BRAINWARE UNIVERSITY

Course – MCOM

Mathematics for Business Research (MCM204)

(Semester – 2)

Time allotted: 3 Hours **Full Marks : 70**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question) 10 x 1 = 10

1. *Choose the correct alternative from the following*

(i) The shape of the chance node

a. circular b. square

c. hyperbolic d. asymptotic

(ii) The error which occurs when the right sample is rejected

a. Type I error b. Type II error

c. Type III error d. Type IV error

(iii) Inflation is measured with the help of

a. Index No b. Segmentation Model

c. Cost Index Model d. Power Sizing Model

(iv) The point where a curve changes its curvature is called the point of

a. Inflation b. Deflation

c. Inflexion d. Interest

(v) The Index Number which conforms to the Time Reversal Test

a. Fischer b. Paasche

c. Laspeyers d. None of these

(vi) Y = logx then y_1

a. 1 b. 2x

c. I/x d. 1.5

(vii) If y= 5x then y_2 =

a. 0 b. 2.5

c. 5 d. -5

(viii) A Linear Programming problem in two variable does not comprise the following

a. Slack variables b. Decision variables

c. Non negativity restrictions d. Objective Function

(ix) What is the probability that an even number appears in one throw of the dice?

a. 1/6 b. 1/3

c. 1/2 d. 1/4

(x) The lowest point of depression is called

a. recession b. boom

c. expansion d. trough

Group – B

(Short Answer Type Questions) 3 x 5 = 15

Answer any *three* from the following

2. Draw graphically the feasible set

   $2x+y\leq100$,$x+y\leq80$,$x\geq0$,$y\geq0$ [5]

3. Diagrammatically represent the various phases of business cycle. [5]

4. Mention the three types of Decision making. [5]

5. Explain the Total Probability Theorem. [5]

6. Write a short note on Risk associated with Business [5]

Group – C

(Long Answer Type Questions) 3 x 15 = 45

Answer any *three* from the following

7. (a) State the uses of Index Number [8]

   (b) Identify the following regression lines x+4y+3=0 and 4x+9y+5=0 [7]

8. (a) Describe the decision tree [8]

   (b) A glass factory that specializes in crystal is developing a substantial backlog and for this the firm's management is thinking three alternative course of action. a)To arrange for subcontracting (S1) b) To begin overtime production (S2) c)To construct new facilities (S3).The correct choice depends largely upon future demand which may be low medium or high.

Demand	Probability	S1	S2	S3
Low	0.10	10	-20	-150
Medium	0.50	50	60	20
High	0.40	50	100	200

Construct a decision tree to show the correct choice of the company. [7]

9. (a) Comment on the Reversal Test in Index Number [8]

   (b)

	Price Rs per (kg)		Quantity Sold (kg)	
	1970	1980	1970	1980
Commodity A	4	5	95	120
Commodity B	60	70	118	130
Commodity C	35	40	50	70

Construct Paasche's Price Index No from the following [7]

10. (a) Find dy/dx (y_1)

    I) $Y= 3x+4x^5+ 10x^3+108$

    ii) $Y= aLogxSinx + Cos(Logx)+5e^x$ [6]

    (b) How can Hypothesis Testing be applied for Identification of Simple Regression lines? [5]

    (c) Find dy/dx if i) y= a Sin (logx) +b CosLog (Sinx) +e2x

    ii) $3ax^5y+4axy+5xy=25$ [4]

11. (a) Explain the term Probability. [2]

    (b) State the two important laws of Probability. [2]

    (c) Construct Fisher's Ideal index number from the following.

	1960 Base Year		1968 Current Year	
Commodity	Price	Quantity	Price	Quantity
A	8	6	12	5
B	10	5	11	6
C	7	8	8	5

[6]

    (d) State Bayes Theorem of Probability. [5]