MATHEMATICAL ECONOMICS

OBJECTIVE MULTIPLE CHOICE QUESTIONS

VI SEMESTER

CORE COURSE: ECO6 B12

For

B.A. ECONOMICS
(2014 -15 ADMISSIONS ONWARDS)

UNIVERSITY OF CALICUT

SCHOOL OF DISTANCE EDUCATION

1. _____is a simplified description of reality, designed to yield hypotheses about economic behaviour that can be tested:

   (a) An economic model (b) An assumption (c) A hypothesis (d) None of these

2. _____ is the best criteria to judge the validity of a model :

   (a) Assumptions (b) Information it provides (c) Its simplicity (d) predictive power

3. The given function $f(x) = ax + b$, is an example of ____ function:

   (a) quadratic (b) polynomial (c) linear (d) rational

4. The given function $f(x) = ax^2 + bx + c$, is an example of ____ function:

   (a) quadratic (b) polynomial (c) linear (d) rational

5. For a utility function $u = xy + 3x + 4y$, marginal utility of good x is:

   (a) $xy + 3x + 4y$ (b) $y + 3$ (c) $x + 4$ (d) $y + 3x$

6. Given a consumption function $C = 250 + 0.75Yd$, autonomous consumption is ____

   (a) 0.75 (b) 0 (c) 250 (d) -0.75

7. Given a saving function $S = 100 + 0.8Y$, MPC is:

   (a) 100 (b) 0.8 (c) −100 (d) 0.2

8. A _____ function provides an abstract mathematical representation of the relation between the production of a good or service and the inputs used.

   (a) consumption (b) production (c) revenue (d) technology

9. For a total cost function $TC = 1.5Q^2 + 4Q + 46$, MC is :

   (a) $1.5Q + 4 + \frac{46}{Q}$ (b) $1.5Q + 4$ (c) $1.5Q$ (d) $4Q + 46$

10. ____ function shows the functional relation between investment and rate of interest or income:

    (a) consumption (b) production (c) investment (d) income

11. Abstraction from reality is made based on :

    (a) assumptions (b) prediction (c) theory (d) hypothesis

12. ____ is a simplified description of reality, designed to yield hypothesis about economic behaviour that can be tested.

    (a) theory (b) postulate (c) proposition (d)economic model

13. ____ models are simply pictures of an abstract economy; graphs with lines and curves that tell an economic story.

    (a) Empirical (b) Visual (c) Mathematical (d)Simulation

14. ____ models are mathematical models designed to be used with data.

(a) Empirical (b) Visual (c) Mathematical (d)Simulation

15._____ function expresses the relationship between price of the good and quantity of the good demanded.

(a) Supply (b) Consumption (c) Demand (d)Income

16. _____ function expresses the relationship between price of the good and quantity of the good supplied.

(a) Supply (b) Consumption (c) Demand (d)Income

17. Function which map the relation between the physical measure of money and the perceived value of money is _____

(a) Income (b) Investment (c) Demand (d)Utility

18. _____ function was designed by J M Keynes to show the relationship between real disposable income and consumer spending.

