2021

Full Marks : 70

Time : 3 hours

The figures in the right-hand margin indicate marks

Answer **all** Parts as directed

Part—A

(Objective Type Questions)

1. *(a)* Fill in the blanks with a correct answer from the given alternatives : 5×1

(i) One can also get ——— with the help of ogive.

(1) mode

(2) median

(3) quartiles

(4) Both *(2)* and *(3)*

(ii) The ——— of the first n natural numbers is $\frac{n+1}{2}$.

(1) geometric mean

(2) mode

(3) median

(4) arithmetic mean

(iii) The median is equal to ——— in case of symmetrical distribution.

(1) $\frac{Q_1 - Q_3}{2}$

(2) $\frac{Q_3 - Q_1}{2}$

(3) $\frac{Q_1 + Q_3}{2}$

(4) $\frac{Q_1 Q_3}{2}$

(iv) The two events A and B are independent when ———.

(1) $P(A \cap B) = P(A)P(B|A)$

(2) $P(A \cap B) = P(B)P(A|B)$

(3) $P(A \cap B) = P(A) \cdot P(B)$

(4) None of these

(v) In Poisson distribution ———.

(1) mean > variance

(2) mean < variance

(3) mean = variance

(4) All of these

(b) Four alternative answers for each question are given. Point out the correct one : 5×1

(i) The frequency distribution

x	0	1	2	3	4
f	2	22	222	22	2

(1) Discrete frequency distribution

(2) Continuous frequency distribution

(3) Skewed frequency distribution

(4) None of these

(ii) There are two series of observations

A	20	30	40	50	60
B	5	6	7	8	9

(1) The series A is more consistent

(2) The series B is more consistent

(3) The series A and the series B are equally consistent

(4) None of these

(iii) In a positively skewed distribution

(1) mean < median < mode

(2) mode < median < mean

(3) mode > median > mean

(4) None of these

(iv) In binomial distribution

(1) mean = variance

(2) mean > variance

(3) mean < variance

(4) None of these

(v) In case of normal distribution

(1) $\beta_1 = 0, \beta_2 = 3$

(2) $\beta_1 > 0, \beta_2 = 3$

(3) $\beta_1 = 0, \beta_2 > 3$

(4) None of these

Part—B

(Short Answer Type Questions)

Answer *any four* of the following : 4×5

2. Explain histogram and ogive.

3. Define central tendency of the data. Give one example.

4. What do you mean by skewness? State its measures.

5. What is scatter diagram? With the help of the scatter diagram, explain linear regression and curvilinear regression.

6. What is probability? Show that the probability of an event lies between 0 and 1.

7. Show that if two events A and B are independent, then A' and B' are also independent.

Part—C

(Long Answer Type Questions)

Answer *any four* of the following : 4×10

8. Explain the measures of central tendency of the data.

9. Calculate mean deviation and standard deviation of the following :

x	0	1	2	3	4
f	2	22	222	22	2

10. Calculate total correlation coefficient between x and y :

x	50	60	70	80	90
y	2	3	4	5	6

11. Show that the probability of happening of the event A or the event B or both the events is given by

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Write expression for $P(A \cup B \cup C)$.

12. What is mathematical expectation? Show that $E(x \cdot y) = E(x)\,E(y)$.

13. Obtain the limiting case of binomial distribution.

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