II Semester B.A. Degree (CCSS – Supple./Improv.) Examination, May 2015
(2011 and Earlier Admn.)
COMPLEMENTARY COURSE IN ECONOMICS
2C02 ECO : Mathematics for Economic Analysis – II

Time : 3 Hours

Max. Weightage : 30

Instructions : *Answers may be written either in **English** or in **Malayalam**.*

PART – A

Objective type questions – In Bunches of **two** choose the correct answer.

I

1. If $A^3 = A$, A is of period _____
   a) 3   b) 2   c) one   d) zero

2. $a_{ij} = 0 \; \forall \; i < j$ in _____ matrices.
   a) Upper triangular   b) Lower triangular
   c) Diagonal   d) Square and scalar

3. Determinant value of a singular matrix.
   a) equal to zero   b) not equal to zero
   c) equal to constant   d) equal to one

4. Derivative of Marginal Cost $= {}^-6$ implies, total cost is
   a) Maximum   b) Minimum
   c) Maximum or Minimum   d) Cannot predict   **(Weightage 1)**

II

5. In $y = f(X)$, integral of a constant is
   a) constant   b) zero   c) one   d) constant times X

6. If $A^2 = 0$, A is a _____ matrix
   a) Orthogonal   b) Idempotent   c) Nil potent   d) Null

7. A unit matrix is a _____
   a) square matrix   b) diagonal matrix
   c) scalar matrix   d) all of these

8. Find function of total cost if its MC = $2 + x + x^2$ and TC = Rs 50 at x = 0 where x is the output.
   a) TC = 0   b) TC = 50

   c) TC = $\dfrac{x^3}{3} + \dfrac{x^2}{2} + 2x + 50$ d) TC = C + 2x + $\dfrac{x^2}{2} + \dfrac{x^3}{3}$

                                                        (Weightage 1)

PART – B

Short answer questions. Answer **any ten** questions.

9. Define symmetric matrix.

10. Explain the relation of symmetric matrices with quadratic forms.

11. Define characteristic vectors and hence characteristic roots.

12. Find $\int 4x^3 \, dx$.

13. Evaluate $\int_0^1 \sqrt{t} \, dt$.

14. If marginal propensity to save is $0.5 + 0.2 \, Y^{-2}$ find the consumption function.

15. Write the Reversal law of inverses.

16. Define orthogonal matrix.

17. Define trace of a matrix.

18. What is meant by linear dependence of vectors ?

19. If MR = $16 - x^2$, find the maximum revenue ?

20. Explain augmented matrix.

                                                        (10×1=10)

PART – C

Short essay, answer **any five** questions.

21. Define inverse of a matrix and explain the conditions for the existence of an inverse, by the determinant method.

22. Evaluate $\begin{bmatrix} P & O \\ O & Q \end{bmatrix} \begin{bmatrix} P_1 & O \\ O & Q_1 \end{bmatrix}$

23. What are the uses of vectors and matrices in Economic Analysis ?

24. Explain rank of a matrix determine the rank of $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ -3 & -6 & -9 \end{bmatrix}$.

25. Define vector. Test whether the vectors [1 2 3] and [2 – 2 0] are linearly dependent or independent.

26. Explain Consumer's surplus.

27. What are the properties of determinants ?   **(5×2=10)**

PART – D

Long essay. Answer **any two** questions.

28. Evaluate the area above X-axis bounded by a total product function when MP = $(4 – 3x)^5$ whenever x = 1 and x = 3.

29. Obtain A^{-1} if A = $\begin{bmatrix} 3 & 4 \\ 1 & 2 \end{bmatrix}$ by Gauss Elimination method.

30. Explain Cramer's rule.

31. Explain optimisation conditions of quadratic forms subject to linear constraints.   **(2×4=8)**

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