LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Com. & B.B.A. DEGREE EXAMINATION – **CORPORATE SECRE. & BUSI. ADMIN.**

THIRD SEMESTER – **APRIL 2018**

MT 3209– BASIC MATHEMATICS

Date: 04-05-2018 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

Part A

Answer ALL questions **(10 x 2 = 20)**

1. Find the Equilibrium price when $Q_d = \frac{8p}{p-2}$ and $Q_s = p^2$
2. Define Demand function.
3. If $A = \begin{pmatrix} 2 & 5 \\ 1 & 3 \end{pmatrix}, B = \begin{pmatrix} 1 & -1 \\ -1 & 2 \end{pmatrix}$ find AB.
4. State Cayley-Hamilton theorem
5. A straight line cuts the axes at the point $M(4,0)$ and $N(0,1)$. Find the length of MN.
6. Find the slope of the line joining the points $(-4,8)$ and $(8,-4)$.
7. Define Transportation problem.
8. Define correlation and its types.
9. Find the value of $(45\% \ of \ 750) - (25\% \ of \ 480)$.
10. A person walks 9 hours at a speed of 3 km per hour and again walks 6 hours at a speed of 4 km per hour. What is the average speed in km per hour ?

Part B

Answer any FIVE of the following **(5 x 8 = 40)**

11. (a) If $f(x) = x^2 + 2x - 5$, find $f(x+1) - f(x-1) + f(x+2)$.

    b). Find the equation of the straight line whose intercept on the y-axis is 6 and which passes through the point (4,-2). **(4 + 4)**

12. Prove that $\begin{vmatrix} a & b & c \\ a-b & b-c & c-a \\ b+c & c+a & a+b \end{vmatrix} = a^3 + b^3 + c^3 - 3abc.$
13. Verify Cayley-Hamilton theorem for the matrix $A = \begin{pmatrix} 1 & 2 \\ 4 & 3 \end{pmatrix}$.

14. Find the inverse of the matrix $A=\begin{bmatrix}2 & -1\\ 3 & 2\end{bmatrix}$.

15. Determine the basic feasible solution to the following transportation problem by using Least cost method.

	D1	D2	D3	SUPPLY
S1	1	2	6	7
S2	0	4	2	12
S3	3	1	5	11
DEMAND	10	10	10	

16. Calculate the mean and standard deviation from the following table giving the age distribution of 542 members.

Age in years	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Number of members	3	61	132	153	140	51	2

17. A book was sold for Rs. 27.50 with a profit of 10%. If it were sold for Rs. 25.70 then what would have been the percentage of profit or loss ?

18. Ramu was 4 times as old as his son 8 years ago. After 8 years Ramu will be twice as old as his so. What are their present ages ?

Part C

Answer any TWO questions **(2 x 20 = 40)**

19. (a) Find the equation of the straight line passing through the points $(2,3)$ and perpendicular to the line $x-2y=3$.

(b) Find the equation of the straight line which makes a negative intercept of 4 units on the x-axis and passes through the point $(2,4.5)$.

(c) Find the intercepts of the equation $x-y+1=0$ with x-axis and y-axis **(8+8+4)**

20. (a) Solve by using Crammer's rule

$10x+y+z=12,\ \ 2x+10y+z=13\ ,\ 2x+2y+10z=14$.

(b)Find the matrix B such that $A^2+3A+B=\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$, Where $A=\begin{bmatrix}3 & -2\\ -1 & 4\end{bmatrix}$ **(12 + 8)**

21. a) The assignment cost of assigning any one operator to any one machine is given in the following table.

Machine \ Operators	I	II	III	IV
A	10	5	13	15
B	3	9	18	3
C	10	7	3	2
D	5	11	9	7

Find the optimum assignment schedule.

b) Determine the basic feasible solution to the following LPP by using North-West Corner rule.

Origin \	A	B	C	D	E	Supply
P	2	11	10	3	7	4
Q	1	4	7	2	1	8
R	3	9	4	8	12	9
Demand	3	3	4	5	6	

(10 + 10)

22 (a) Two ladies were asked to rank 7 different types of lipsticks. The ranks given by them are as follows.

Lipsticks	A	B	C	D	E	F	G
Neelu	2	1	4	3	5	7	6
Neena	1	3	2	4	5	6	7

Calculate the Spearman's rank correlation.

(b) A,B and C started business by investing Rs. 1,20,000 , Rs. 1,35,000 and Rs. 1,50,000 respectively Find the share of each out of an profit of Rs. 56,700..

(c) The average weight of A,B and C is 48 kg. If the average weight of A and C is 40 kg and average weight of B and C is 43 Kg, find the weight of B. **(8 + 6 + 6)**

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