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|   |  | Name ……………………………Roll No ………………………. |

**SAINTGITS COLLEGE OF APPLIED SCIENCES**

**SECOND INTERNAL ASSESSMENT EXAMINATION, Nov2018**

**Department of Mathematics, Semester 1**

**Mathematics for Economics I**

Total : **80 marks** Time: **3Hours**

**Section A**

*Answer any 10 questions. Each question carries 2 marks.*

1. Define feasible and optimal solution of L.P.P.

2. Find x and y if $\left[\begin{matrix}\begin{matrix}4&5\end{matrix}& \\ & \end{matrix}\right]+\left[\begin{matrix}\begin{matrix}x&y\end{matrix}& \\ & \end{matrix}\right]$=$\left[\begin{matrix}\begin{matrix}-7&2\end{matrix}& \\ & \end{matrix}\right]$

3. Find the rank of the matrix $\left[\begin{matrix}\begin{matrix}5&2&1\\0&1&3\\2&1&0\end{matrix}& \\ & \end{matrix}\right]$

4. Solve the equation$4x^{2}-9=0$.

5. What do you mean by row matrix?

6. Define trace of a matrix.

7. Explain the properties of a determinant.

8. What is dual problem in linear programming?

9. What you mean by diagonal matrix.

10. Solve the equation 7x-21-3x+13=7+6x-19.

11. Define linear equation.

12. Find the determinant of $\left[\begin{matrix}\begin{matrix}2&-1&4\\4&2&2\\1&1&0\end{matrix}& \\ & \end{matrix}\right]$

 **(10 X 2 = 20 marks)**

**Section B**

*Answer any 6 questions. Each question carries 5 marks.*

13. Solve $x^{10}-33x^{5}+32=0$

14. Solve y=3(x+1), 4x=y+1

15. What are the basic assumptions in linear programming problem?

16. An animal feed company must produce at least 200 kg of a mixture consisting of ingredients x1 and x2 daily. X1 costs Rs.3 per kg. No more than 80 kg of x1 can be used and at least 60 kg of x2 must be used. Formulate a mathematical model to the problem.

17. Given A=$\left[\begin{matrix}\begin{matrix}2&2&2\\2&1&-3\\1&0&4\end{matrix}& \\ & \end{matrix}\right]$ B=$\left[\begin{matrix}\begin{matrix}3&3&3\\3&0&5\\6&9&-1\end{matrix}& \\ & \end{matrix}\right]$ C=$\left[\begin{matrix}\begin{matrix}4&4&4\\5&-1&0\\2&3&1\end{matrix}& \\ & \end{matrix}\right]$ determine 4(7A-2B-3C)

18. Write the dual of the problem

 Minimize z= x=2y

 Subject to the constraints 2x+4y≤160, x-y=30, x≥10, x,y≥0

19. Two industries I and III input output relationships are given below with final demand are given

 A=$\left[\begin{matrix}50&75\\100&50\end{matrix}\right]$ D=$\left[\begin{matrix}\begin{matrix}75\\50\end{matrix}& \\ & \end{matrix}\right]$ .If the gross output increases to $\left[\begin{matrix}\begin{matrix}400\\600\end{matrix}& \\ & \end{matrix}\right]$, determine the final demand which can be satisfied .

20 .If A=$\left[\begin{matrix}\begin{matrix}2&3&4\\5&7&9\\-2&1&1\end{matrix}& \\ & \end{matrix}\right]$ , B=$\left[\begin{matrix}\begin{matrix}4&0&5\\1&2&0\\0&3&1\end{matrix}& \\ & \end{matrix}\right]$, find$(AB)^{t}$

21. If A= $\left[\begin{matrix}\begin{matrix}-1&3&5\\1&-3&-5\\-1&3&5\end{matrix}& \\ & \end{matrix}\right]$ , find $A^{3}$

**(6 X 5 = 30marks)**

**Section C**

*Answer any 2questions. It carries 15marks.*

22. Solve the following equation by using Crammer’s rule

 3x+2y+z=6, 2x-3y+3z=2, x+y+z=3

23. Solve graphically Max z=x-2y

 Subject to –x+y≤1,3x+2y$\geq $12, 0≤x≤5, 2≤y≤4

24. Slove (i)$\frac{x-y}{2}$=$\frac{y-1}{3}$ and $\frac{3x-4y}{5}=x-10$ (ii)9x+3y-4z=35,x+y-z=4,2x-5y-4z+48=0

25.Explain the application of input output analysis.

 **(2 X 15 = 30 marks)**

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