(a) Consumption (b) Investment (c) Demand (d)Utility

19. Given the consumption function C = a + bY, where 'a', the intercept, represents_____

(a) Income (b) autonomous consumption (c) Demand (d)Saving

20. Given the consumption function C = a + bY, the slope 'b' represents:

(a) MPS (b) autonomous consumption (c) MPC (d)Saving

21. Given the total cost function TC = $1.5Q^2 + 4Q + 46$, marginal cost is:

(a) $3Q + 4$ (b) $1.5Q^2 + 4Q$ (c) $1.5Q + 4 + 46/Q$ (d)$1.5Q^2 + 46$

22. When total cost in a production is given by C = 4x + 500 then fixed cost is _____

(a) 0 (b) 500 (c) 504 (d) 4

23. For equilibrium market, the condition is____

(a) Demand > supply (b) demand <supply (c) demand = supply (d) None of these

24. Given TR = 10x, TC = 5x+2, profit function is :

(a) 5x – 2 (b) 5x (c) 10x – 5x (d) 5x + 2

25. Demand function for a commodity is D = 44 – 7P and supply function S = 2P –10, then the equilibrium price is:

(a) 4 (b) 6 (c) 8 (d) 10

26. If $u = x^n$ is total utility, the functions of marginal utility u will be:

(a) nx^{n+1} (b) nx^{n-1} (c) x^{n+1} (d) $\frac{x^{n+1}}{n}$

27. Utility is maximized when the second order conditions of utility function is:

(a) Negative (b) positive (c) zero (d) None of these

28. For the demand function Q = f(p), elasticity of demand is given by:

(a) $\frac{dq}{dp}$ (b) $\frac{dp}{dq}$ (c) $\frac{dp}{dq} \cdot \frac{p}{q}$ (d) $\frac{dq}{dp} \cdot \frac{p}{q}$

29. $\frac{AR}{AR - MR}$ gives the :

(a) Elasticity of demand (b) elasticity of cost

(c) iso revenue live (d) elasticity of supply

30. When the total revenue functions is $R = 100 - X^2$, the marginal revenue is :

(a) 100 – 2X (b) 100 (c) $-2X$ (d) $-X^2$

31. The cost per output is given by C = 2x + 27. Then the marginal cost when x = 5 is:

(a) 2 (b) 27 (c) 0 (d) 47

32. Given the utility functions $u = f(q_1, q_2)$. The functions will be maximized at;

(a) $\frac{du}{dq_1} = 0$ (b) $\frac{d^2u}{dq_1} < 0$ (c) Both a and b (d) None of the above

33. When elasticity of demand is 2, the demand will be:

(a) Perfectly elastic (b) Perfectly inelastic

(c) Relatively elastic (d) Unit elastic

34. The Price elasticity of demand for a product is 1.5 and its MR = 8, find its price:

(a) 12 (b) 24 (c) 53 (d) 16

35. The elasticity of demand for the demand curve of a firm under perfect competition is

(a) 1 (b) 0 (c) -1 (d) α

36. Given a total utility function, Marginal utility is obtained by finding _____

(a) First derivative (b) Second derivative (c) Integral (d) Coefficient

37. Mathematically ____ is the first derivative of the consumption function.

(a) MPS (b) MPC (c) MPI (d) GDP

38. ____ indicates what proportion of the increased income will be saved.

(a) MPS (b) MPC (c) MPI (d) GDP

39. _____ measures the change in TP due to a one unit change in the quantity of labour used:

(a) MPC (b) MPS (c) MPI (d) MPP_L

40. ____ refers to the change in total cost (TC) due to the production of an additional unit of output.

(a) MPC (b) MC (c) MPI (d) MPP_L

41. $\frac{MP_L}{MP_K} =$ ___

(a) MPC (b) MC (c) $MRTS_{LK}$ (d) MPP_L

42. The slope of ___curve will be positive if and only if the marginal cost curve lies above the AC curve.

(a) AC (b) MC (c) ATC (d) MP

43. At a price of Rs11.00, quantity demanded is 90; and at a price of Rs.9.00, quantity demanded is 110. The price elasticity of demand is:

(a) 0.8 (b) 1 (c) 1.5 (d) -1.22

44. The government wants to reduce the consumption of electricity by 5%. The price elasticity of demand for electricity is 00.4. The government should:

(a) raise the price of electricity by 2% (b) lower the price of electricity by 0.4% (c) raise the price of electricity by 12.5% (d) raise the price of electricity by 0.8%

45. Total utility will be a maximum when___

(a) marginal utility equals total utility (b) marginal utility is zero (c) marginal utility equals average utility (d) marginal utility is positive

