

D 13385

(Pages : 4)

Name.....

Reg. No.....

FIRST SEMESTER M.A. DEGREE EXAMINATION, DECEMBER 2016

(CUCSS)

Applied Economics

Paper III—QUANTITATIVE TECHNIQUES FOR ECONOMIC ANALYSIS

(2012 Admissions)

Time : Three Hours

Maximum : 36 Weightage

Part A

Answer all questions.

Each short answer question carries 1 weightage.

1. Given that $A = \begin{pmatrix} 1 & 1 \\ 2 & -3 \\ 2 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 1 & 2 \\ 3 & -1 & 0 \end{pmatrix}$. Find AB and BA.

2. if $A = \begin{pmatrix} 1 & 2 & 0 \\ -4 & 2 \end{pmatrix}$, $B = \begin{pmatrix} 2 & -7 \\ 5 & 8 \\ 2 & 1 \end{pmatrix}$ then find $(AB)^T$.

3. If $\begin{pmatrix} 8 & x & 2 & y & 2 & 4 \\ y+1 & -2 & & 7 & -x \end{pmatrix} = \begin{pmatrix} & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \\ & & & & & \end{pmatrix}$, then x and y are :

- Describe the terms mutually exclusive events and independence of events. Give examples for each of them?
- Define conditional probability and give expression for the conditional probability of A given B, when A and B are dependent events.
- Given $P(A) = \frac{1}{3}$, $P(B) = \frac{2}{4}$, $P(A \cap B) = \frac{11}{12}$ Find $P(A/B)$.
- Let X denote the number of heads obtained when two coins are tossed. Find the probability distribution of X. Also give its mean and variance.

Turn over

8. A petrol pump proprietor sells on an average Rs. 80,000 worth of petrol on rainy days and an average of Rs. 95,000 on clear days. Statistics from the meteorological department show that the probability is 0.76 for clear weather and 0.24 for rainy weather on coming Monday. Find the expected value of petrol sale on Monday.
9. For a Binomial distribution mean is 12 and variance is 3. Find (i) p, (ii) n, (iii) P (no success).
10. Distinguish between point estimation and interval estimation. Give suitable examples for :
11. Distinguish between unbiasedness and consistency.
12. Define critical region. What is meant by p-value ?
13. Distinguish between (i) null hypothesis and alternative hypothesis, (ii) Type-I error and type-II error.
14. A sample of 200 parts manufactured by a factory, the number of defective parts was found to be 20. The company, however, claimed that only 8 percentage of their products are defective. Is the claim tenable ?

(14 x 1 = 14 weightage)

Part B

*Answer any seven questions.
Each paragraph question carries 2 weightage.*

'3 1 4 2\

15. Find the rank of the matrix $\begin{matrix} 1 & 2 & 3 & -1 \\ 1 & 6 & 2 & i \end{matrix}$
16. Obtain the equilibrium prices of the following market model :

$$qd_1 = 12 + p_1 - 2p_2 \quad qs_1 = -2 + 3p_2$$

$$qd_2 = 18 - p_1 + p_2 \quad qs_2 = -2 + 4p_1$$
17. Define mathematical expectation. The probability that there is at least one error in an accounts statement prepared by A is 0.2 and for B and C they are 0.5 and 0.4 respectively. A, B and C prepared 10, 16 and 20 statements respectively. Find the expected number of correct statements in all.
18. Let X be a random variable with the following probability distribution :

x ; -3 6 9

P(X=x): $\begin{matrix} 1 & 1 & 1 \\ 6 & 2 & 3 \end{matrix}$ 1. Find E (X), E (X²) and V(X).

19. For a Poisson distribution variance is 5. Find (i) $P(X = 1)$ and (ii) $P(\text{at most one success})$.
20. What is meant by sampling distribution and standard error? What are the uses of standard error? Give the sampling distribution of sample proportion.
21. Define t , F and Chi-square distributions.
22. Define confidence interval. Explain how you construct confidence interval for the proportion.
23. Explain Chi-Square test for independence of attributes.
24. A random sample of size 16 has 54 as mean. The sum of the squared deviations from the mean is 135. Can the sample be regarded as taken from the population having 56 as mean. Obtain 95% confidence limits of the mean of the population.

(7 x 2 = 14 weightage)

Part C

*Answer any two questions.
Each essay question carries 4 weightage.*

25. Write down the matrix form of the equations

$$9x + 7y + 3z = 6$$

$$5x - y + 4z = 1$$

$$3x + 5y + z = 2.$$

and find A^{-1} , if :

$$A = \begin{vmatrix} 9 & 7 & 3 \\ 5 & -1 & 4 \\ 3 & 5 & 1 \end{vmatrix}$$

and hence solve the above system of equations.

26. (a) An article manufactured by a company consists of two parts A and B. In the process of manufacture of part A, 9 out of 100 are likely to be defective. Similarly, 5 out of 100 are likely to be defective in the manufacture of part B. Calculate the probability that the assembled part will be defective.
- (b) A problem in Statistics is given to three students A, B and C whose chances of solving it are

$\frac{1}{4}$, $\frac{3}{4}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved.

Turn over

27. An aptitude test for selecting officers in a bank was conducted on 1,000 candidates, the average score is 42 and the standard deviation of the score is 24. Assuming normal distribution for the scores, find
- (a) Number of candidates whose score exceed 58.
 - (b) Number of candidates whose scores lies between 30 and 66.
28. (a) Explain test for goodness of fit. What are the underlying assumption for the goodness of fit test.
- (b) A machine produced 20 defective articles in a batch of 400. After overhauling it produced 10 defective in a batch of 300. Has the machine improved ?

(2 x 4 = 8 weightage)