Reg. No. : ....

Name : ....

First Semester M.A. Degree (Reg./Suppl./Imp.) Examination, October 2018
(2014 Admn. Onwards)
ECONOMICS/APPLIED ECONOMICS/DEVELOPMENT ECONOMICS
EC01C03 : Quantitative Techniques for Economic Analysis

Time : 3 Hours

Max. Marks : 60

PART – A

Answer **all** questions.

1. If the product of a matrix A and its transpose (A') is equal to an identity matrix of the same order, the matrix is
   a) Orthogonal matrix
   b) Diagonal matrix
   c) Singular matrix
   d) Scalar matrix

2. Which of the following probability distribution is not based on a discrete variable ?
   a) Poisson
   b) Binomial
   c) Log normal
   d) None of the above

3. The first central moment of a distribution is
   a) Mean of the distribution
   b) Variance of the distribution
   c) Power of the distribution
   d) Standard error of the distribution

4. Minimum variance estimator is known as
   a) Consistent estimator
   b) Efficient estimator
   c) Unbiased estimator
   d) Point estimator

5. Trace of a matrix is the sum of the elements of
   a) any row
   b) any column
   c) principal diagonal
   d) none of these

P.T.O.

6. When a coin is tossed, getting head and getting tail are
   a) complementary events   b) equally likely events
   c) mutually exclusive events   d) all the above

7. The positioning and spread of the normal curve is determined by the values of
   a) X and μ   b) X and σ
   c) μ and σ   d) all the above

8. A random variable X takes value 1 and 2 with corresponding probabilities $\frac{1}{3}$ and $\frac{2}{3}$. Find expectation of X
   a) $\frac{5}{3}$ b) $\frac{9}{3}$ c) $\frac{2}{9}$ d) $\frac{3}{5}$ (8×½=4)

PART – B

Answer **any 8** questions.

9. What are the desirable properties of a good estimator ?

10. Distinguish between Type I and Type II errors.

11. Define :
   a) Sampling distribution.
   b) Standard error.

12. Distinguish between null hypothesis and alternative hypothesis.

13. Given $A = \begin{bmatrix} 2 & 8 \\ 3 & 0 \\ 5 & 1 \end{bmatrix}$ $B = \begin{bmatrix} 2 & 0 \\ 3 & 8 \end{bmatrix}$ can you calculate BA ? Why ?

14. Define :
   a) Confidence interval and
   b) Critical region.

15. Distinguish between estimate and estimator.

16. What is central limit theorem ?

P.T.O.

17. What is a standard normal variate ?

18. Distinguish between continuous and discrete random variable.

19. Two coins are tossed. What is the probability of getting (a) both heads (b) at least one head.

(8×2=16)

PART – C

Answer **any 4** questions.

20. Find the probability that in a family of 4 children there will be (a) at least 1 boy (2) at least 1 boy and at least 1 girl. Assume that the probability of a male birth is ½.

21. Write a note on Log normal distribution.

22. A random variable of size 16 has 53 as mean. The sum of squares of the deviations taken from mean is 150. Obtain 95% and 99% confidence limits of the population mean.

23. Define a random variable. What do you mean by (a) distribution of a random variable (b) expectation of a random variable ?

24. Evaluate the determinant $\begin{vmatrix} a^2 & a & 1 \\ b^2 & b & 1 \\ c^2 & c & 1 \end{vmatrix}$.

25. Find the probability of a 4 turning up at least once in two tosses of a fair die.   (4×5=20)

PART – D

Answer **any two** questions.

26. Find the characteristic equation and characteristic roots of the matrix.

$$A = \begin{bmatrix} 1 & 2 & 2 \\ 0 & 2 & 1 \\ -1 & 2 & 2 \end{bmatrix}$$

P.T.O.

27. An urn contains 4 defective and 8 non defective balls. A second urn contains 2 defective and 6 non-defective balls. A ball is drawn from one of the the urns selected at random. Find the following probabilities.

    a) That the ball drawn is defective

    b) That the ball drawn is non defective

    c) That the ball is drawn from the first urn, given that it was a defective ball

28. a) Explain students t distribution and its uses in statistical tests.

    b) A stenographer claims that she can take dictation at least at the rate of more than 120 words per minute of the 12 tests given to her she could perform an average of 135 words with a standard deviation of 40. Is her claim valid $(\propto = 0.01)$?

29. a) Define cofactor of an element of a matrix. If $A = \begin{bmatrix} 3 & 4 & 7 \\ -2 & 5 & 6 \\ 7 & 3 & -9 \end{bmatrix}$ find the co-factors of elements 6, –9.

    b) Define rank of a matrix. Find the rank of matrix $A = \begin{bmatrix} 5 & 2 & 1 \\ 0 & 1 & 3 \\ 2 & 1 & 0 \end{bmatrix}$. **(2×10=20)**

_____