct answer to be C, he is to mark as shown below (Correct Method) 12. <input type="radio"/> A <input type="radio"/> B <input checked="" type="radio"/> C <input type="radio"/> D

Paper											
Topics (Maximum Marks-50)											
1.Relations & Function 2.Theoretical Distribution 3.Index Number 4.Statistical Description of Data											
To be Filled by Students											
Name of Candidate											
Roll No. (Mobile No)	<table border="1"><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>										
Question Paper Booklet Code	DSS										

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Space for Rough Work

1. The range of the function F defined by $f(x) = \sqrt{16 - x^2}$ is
(a) $[-4, 0]$ (b) $[-4, 4]$
(c) $[0, 4]$ (d) $[+4, 4]$
2. The domain of the function $f(x) = \frac{x^2+3x+5}{x^2-5x+4}$ is:
(a) \mathbb{R} (b) $\mathbb{R} - \{1, 4\}$
(c) $\mathbb{R} - \{1\}$ (d) $(1, 4)$
3. If \mathbb{N} be the set of all natural numbers and \mathbb{E} be the set of all even natural numbers then the function $f: \mathbb{N} \rightarrow \mathbb{E}$, such that $f(x) = 2x$ for all $x \in \mathbb{N}$ is
(a) one-one onto (b) one-one into
(c) many-one onto (d) constant
4. If $A = \{a, b, c, d\}$; $B = \{p, q, r, s\}$ which of the following relation is a function from A to B
(a) $R_1 = \{(a, p), (b, q), (c, s)\}$ (b) $R_2 = \{(p, a), (b, r), (d, s)\}$
(c) $R_3 = \{(b, p), (c, s), (b, r)\}$ (d) $R_4 = \{(a, p), (b, r), (c, q), (d, s)\}$
5. Let \mathbb{R} is the set of real numbers such that the function $f: \mathbb{R} \rightarrow \mathbb{R}$ and $g: \mathbb{R} \rightarrow \mathbb{R}$ are defined by $f(x) = x^2 + 3x + 1$ and $g(x) = 2x - 3$. Find $(f \circ g)$:
(a) $4x^2 + 6x + 1$ (b) $x^2 + 6x + 1$
(c) $4x^2 - 6x + 1$ (d) $x^2 - 6x + 1$
6. If $f(x) = \frac{x+1}{x+2}$, then $f\left\{f\left(\frac{1}{x}\right)\right\} =$ _____
(a) $\frac{2x+3}{3x+5}$ (b) $\frac{2x+5}{3x+2}$
(c) $\frac{3x+2}{5x+3}$ (d) $\frac{5x+2}{2x+3}$
7. Let $F: \mathbb{R} \rightarrow \mathbb{R}$ be defined by
$$f(x) = \begin{cases} 2x & \text{for } x > 3 \\ x^2 & \text{for } 1 < x \leq 3 \\ 3x & \text{for } x \leq 1 \end{cases}$$

The value of $f(-1) + f(2) + f(4)$ is
(a) 9 (b) 14
(c) 5 (d) 6
8. $A = \{1, 2, 3, 4, \dots, 10\}$ a relation on A ,
 $R = \{(x, y) \mid x + y = 10, x \in A, y \in A, x \geq y\}$ then domain of R^{-1} is
(a) $\{1, 2, 3, 4, 5\}$ (b) $\{0, 3, 5, 7, 9\}$
(c) $\{1, 2, 4, 5, 6, 7\}$ (d) None

