Seat No:_____                                             EnrollmentNo:_____

# PARUL UNIVERSITY
## FACULTY OF ARTS
### B.Arts Winter 2017 – 18 Examination

Semester: 2                                                          Date: 27/12/2017
Subject Code: 15101152                                              Time: 10:30 am to 1:00 pm
Subject Name: Mathematical Methods for Economcis-I                  Total Marks: 60

**Instructions:**
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1  Do as directed.**

**A. Multiple choice type questions.**                                                    **(08)**

1. $\text{Log}_5 (625)$?
   - a) 4
   - b) 8
   - c) 6
   - d) None of these

2. $\text{Log}_5 (0.008)$?
   - a) -2
   - b) -3
   - c) 5
   - d) None of these

3. _____ Variable are those which do not depend on other variables.
   - a) Dependent
   - b) Independent
   - c) Both a) and b)
   - d) None of these

4. The input coefficients/ elements of which of the following matrices are interpreted as inputs required directly and indirectly per unit of final demand.
   - a) A
   - b) (I-A)
   - c) $(I-A)^{-1}$
   - d) All of the above

5. In linear programming problem involving two variables multiple optimal solsutions are obtained when one of the constrains is_____.
   - a) The objective function should be parallel to a constraint that forms boundary of the feasible region.
   - b) The objective function should be perpendicular to a constraint that forms the boundary of the feasible region.
   - c) Neither A) nor B)
   - d) Not constraints should be parallel to each other.

6. Value of determinant is computed by adding multiples of one row to _____.
   - a) Another row
   - b) Another column
   - c) Another dimension
   - d) Another matrix

7. According to determinant properties, multiple of one row is added to another row then determinant _____.
   - a) Changed
   - b) multiplied
   - c) unchanged
   - d) added

8. An input-output model which has endogenous final demand vector is known as _____.
   - a) Open Input-output model
   - b) Close Input-output Model
   - c) Static Input- output Model
   - d) Dynamic Input-output Model

9. Linear programming technique was developed for the first time by_____.
   - a) Koopmans
   - b) Danzig
   - c) Leontief
   - d) Mahalanobis

10. For a viable Input-output system which conditions are postulated?
    - a) Hawkins- Simon condition
    - b) Kuhn –Tucker condition
    - c) Bhagawati- Eckaus condition
    - d) Von-Neumann condition

11. Input-output Technique was invented by_____.
    - a) Gunnar Myrdal
    - b) Wassily Leontief
    - c) Hollis B. Chenery
    - d) Robert Solow

12. _____ Function is one which has no breaks in its curve.
   a) Limits
   b) Continuity
   c) Both a) and b)
   d) None of these
13. _____ is the process of finding the derivative of a function.
   a) Continuity
   b) differentiation
   c) Both a) and b)
   d) None of these
14. Indication of number of rows and number of columns in a matrix is classified as _____.
   a) Direction
   b) Dimension
   c) Classification
   d) Specification
15. If $Y = 8x^3$, then $dy/dx$ = ?
   a) $26x^2$
   b) $20x^2$
   c) $24x^2$
   d) $12x^2$
16. If $y = 3x + 4$, then $f(0)$ = ?
   a) 4
   b) 3
   c) 2
   d) None of these

**B. Define terms** (07)
   1. Convexity
   2. Variable
   3. Differentiation
   4. Relative Extrema
   5. Equation[
   6. Optimization
   7. Function

**Q.2 Answer the following.**
   **A.** What is the role of linear algebra? (04)
   **B.** What is increase and decreasing function? (04)
   **C.** What is concavity and convexity? (04)

**OR**

   **C.** What is inflection point? (04)

**Q.3 Answer the following.**
   **A.** Using Carmer's rule solves the equation. (05)
   a) X- 3Y = 4               b) 7X – 7Y = 8
      5X+7Y +8                   -5X – 3Y = 2

   **B.** Find the sum A + B of the following matrices. (05)
   1) $A = \begin{bmatrix} 8 & 9 \\ 12 & 7 \end{bmatrix}$   $B = \begin{bmatrix} 13 & 4 \\ 2 & 6 \end{bmatrix}$

   2) $A = \begin{bmatrix} 7 & -10 \\ -8 & 2 \end{bmatrix}$   $B = \begin{bmatrix} 8 & 4 \\ 12 & -6 \end{bmatrix}$

   **C.** Find the difference A-B for each of the following matrices. (05)
   1) $A = \begin{bmatrix} 3 & 7 \\ 12 & 9 \end{bmatrix}$   $B = \begin{bmatrix} 6 & 8 \\ 9 & 5 \end{bmatrix}$

   2) $A = \begin{bmatrix} 16 \\ 2 \\ 15 \\ 9 \end{bmatrix}$   $B = \begin{bmatrix} 7 \\ 11 \\ 3 \\ 8 \end{bmatrix}$

**OR**

   **C.** Change the following logarithms to their equivalent exponential forms. (05)
   1) $\log_8 64 = 2$          2) $\log_2 y = 7x$
   3) $\log_a y = 6x$          4) $32 = 2^5$

**Q.4  Answer the following.**

**A.** Find the determinant |A| for the following matrices.                                                                (06)

1)   $A = \begin{pmatrix} 9 & 13 \\ 15 & 18 \end{pmatrix}$       2) $= \begin{pmatrix} 40 & -10 \\ 25 & -5 \end{pmatrix}$       3)  $A = \begin{pmatrix} 7 & 6 \\ 9 & 5 \\ 2 & 12 \end{pmatrix}$

**B.** Find the equilibrium price and quantity for the following market.                                                    (06)

1)   $Q_s = -20 + 3P$                2)  $Q_s = -45 + 8P$
     $Q_d = 220 - 5P$                    $Q_d = 125 - 2P$

3)   $Q_s + 32 - 7P = 0$
     $Q_d - 128 + 9P = 0$

**C.** What is Input-Output analysis? Explain its main features and importance.                                            (06)

**OR**

**C.** What is Linear programming? What are the assumptions for linear programming of the firm, give one    (06)
example.