SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act,1956)

Course & Branch :B.Arch - ARCH
Title of the Paper :Mathematics – II — Max. Marks :80
Sub. Code :321201 — Time : 3 Hours
Date :09/12/2009 — Session :FN

PART - A (8 x 4 = 32)

Answer ALL the Questions

1. Find the equation of the plane through the points (2, 2, 1), (1, -2, 3) and parallel to the x-axis.

2. Find the equation of the sphere whose centre is at (1,1,1) and which passes through the point (2,0,3).

3. What are the difference methods of a graphical presentation of data? Explain them.

4. State the properties and significance of Pearson's Correlation coefficient.

5. Define basic solution, basic feasible solution and Optimum solution of LPP.

6. Describe the method of solving unbalanced transportation problem.

7. There are five jobs each of which is to be processed through two machines M_1, M_2 in the order M_1M_2 Processing hours are as follows.

Job	1	2	3	4	5
M_1	3	8	5	7	4
M_2	4	10	6	5	8

Determine the optimal sequence for the five jobs, and minimum total elapsed time.

8. What is the difference between PERT and CPM?

PART – B (4 x 12 = 48)

Answer All the Questions

9. Find the shortest distance and equations of the line of shortest distance between the lines $\frac{x-2}{4} = \frac{y+1}{3} = \frac{z}{4}$; $2x + 3y - 5z - 6 = 0$, $3x - 2y - z + 3 = 0$.

(or)

10. Show that the plane $4x + 9y + 14z - 64 = 0$ touches the sphere $3(x^2 + y^2 + z^2) - 2x - 3y - 4z - 22 = 0$ and find the point of contact.

11. A group of eight students got the following percentage of marks in a test in Statistics and Accountancy.

Roll No	11	12	13	14	15	16	17	18
Statistics	50	60	65	70	75	40	70	80
Accountancy	80	71	60	75	90	82	70	50

Computer Correlation coefficient.

(or)

12. Height of father and sons are given in centimeters.

X: height of Father	150	152	155	157	160	161	164	166
Y: Height of Son	154	156	158	159	160	162	161	164

Find the two lines of regression and calculate the expected average height of the son when the height of the father is 154 cm.

13. Solve by Simplex method

Maximize $z = 15x_1 + 6x_2 + 9x_3 + 2x_4$

subject to the constraints: $2x_1 + x_2 + 5x_3 + 6x_4 \leq 20$

$3x_1 + x_2 + 3x_3 + 25x_4 \leq 24$

$$7x_1 + x_4 \leq 70$$
$$x_1, x_2, x_3, x_4 \geq 0$$

(or)

14. Solve the transportation problem

	1	2	3	4	Supply
I	21	16	25	13	11
II	17	18	14	23	13
III	32	27	18	41	19
Demand	6	10	12	15	

15. Solve the assignment problem

	A	B	C	D
I	1	4	6	3
II	9	7	10	9
III	4	5	11	7
IV	8	7	8	5

(or)

16. Draw the network and determine the critical path for the given data

Jobs	1-2	1-3	2-4	3-4	3-5	4-5	4-6	5-6
Duration	6	5	10	3	4	6	2	9

Find the total float, free float and independence float of each activity.