9. Let $A = \{1,2,3\}$ and consider the relation $R = \{(1,1), (2,2), (3,3), (1,2), (2,3), (1,3)\}$. Then R is:
(a) Symmetric and transitive
(b) Reflexive but not transitive
(c) Reflexive but not symmetric
(d) Neither symmetric, nor transitive
10. If $f(x) = x^2 - 1$ and $g(x) = \frac{x+1}{2}$, then $\frac{f(3)}{f(3)+g(3)}$ is
(a) $5/4$
(b) $4/5$
(c) $3/5$
(d) $5/3$
11. Standard deviation of binomial distribution is:
(a) \sqrt{np}
(b) $(np)^2$
(c) \sqrt{npq}
(d) $(npq)^2$
12. In a discrete random variable X follows uniform distribution and assumes only the values 8,9,11,15,18,20. Then $P(X \leq 15)$ is ____
(a) $\frac{1}{2}$
(b) $\frac{1}{3}$
(c) $\frac{2}{3}$
(d) $\frac{2}{5}$
13. In a normal distribution about 95 per cent of the observations lie between ____ and _____.
(a) $\mu - 2\sigma, \mu + 2\sigma$
(b) $\mu - 3\sigma, \mu + 3\sigma$
(c) $\mu - 1.96\sigma, \mu + 1.96\sigma$
(d) $\mu - 2.58\sigma, \mu + 2.58\sigma$
14. The variance of a binomial distribution with parameters n and p is:
(a) $np^2(1-p)$
(b) $\sqrt{np - (1-p)}$
(c) $nq(1-q)$
(d) $n^2p^2(1-P)^2$
15. If p is increased for a fixed n ; the Binomial distribution shifts to the
(a) Right
(b) left
(c) Above
(d) Below
16. X is a Poisson variate satisfying the following condition
 $9P(X=4) + 90P(X=6) = P(X=2)$. What is the value of $P(X \leq 1)$?
(a) 0.5655
(b) 0.6559
(c) 0.7358
(d) 0.8201

17. What is the first quartile of x having the following probability density function?
 $f(x) = \frac{1}{\sqrt{72\pi}} e^{-(x-10)^2/72}$ for $-\infty < x < \infty$
(a) 4 (b) 5
(c) 5.95 (d) 6.75
18. In a binomial distribution $B(n, p)$ $n = 4$ $P(x = 2) = 3P(x = 3)$ find P
(a) $1/3$ (b) $2/3$
(c) $6/4$ (d) $4/3$
19. The quartile deviation of a normal distribution with mean 10 and standard deviation 4 is _____.
(a) 54.24 (b) 23.20
(c) 0.275 (d) 2.70
20. It is Poisson variate such that $P(x = 1) = 0.7$, $P(x = 2) = 0.3$, then $P(x = 0) =$
(a) $e^{6/7}$ (b) $e^{-6/7}$
(c) $e^{-2/3}$ (d) $e^{-1/3}$
21. If x is a binomial variate with $P = 1/3$, for the experiment of 90 trials, then the standard deviation is equal to:
(a) $-\sqrt{5}$ (b) $\sqrt{5}$
(c) $2\sqrt{5}$ (d) $\sqrt{15}$
22. Let X be normal distribution with mean 2.5 and variance 1. If $P[a < X < 2.5] = 0.4772$ and that the cumulative normal probability value at 2 is 0.9772, then $a = ?$
(a) 0.5 (b) 3
(c) -3.5 (d) -4.5
23. The manufacturer of a certain electronic component is certain that 2% of his product is defective. He sells the components in boxes of 120 and guarantees that not more than 2% in any box will be defective. Find the probability that a box, selected at random would fail to meet the guarantee? (Given that $e^{-2.4} = 0.0907$)
(a) 0.49 (b) 0.39
(c) 0.37 (d) 0.43
24. If Standard Deviation is 1.732 then what is the value of Poisson distribution. The $P[-2.48 < x < 3.54]$ is
(a) 0.73 (b) 0.65
(c) 0.86 (d) 0.81

25. The incidence of skin diseases in a chemical plant occurs in such a way that its workers have 20% chance of suffering from it. What is the probability that 6 workers 4 or more will have skin diseases?
- (a) 0.1696 (b) 0.01696
(c) 0.1643 (d) 0.01643
26. In the year 2010 the monthly salary of a clerk was Rs. 24,000. The consumer price Index was 140 in the year 2010, which rises to 224 in the year 2016. If he has to be rightly compensated, what additional monthly salary should be paid to him?
- (a) Rs. 14,400 (b) Rs. 38,400
(c) Rs. 7,200 (d) None of these
27. Consumer price index number for the year 1977, was 313, with 1960 as the base year, and was 100 for the year 1960. The average monthly wages in 1977 of the workers into factory be Rs. 160, their real wages is:
- (a) Rs. 48.40 (b) Rs. 51.12
(c) Rs. 40.30 (d) None of these
28. The monthly income of an employee was Rs. 8,000 in 2014. The consumer price index number was 160 in 2014, which rose to 200 in 2017. If he has to be rightly compensated, the additional dearness allowance to be paid to him in 2017 would be:
- (a) Rs. 2,400 (b) Rs. 2,750
(c) Rs. 2,500 (d) None
29. The number of tests of Adequacy is:
- (a) 2 (b) 5
(c) 3 (d) 4
30. If Laspeyres's Index Number is 250 and Pache's Index Number is 160, then Fisher's Index Number is
- (a) 40,000 (b) $\frac{25}{16}$
(c) 200 (d) $\frac{16}{25}$
31. If $\sum P_0 Q_0 = 1360$, $\sum P_n Q_0 = 1900$, $\sum P_0 Q_n = 1344$, $\sum P_n Q_n = 1880$ then the Laspeyres's. Index number is
- (a) 0.71 (b) 1.39
(c) 1.75 (d) None