46. For complementary goods the cross elasticity of demand will be _____

(a) negative (b) zero (c) positive (d) any of these

47. Necessities have _____ elasticity of demand of between 0 and +1.

(a)cross (b) price (c) income (d) any of these

48. If your income doubles and the prices of the goods you buy double, then your demand for these goods will likely _____

(a) increase (b) not change (c) decrease (d) shift

49. Which of the following situations would be most favourable for a company with an income elasticity of demand for its product of +3 to plan for an increase in output:

(a) Money incomes to rise by 5 per cent and prices by 6 per cent(b) Money incomes to rise by 6 per cent and prices by 5 per cent (c) Money incomes to rise by 3 per cent and prices by 4 per cent (d) Money incomes to rise by 4 per cent and prices by 2 per cent

50. Football socks are found to have a cross-elasticity of demand of −2 with respect to product Y. Which of the following products is most likely to be product Y:

(a)Cricket boots (b) Tennis shoes (c)Tennis socks (d) Football boots

51. The process of finding relative maximum or minimum of a function is known as :

(a) optimization (b) minimisation (c) maximisation (d) any of these

52. A ____ is a point at which a function is at a relative maximum or minimum:

(a) plateau (b) relative extremum (c) inflection (d) critical value

53. The value of Lagrange multiplier λ gives the approximate change in the objective function caused by a small change in the:

(a) constant of the constraint (b) objective function (c) variables in the constraint

(d) any of these

54. If TR is $75Q - 4Q^2$, MR is:

(a) 75 (b) 75 – 8Q (c)75 Q – 4 (d) None of these

55. Given TC = $Q^2 + 7Q + 23$, what is 2Q + 7:

(a) AC (b) minimum TC (c) maximum TC (d) MC

56. If $MRTS_{LK} = 2$, then $\frac{MP_k}{MP_L}$ is:

(a) 2 (b) 1 (c) ½ (d) 4

57. The first derivative measures the rate of change or ____ of a function:

(a) intercept (b) convexity (c) slope (d) concavity

58. For a cost function TC = $3Q^2 + 7Q + 12$, MC is :

(a) 6Q (b) 6Q + 7 (c) 3Q + 7 (d) undefined

59. For a cost function TC = $3Q^2 + 7Q + 12$, AC is:

(a) 3Q + 7 (b) 6Q + 7 (c) $3Q + 7 + {}^{12}/_{Q}$ (d) undefined

60. MR is :

(a) the second order derivative of TR (b) the first order derivative of TC

(c) the first order derivative of TR (d) the first order derivative of TR

61. In optimisation, with the first order derivative equal to ___ and the second order derivative ___ the function is at a maximum.

(a) 0, 0 (b) 0, < 0 (c) 0, > 0 (d) > 0, 0

62. When we optimise a function, with the first order derivative equal to ___ and the second order derivative ___ the function is at a relative minimum.

(a) 0, 0 (b) 0, < 0 (c) 0, > 0 (d) > 0, 0

63. The Cobb Douglas Production function $Q = AL^{\alpha}K^{1-\beta}$ represents:

(a) Diminishing returns to scale (b) Increasing returns to scale

(c) Constant returns to scale (d) None of the above

64. Let Q = F(L, K) be a production function. Its marginal productivity of capital is given by:

(a) $\frac{\partial Q}{\partial K}$ (b) $\frac{\partial Q}{\partial L}$ (c) $\frac{\partial Q}{\partial K} \cdot \frac{L}{K}$ (d) $\frac{\partial Q}{\partial K} \cdot \frac{K}{L}$

65. A consumer has a money income of Rs. 100. He purchases 2 commodities X_1 and X_2 at prices Rs. 2 and Rs. 5 respectively. His budget constraint is:

(a) $2q_1 + 5q_2 = 100$ (b) $2q_1 - 5q_2 = 100$ (c) $\frac{2q_1}{5q_2} = 100$ (d) $\frac{5q_2}{2q_1} = 100$

