Previous Year (2018) Question Paper of Computer Oriented Statistical Method

6215 SAMPLE 440031

Total No. of Questions : 10] [Total No. of Printed Pages : 7

(1107)

B.C.A. UG (CBCS) RUSA Vth Semester Examination

3850

COMPUTER ORIENTED STATISTICAL METHODS

BCA–505

Time : 3 Hours] **[Maximum Marks : 70**

Note :– Part–A (both questions 1 and 2) is compulsory. Attempt *four* questions from Parts B, C, D and E by selecting *one* question from each Part. Marks are indicated along the questions.

Part–A

Compulsory Question

1. Do as directed in the following questions. Choose the appropriate answer.

   (i) The arithmetic mean of Ist 10 natural numbers is 55. (True/False)

(ii) For usual meanings, the formula $\bar{x} = \frac{1}{N}\Sigma fx$ stands for :

(a) Mean (b) Median

(c) Harmonic mean (d) Geometric mean

(iii) The coefficients of dispersion (C.D.) based on standard deviation is C.D. = $\frac{\text{S.D.}}{\text{Mean}}$.

(True/False)

(iv) The weighted arithmetic mean of the first 'n' natural numbers is :

(a) $\frac{2n+1}{3}$ (b) $\frac{n+1}{3}$

(c) $\frac{2n+1}{2}$ (d) None of these

(v) The chance that a leap year selected at random will contain 53 sundays is :

(a) $\frac{1}{7}$ (b) $\frac{2}{7}$

(c) $\frac{3}{7}$ (d) None of these

(vi) Two unbiased dice are thrown. Then total number of exhaustive cases are 36.

(True/False)

(vii) $\text{cov}(X + a, Y + b) = \text{cov}(X, Y)$. (True/False)

(viii) If X and Y are random variables taking real values, then $[E(XY)]^2 \leq E(X^2).E(Y^2)$.

(True/False)

(ix) Two independent variables are uncorrelated.

(True/False)

(x) $r_{XY} > 0 \Rightarrow E(XY) > E(X)\ E(Y)$. 10×1=10

2. Answer the following questions in **25** to **50** words.

(i) What are the merits and demerits of median ?

(ii) Discuss coefficients of dispersion.

(iii) State and prove the multiplication theorem of probability. (for two events).

(iv) Discuss the covariance of two random variables X and Y.

(v) Write a brief note on the correlation table. 5×4=20

Part–B

3. (a) Calculate the arithmetic mean of the marks from the following table :

Marks	No. of Students
0–10	12
10–20	18
20–30	27
30–40	20
40–50	17
50–60	6

(b) A cyclist pedals from his house to his college at a speed of 10 k.m. p.h. and back from the college to his house at 15 km p.h. Find the average speed. 2×5=10

4. Calculate the mean and standard deviation for the following table giving the age distribution of 542 members :

Age (in years)	No. of Members
20—30	3
30—40	61

40—50	132
50—60	153
60—70	140
70—80	51
80—90	2

10

Part–C

5. (a) 'n' persons are seated on 'n' chairs at a round table. Find the probability that two specified persons are sitting next to each other.

   (b) If two dice are thrown, what is the probability that the sum is neither 7 nor 11 ? 2×5=10

6. (a) A consignment of 15 record players contains 4 defective. The record players are selected at random, one by one, and examined. Those examined are not put back. What is the probability that the 9th one examined is the best defective ?

   (b) Let A and B be two events such that $P(A) = \frac{3}{4}$ and $P(B) = \frac{5}{8}$, show that $\frac{3}{8} \leq P(A \cap B) \leq \frac{5}{8}$. 2×5=10

Part–D

7. (a) Let X be a random variable with the following probability distribution :

x :	-3	6	9
$P(X = x)$:	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

Find $E(X)$ and $E(X^2)$ and using the laws of expectation, evaluate $E(2X + 1)^2$.

(b) A box contains 2^n tickets among which ${}^nc_i$ tickets bear the number i; $i = 0, 1, 2, \ldots, n$. A group of m tickets is drawn. What is the expectation of the sum of their numbers ? $2 \times 5 = 10$

8. In a sequence of Bernoulli trials, let X be the length of the run of either successes or failures starting with the first trial. Find E(X) and V(X). 10

Part–E

9. Calculate the correlation coefficient for the following heights (in inches) of fathers (X) and their sons (Y) :

X :	65	66	67	67	68	69	70	72
Y :	67	68	65	68	72	72	69	71

10

10. Ten competitors in a musical test were ranked by the three judges A, B and C in the following order :

Ranks by A :	1	6	5	10	3	2	4	9	7	8
Ranks by B :	3	5	8	4	7	10	2	1	6	9
Ranks by C :	6	4	9	8	1	2	3	10	5	7

Using rank correlation method, discuss which pair of judges has the nearest approach to common likings in music. 10

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