32. The prices and quantities of 3 commodities in base and current years are as follows:

p_0	p_1	q_0	q_1
12	14	10	20
10	8	20	30
8	10	30	10

The Laspeyres price index is

- (a) 118.13 (b) 107.14
(c) 120.10 (d) None
33. The cost-of-living index numbers in years 2015 and 2018 were 97.5 and 115 respectively. The salary of a worker in 2015 was Rs. 19500. How much additional salary was required for him in 2018 to maintain the same standard of living as in 2015?
(a) 3000 (b) 4000
(c) 3500 (d) 4500
34. In Laspeyres's index number is 110 and Fisher's ideal index number is 109. Then Paasche's index number is
(a) 118 (b) 110
(c) 109 (d) 108
35. When the prices for quantities consumed of all commodities are changing in the same ratio, then the index numbers due to Laspeyres's and Paasche's will be.
(a) Equal
(b) Unequal
(c) Reciprocal of Marshall Edge worth Index Number
(d) Reciprocal of Fisher Index Number
36. Purchasing Power of money is
(a) Reciprocal of price index number.
(b) Equal to price index number.
(c) Unequal to price index number.
(d) None of these
37. The three index numbers, namely, Laspeyres, Paasche and Fisher do not satisfy _____ test.
(a) Time reversal (b) Factor reversal
(c) Unit (d) Circular
38. Laspeyres and Paasche do not satisfy
(a) Unit Test (b) Factor Test
(c) Time Reversal Test (d) Bowley's Test

39. For year 2015, price index was 267% with base year 2005. The percentage increase in price index over base year 2005 is:
(a) 267% (b) 67%
(c) 167% (d) none of these
40. Which of the following index is computed taking the average of base year and current year?
(a) Marshall- Edgeworth's index
(b) Paasche's index
(c) Laspeyres Index
(d) Fisher's index
41. Curve obtained by joining the points whose x coordinates are the upper limits of the class intervals and y coordinates are the corresponding cumulative frequencies is called.
(a) Frequency Polygon (b) Frequency curve
(c) Histogram (d) Ogive
42. Data collected on religion from the census reports are:
(a) Primary data (b) Secondary data
(c) Sample data (d) (a) or (b)
43. A suitable graph for representing the portioning of total into sub parts in statistics is:
(a) A Pie charts (b) A pictograph
(c) An ogive (d) Histogram
44. The average of salaries in a factory is ₹ 47,000. The Statement that the average salary ₹ 47,000 is _____.
(a) Descriptive statics (b) Inferential
(c) Detailed (d) Undetailed
45. Sweetness of a sweet dish is:
(a) Attribute (b) Discrete variable
(c) Continuous variable (d) Variable
46. _____ Series is continuous.
(a) Open ended (b) Exclusive
(c) Close ended (d) Unequal call intervals
47. You are an auditor of a firm and the firm earns a profit of ₹ 67,000 you stated to them that the annual profit is ₹ 67,000. This is _____ type of statistics.
(a) Descriptive (b) Detailed
(c) Non detailed (d) Inferential

48. When data are classified according to one criterion, then it is called _____ classification.
- (a) quantitative (b) qualitative
(c) simple (d) factored
49. The _____ are used usually when we want to examine the relationship between two variables.
- (a) Bar Graph (b) Pie Chart
(c) Line Chart (d) Scatter Plot
50. A variable with qualitative characteristic is known as
- (a) Quality Variable (b) An attribute
(c) A discrete variable (d) A continuous variable

All the Best!!

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