66. In Cobb Douglas Production of functions, the elasticity of Substitutions is :

(a) greater than one (b) equal to one

(c) less than one (d) None of these

67. The output elasticity of labour measure which of the following, if Q stands for output and L refers to labour:

(a) $\frac{dQ}{dL}$ (b) $\frac{dL}{dQ}$ (c) $\frac{\%dQ}{\%dL}$ (d) any of these

68. If $MRTS_{LK} = 2$, then $\frac{MP_k}{MP_L}$ is:

(a) 2 (b) 1 (c) ½ (d) 4

69. Where $\alpha = {}^{3}/_{4}$ and $\beta =, {}^{1}/_{4}$, the returns to scale for the Cob Douglas Productions functions is:

(a) Increasing (b) Decreasing

(c) constant (d) can not say without additional data

70. Feasible solution of LPP is:

(a) Values of decision variables satisfy the constraints

(b) Values of decision variables satisfy the objective functions

(c) Values of variable satisfy the objective functions

(d) the value of the objective function

71. In linear programming, the dual of maximization is equal to:

(a) minimization (b) Shadow Pricing

(c) Maximisation (d) None of these

72. Linear Programming deals with:

(a) Constraints (b) Inequalities (c) Objective functions (d) All the above

73. A production function is said to be _____, if, when each input factor is multiplied by a positive real constant k, the constant can be completely factored out:

(a) homogenous (b) nonhomogenous (c) additive (d) heterogonous

74.____ functions are a special class of homogeneous function in which the marginal rate of Technicalsubstitution is constant along the function.

(a) Hypothetic (b) Homothetic (c) Objective (d) Value

75. In linear programming, the number of technical constraints will be ___the number of the factors of production:

(a) equal to (b) smaller than (c) greater than (d) the same as

76. In linear programming,the technical constraints express the fact that the quantity of factors which will be absorbed in the production of commodity _____the available quantities of these

factors:

(a) should exceed (b) should be equal to (c) cannot exceed (d) both (a) and (b) possible

77. In linear programming, _____are expressed as inequalities, rather than equalities.

(a) the technical constraints (b) objective functions (c) dual (d) primal

78. In linear programming, _____ expresses the necessity that the levels of production of the commodity cannot be negative, that is, it should be either positive or zero.

(a) the technical constraints (b) objective functions (c) non negativity constrains (d) primal

79. In input-output analysis, ___ shows the transactions of the whole economy in the form of output of each industry as distributed among the other industries as intermediate products and the final demand sector.

(a) the transaction matrix (b) objective functions (c) non negativity constrains (d) the technology matrix

80. In input-output analysis, ___ represents in monetary terms or quantitative terms all the transactions of the economic system.

(a) the transaction matrix (b) objective functions (c) non negativity constrains (d) the technology matrix

81. In input-output analysis,____ shows the number of units of any industry's output needed to produce one unit of another industry's output.

(a) the transaction matrix (b) The technical coefficients (c) non negativity constrains (d) the technology matrix

82. In input-output analysis,____ is obtained by dividing the input of the desired sector by the total output of the same sector.

(a) the transaction matrix (b) a technology coefficient (c) non negativity constrains (d) the technology matrix

83. In input-output analysis,when the technical coefficients are put in the form of a matrix, we get the_____

(a) the transaction matrix (b) a technology coefficient (c) non negativity constrains (d) the technology matrix

84. In input-output analysis,when The conventional model of IOA assumed that there are 'n' productive sectors and prepared an input output table of order n×n. If we add an open sector to it, we get the _____

(a) the transaction matrix (b) a technology coefficient (c) Leontief open model (d) the technology matrix

85. In input-output analysis,if the exogenous sectors of the open input output model is absorbed in to the system as just another sector _____

(a) the transaction matrix (b) a technology coefficient (c) Leontief closed model (d) the technology matrix

86. In an input-output matrix, the element ____shows the input industry II takes from industry I.

(a) a_{12} (b) a_{21} (c) a_{11} (d) a_{22}

87. In an input-output matrix, the principal diagonal of this matrix represents the amount of input each industry takes from ___output.

