LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

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

THIRD SEMESTER – **NOVEMBER 2018**

MT 3209– BASIC MATHEMATICS

Date: 30-10-2018 Dept. No. Max. : 100 Marks

Time: 01:00-04:00

PART A

Answer ALL questions(10 ×2 = 20)

1. Define Total Revenue function.
2. Find the slope of the inclination of the line joining $(-4,8)$ and $(8,4)$.
3. If $A=\begin{bmatrix}2 & 5\\ 1 & 3\end{bmatrix}$ and $B=\begin{bmatrix}1 & -1\\ -3 & 2\end{bmatrix}$ find AB and BA.
4. State Cayley- Hamilton theorem.
5. Define Optimum solution.
6. Explain the Transportation problem.
7. What percent of 4.8 kg is 24 gm.
8. Find the value of $(45\%\text{ of }750)-(25\%\text{ of }480)$.
9. A person walks 9 hrs 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.
10. Write the formula for finding the Spearman's rank correlation.

PART B

Answer ANY FIVE questions(5 ×8 = 40)

11. a) Find the equation of the line whose intercept on the y-axis is 6 and which pass through the point $(4,-2)$

    b) Find the intercept of the equation $x+2y=3$.**(5 + 3)**

12. Prove that $\begin{vmatrix}a+b+2c & a & b\\ c & b+c+2a & b\\ c & a & c+a+2b\end{vmatrix}=2(a+b+c)^3$

13. Verify Cayley-Hamilton theorem for the matrix $A=\begin{bmatrix}1 & 2\\ 4 & 3\end{bmatrix}$.

14. Obtain the initial basic feasible solution by North-West corner rule.

	To			**Available**
From	7	3	2	2
	2	1	3	3
	3	4	6	5
Demand	4	1	5	10

15. Find the matrix B such that $A^2+3A+B=\begin{bmatrix}0 & 0\\ 0 & 0\end{bmatrix}$, where $A=\begin{bmatrix}3 & -2\\ -1 & 4\end{bmatrix}$.

16. The average weight of A,B,C is 48 kg. If the average weight of A and B be 40 kg and that of B and C is 43 kg, Find the weight of B.

17. Consider the problem of assigning five jobs to five jobs to five persons. The assignment costs are given as follows.

		Job				
		1	**2**	**3**	**4**	**5**
Persons	**A**	**8**	**4**	**2**	**6**	**1**
	B	**0**	**9**	**5**	**5**	**4**
	C	**3**	**8**	**9**	**2**	**6**
	D	**4**	**3**	**1**	**0**	**3**
	E	**9**	**5**	**8**	**9**	**5**

18. Find the standard deviation, coefficient of variation and variance.

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

PART C

Answer ANY TWO questions **(2×20 = 40)**

19. a) Find the equation of the straight line passing through the points $(2,3)$ and perpendicular to theline $x-2y=8$.

b) If $f(x)=x^2-2x+5$ find $f(x+2)-f(x+1)+f(x-1)$.

c) Define equilibrium price, Find the equilibrium price given $Q_d=\frac{8p}{p-2}$ and $Q_s=p^2$.

(8 + 8 + 4)

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

b) Solve by using Cramer's rule.

$10x+y+z=12,\quad 2x+10y+3z=13$ and $2x+2y+10z=14$. **(6+14)**

21. a) Find the solution by Least Cost Method.

		To				Supply
		D_1	D_2	D_3	D_4	
From	S_1	1	2	1	4	30
	S_2	3	3	2	1	50
	S_3	4	2	5	9	20
		20	40	30	10	

b) Solve by graphical method

$$Maximize\ z = 5x_1 + 4x_2$$

Subject to $1.5x_1 + 2.5x_2 \le 80$, $2x_1 + 1.5x_2 \le 70$, $x_1, x_2 \ge 0$ **(10 + 10)**

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

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

Calculate the Spearman's rank correlation.

b) Ramu was 4 times as old as his son 8 years ago.After 8 years,Ramu will be twice as old as his son. What are their present age.

c) A,B and C started a business by investing Rs1,20,000,Rs 1,35,000 and Rs1,50,000 respectively. Find the share of each, out of an annual profit of Rs56,700.

(10 + 5 + 5)

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