VI Semester B.C.A. Examination, June/July 2025
(NEP Scheme) (F+R)
COMPUTER APPLICATIONS
CA – E2 : a – Operations Research (Elective – II)

Time : 2½ Hours | Max. Marks : 60

Instructions : *1) Answer **all** the Sections.*
*2) Answer **any 4** questions from **each** Section.*

SECTION – A

I. Answer **any four** questions. **Each** question carries **two** marks. **(4×2=8)**

1) What is optimal solution ?

2) Define Artificial variables.

3) What is Transportation Problem ?

4) What is payoff matrix ?

5) Define maximin-minimax principle.

6) What is minimum spanning tree ?

SECTION – B

II. Answer **any four** questions. **Each** question carries **five** marks. **(4×5=20)**

7) A company manufactures two products P1 and P2. Profit per unit for P1 is Rs. 2000 and for P2 is Rs. 3000. Three raw materials M1, M2 and M3 are required. One unit of P1 needs 50 units of M1 and 100 units of M2. One unit of P2 needs 180 units of M2 and 100 units of M3. Availability is 500 units of M1, 900 units of M2 and 500 units of M3. Formulate as LPP.

8) Explain the applications of operations research.

9) Discuss Hungarian method of solving assignment problem.

10) Write principle of dominance.

P.T.O.

11) Find the solution of game theory problem using saddle point.

Player A/Player B	B_1	B_2	B_3
A_1	–2	14	–2
A_2	–5	–6	–4
A_3	–6	20	–8

12) Differentiate between PERT and CPM.

SECTION – C

III. Answer **any four** questions. **Each** question carries **eight** marks. **(4×8=32)**

13) Solve the LPP by simplex method

Maximize $z = 3x_1 + 2x_2$

Subject to constraints $2x_1 + x_2 <= 2$

$3x_1 + 4x_2 >= 12$

$x_1, x_2 >= 0.$

14) Find solution using Vogel's approximation method, also find optimal solution using modi method.

	D_1	D_2	D_3	D_4	Supply
S_1	11	13	17	14	250
S_2	16	18	14	10	300
S_3	21	24	13	10	400
Demand	200	225	275	250	

15) Consider the job of assigning 5 jobs to 5 persons. The Assignment costs are given as follows. Determine the optimum assignment schedule.

Job	I	II	III	IV	V
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

16) Solve the following game using graphical method.

3	–1	0
2	1	–1

17) Find the shortest routes between City A to City E.