(a) other industry's (b) government sector's (c) household sector's (d) its own output

88. For effective price discrimination in monopoly the demand elasticity in different markets should be: (a) Same (b) different (c) Zero (d) None of these

89. P = a – bQ is the demand cure of a monopolist. Which of the following statements is true?

(a) AR & MR are equal

(b) The rate of decline of MR is twice the rate of decline of AR

(c) The demand curve has unit elasticity (d) slope of MR is zero.

90. R = R (Q) and C = C(Q) are the revenue and cost functions of a firm. The first order conditions for firm's short run equilibrium is:

(a) $R'(Q) = C'(Q)$ (b) $R'(Q) < C'(Q)$

(c) $R'(Q) > C'(Q)$ (d) None of the above

91. The best or optimum level of output for a perfectly competitive firm is given by the point:

(a) MR = AC (b) MR = MC

(c) MR exceeds MC by the greater amount

(d) MR = MC and MC is rising

92. In a monopoly, marginal revenue is:

(a) equal to AR (b) less than AR

(c) more than AR (d) initially less than AR then more than AR

93. In monopoly, when the demand curve is elastic, MR is:

(a) 1 (b) 0 (c) positive (d) negative

94. In monopoly, if p = Rs. 10 at the point on the demand curve where $\eta = 0.5$, MR is:

(a) 5 (b) 0 (c) −1 (d) −10

95. If the demand curve for a monopolist is P = 100 -20Q, then the marginal revenue of that firm is given by the equation:

(a) MR = 200 − 20Q (b) MR = 50 − 40Q

(c) MR = 100 − 20Q (d) MR = 100 − 40Q

96. If the demand facing a monopolist is P = 100 − 10Q and marginal cost is constant at 20, then the profit maximizing price and quantity for this monopolist are:

(a) P = 60 and Q = 4 (b) P = 20 and Q = 8

(c) P = 90 and Q = 10 (d) P = 4 and Q = 60

97.A profit-maximizing monopoly firm with a demand curve P = 50 − Q is a perfect price-discriminator. If it has marginal costs of Rs. 10/unit and fixed costs of Rs. 30, it will produce _____ units of output and will make_____ profit.

(a) 40; Rs. 400 (b) 40; Rs. 770 (c) 20; Rs. 370 (d) 20; Rs. 400

(Hint :Since the profit-maximizing level of output occurs where the marginal cost function intersects the demand function, the quantity is 40 units. Profit is the area under the demand curve minus the Rs.400 variable cost and Rs.30 fixed cost, or 1200 - 430 = Rs.770)

98. A price discriminating Monopolist is considered more efficient than a single prices monopolist because:

(a) a price discriminating Monopolist knows its consumers better

(b) a price discriminating Monopolist can set prices more efficiently

(c)a price discriminating Monopolist produces a higher level of output

(d)a price discriminating Monopolist can produce it's output at a lower cost

99. One difference between perfect competition and monopolistic competition is that:

(a) In perfect competition, the products are slightly differentiated between firms

(b) There are a larger number of firms in monopolistic competition

(c)There are a smaller number of firms in perfectly competitive industries

(d)Firms in monopolistic competition have some degree of market power

100. A perfectly competitive firm should reduce output or shut down in the short run if market price is equal to marginal cost and price is:

(a) greater than average total cost (b) less than average total cost

(c)greater than average variable cost (d)less than average variable cost

101. The market demand curve for a perfectly competitive industry is QD = 12 - 2P. The market supply curve is QS = 3 + P. The market will be in equilibrium if:

(a) P = 6 and Q = 9 (b) P = 3 and Q = 6

(c)P = 4 and Q = 4 (d)P = 5 and Q = 2

102. In the short run, a monopolist will shut down if it is producing a level of output where marginal revenue is equal to short-run marginal cost and price is:

(a) less than average variable cost (b) greater than average variable cost.

