

S.D.E.

B.C.A. (2004 COURSE SEM- III : WINTER - 2017
SUBJECT: COMPUTER ORIENTED DECISIONS MODELS

Day: **Thursday**
Date: **28/12/2017**

W-2017-4164

Time: **10.00 AM TO 1.00 PM**
Max. Marks: 80

N.B.:

- 1) Attempt **ANY FIVE** questions from Section-I and **ANY TWO** questions from Section – II.
- 2) Answer to both the **SECTION** should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

SECTION – I

Q.1 Explain the concept of operation research and discuss in brief its advantages and limitations. **(10)**

Q.2 Ready made garments firm manufactures two brands shirts (x) and Trauzers (Y); The product (X) and (Y). Give the profits Rs. 30.00 and Rs. 50 respectively. The products (X) and (Y) require the service of production on three machines M_1, M_2, M_3 (X) requires 1 hour on (M_1) 1 hr on (M_2) and 1 hr on (M_3) respectively. Where as Product (Y) requires 2 hrs on M_1 1hr on Machines (M_2) and 1 hr on (M_3). The time available for these machines during the year are 2000 hrs, 1500 hrs and 600 hrs respectively. Find the maximum profit by formulating this LPP and solving graphically. **(10)**

Q.3 Find the Initial basic feasible solution of the following Transportation problem to get total cost by least squares method. **(10)**

Warehouse Factory	W_1	W_2	W_3	W_4	Capacity
F_1	12	14	18	13	500
F_2	11	16	15	11	400
F_3	16	17	19	16	300
Demand	400	400	200	200	1200 1200

Q.4 Six jobs have to be done on machine (I) and then on machine (II) and machine (III) respectively. The time required by each job on each machine is given in the table. Each machine can process only one job at a time (hrs). **(10)**

Jobs Machines	J_1	J_2	J_3	J_4	J_5	J_6
M_1	10	6	5	9	8	3
M_2	5	8	7	4	8	3
M_3	1	2	1	3	13	10

Determine the sequence and idle time on the Machines for jobs so as to minimize the processing time.

P.T.O.

- Q.5** A project on construction of Bridge, with the following activities are given in (10)
following table.

Activity	1-2	1-3	1-4	2-5	3-5	4-6	5-6	6-7	5-7	
Duration (weeks)	t_o	1	3	2	1	3	2	4	6	3
	t_m	1	5	2	1	6	5	6	8	7
	t_p	7	7	8	1	9	8	14	10	11

Find:

- Draw the Project Network and duration of it.
 - Critical Path
 - S.D. and variance of activities, variance of project.
- Q.6** Solve the following L.P.P. by simplex method. (10)
- Maximize $z = 6x_1 + 3x_2$
Subject to constraints, $2x_1 + x_2 \leq 8$; $3x_1 + 2x_2 \leq 18$ $x_2 \leq 3$.
- Q.7** Write short notes on **ANY TWO** of the following: (10)
- Hungarian Method
 - Transportation Problems
 - Monte-Carlo Method for Simulation

SECTION - II

- Q.8** Obtain a IBFS by VAM and find the optimal solution by MODI-Method. (15)

Origin	D ₁	D ₂	D ₃	Supply
O ₁	2	7	4	5
O ₂	3	3	1	8
O ₃	5	4	7	7
O ₄	1	6	2	14
Demand	7	9	18	

- Q.9** Using Hungarian Method solve this A.P. the assignment cost for each operator on respective machines are given but operator (1) cannot assign M₃ and operator (3) cannot be assigned (M₄). (15)

		Machines				
		M1	M2	M3	M4	M5
Operators	O1	5	5	—	2	2
	O2	7	4	2	3	1
	O3	9	3	5	—	2
	O4	7	2	6	7	8

P.T.O.

Q.10

Past data shows the daily demand pattern for toys in the popular shop with probabilities is produced below.

Daily Demand (Number)	5	10	15	20	25	30
Probabilities	0.03	0.20	0.15	0.40	0.20	0.02

Use the following sequence of random numbers to simulate the demand by Monte-Carlo-Method for next 10 days also find the average demand of toys in that shop.

Random Numbers:

85, 23, 81, 19, 73, 29, 09, 02, 40, 11

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