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63/2 (SEM-1) MCO 104

2021

(held in 2022)

COMMERCE

(Theory Paper)

Paper : MCO-104

(Business Statistics)

Full Marks – 80

Time – Three hours

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

1. Choose the correct answer : 1×8=8

(a) If A is any even, then

(i) $P(A) < 1$

(ii) $O \leq P(A) \leq 1$

(iii) $P(A) \geq O$

(iv) $O < P(A) < 1$

[Turn over

(b) If P(A) = P(B), then two events A and B are

(i) Independent

(ii) Dependent

(iii) Equally likely

(iv) Both (i) and (iii)

(c) If only two variables are chosen to study correlation between them, then such correlation is called as

(i) Simple correlation

(ii) Multiple correlation

(iii) Partial correlation

(iv) Partial Regression correlation

(d) If the correlation coefficient between the two variables x and y is positive, then the regression coefficient of x and y is

(i) Positive

(ii) Negative

(iii) Positive but less than 1

(iv) Positive but more than 1

(e) Main tools of SQC are

(i) Shewhart's charts

(ii) Acceptance sampling plans

(iii) Both (i) and (ii)

(iv) None of the above

(f) Which of the following is the main limitation of range as a measure of Income Inequality.

(i) It ignores the distribution in between the extremes

(ii) It does not focus on overall distribution

(iii) It ignores the main differences

(iv) None of the above

(g) Formula of Standard Error (S.E) is

(a) S.E. $(\bar{x}) = \frac{\sigma}{s}$

(b) S.E. $(\bar{x}) = \frac{\sigma}{\sqrt{n}}$

(c) S.E. $(\bar{x}) = \sqrt{\sigma + n^2}$

(d) S.E. $(\bar{x}) = \sum \frac{1}{n} + \frac{1}{\sqrt{n}}$

(h) A sample is considered to be large one if

(i) > 30 (ii) < 30

(iii) > 10 (iv) None of the above.

2. Answer the following briefly : $4 \times 4 = 16$

(a) Define any *four* of the following :

(i) Random Experiment

(ii) Trial © Event

(iii) Equally likely Event

(iv) Exhaustive Event

(v) Mutually Exclusive.

(b) Write four differences between Correlation and Regression

(c) Mention four objectives of SQC

(d) Write a short note on statement of central limit theorem.

3. 3 coins are tossed simultaneously at random. Find the probability of getting 14

(i) No Head

(ii) Exactly one head

(iii) At least two heads

(iv) All heads

(v) All tails

(vi) At least two tails.

Or

2 dice are rolled simultaneously. Find the probability of getting 14

(i) a doublet

(ii) the sum of the numbers on the two dice is 8

(iii) the sum of the number on the two dice is 9, but one of the dice must show 3

(iv) sum of numbers on the two dice is at least 10

(v) sum is neither 7 nor 11

(vi) at least one of the dice must show 4.

4. Calculate Karl Pearson Correlation Coefficient from the data given below : 14

X :	2	4	5	6	8	11
Y :	18	12	10	8	7	5

Or

Define Regression Analysis and explain its different types. 14

5. You are given the values of sample mean ($\bar{x}$) and the range (R) for the ten samples of size 5 each. Draw mean and range charts and comments on the state of control of the process. 14

$\bar{x}$:	43	49	37	44	45	37	51	46	43	47
R :	5	6	5	7	7	4	8	6	4	6
Sample No.:	1	2	3	4	5	6	7	8	9	10

You may use the following control chart constants

For n = 5, A_2 = 0.58, D_3 = 0 and D_4 = 2.115

Or

Define Statistical Quality Control. What are the causes of variation in Quality ? Explain the techniques of SQC. 2+4+8=14

6. (a) Write the conditions for applying x^2 test. 4

(b) In a remote village out of 120 people vaccine was administered to 76 people to control viral fever and the following results were obtained :

	Affected	Not affected
Vaccinated	24	52
Not-vaccinated	32	12

Calculate x^2 and discuss the usefulness of vaccine in controlling viral fever.

(5% value of x^2 for one degree of freedom = 3.84) 10

Or

Write a details note on types I and type II error in testing hypothesis with suitable example ? 14