(c)less than average total cost (d)greater than average total cost

Answer Key

1. (a) An economic model **2.** (d) predictive power **3.** (c) Linear **4.** (a) Quadratic **5.** (b) y + 3 **6.** (c) 250**7.** (d) 0.2 **8.** (b) production**9.** (a) $1.5Q + 4 + \frac{46}{Q}$**10.** (c) investment**11.** (a) assumption**12.** (d)economic model **13** (b) Visual**14.** (a) Empirical **15.** (c) Demand **16.** (a) Supply **17.** (d) Utility **18.** (a) Consumption **19.** (b) autonomous consumption **20.** (c) MPC **21.**(a) 3Q + 4**22.**(b) 500 **23.** (c) demand = supply **24.** (a) 5x – 2 **25.**(b) 6 **26.** (b) nx^{n-1}**27.** (a) Negative **28.** (c) $\frac{dp}{dq} \cdot \frac{p}{q}$ **29.** (a) Elasticity of demand **30.** (c) $-2X$ **31.**(d) 47 **32.** (c) Both a and b **33.** (c) Relatively elastic **34.** (b) 24, **35.** (d) α **36.** (a) First derivative **37.** (b) MPC **38.** (a) MPS **39.** (d) MPP_L**40.**(b) MC **41.** (c) $MRTS_{LK}$ **42.** (a) AC **43.**(d) -1.22 **44.** (c) raise the price of electricity by 12.5% 45. (b) marginal utility is zero 46. (a) negative **47.** (c) income **48.** (b) not change **49.**(d) Money incomes to rise by 4 per cent and prices by 2 per cent **50.**(d) Football boots, **51.** (a) optimization 5**2.** (b) relative extremum 5**3.** (a) constant of the constraint **54.**(b) 75 – 8Q **55.** (d) MC 5**6.** (c)½ 5**7.** (c) slope 5**8.** (b) 6Q **59.** (c) $3Q + 7 + {}^{12}/_{Q}$ **60.** (d) the first order derivative of TR **61.** (b) 0, < 0 **62.**(c) 0, > 0 **63.** (c) Constant returns to scale 64. (a)$\frac{\partial Q}{\partial K}$ **65.** (a) $2q_1 + 5q_2 = 100$ **66.** (b) equal to one **67.** (c) $\frac{\%DQ}{\%DL}$ **68.**(c) ½ **69.** (c) constant 70. (b) Values of decision variables satisfy the objective functions **71.** (a) minimization **72.** (d) All the above **73.** (a) homogenous **74.** (b) Homothetic **75.**(d) the same as **76.**(c) cannot exceed **77.**(a) the technical constraints **78.** (c) non negativity constrains **79.** (a) the transaction matrix **80.** (a) the transaction matrix **81.**(b) The technical coefficients **82.** (b) a technology coefficient **83.**(d) the technology matrix **84.**(c) Leontief open model **85.**(c) Leontief closed model **86.**(a) a_{12} **87.**(d) its own output, **88.** (b) different **89.**(b) The rate of decline of MR is twice the rate of decline of AR , **90.** (a)$R^{'}(Q) = C^{'}(Q)$, **91.** (d) MR = MC and MC is rising, **92.** (b) less than AR **93.** (c) positive **94.** (d) −10 **95.**(d) MR = 100 − 40Q **96.**(a) P = 60and Q = 4 **97.**(b) 40; Rs. 770 **98.** (c)a price discriminating Monopolist produces a higher level of output **99.**(d) Firms in monopolistic competition have some degree of market power **100.**(d)less than average variable cost **101.**(b) P = 3 and Q = 6 **102.**(a) less than average variable cost