SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
BBA END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - V
20UBACT5012 - Business Maths and Operations Research

Total Duration : 2 Hrs 30 Mins. **Total Marks : 60**

Section A

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. A man invested a certain sum of money at 10% simple interest. After one year he invested an equal amount at 12% simple interest when the amount in each case became Rs.1,600 he withdraw the money. How much money was invested in each case and after how many year the first one was withdrawn?
2. Find the bankers Gain on a bill of Rs.750 due in 3 years at 8% per annum.
3. A bag contains 4 white and 6 black balls. Two balls are drawn at random. What is the probability that
   a) Both are white
   b) Both are black
   c) One white and One black
4. A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $1/7$ and that of wife is $1/5$. What is the probability that
   A) Both of them will be selected
   B) Only one of them will be selected
   C) None of them will be selected
5. Assign four trucks 1,2,3 and 4 to vacant space A,B,C, D,E and F so that the distance travelled is minimized. The matrix below shows the distance.

Vacant space / Truck	1	2	3	4
A	4	7	3	7
B	8	2	5	5
C	4	9	6	9
D	7	5	4	8
E	6	3	5	4
F	6	8	7	3

Contd...

6. Draw the network for the project whose activities with their predecessor relationships are given below:
   A,C,D can start simultaneously;
   E > B, C; F, G > D; H, I >E,F; J > I,G; K > H; B > A.
7. Solve the following L.P.P by the graphical method
   Minimize Z = $3x_1 + 5x_2$
   Sub to $-3x_1 + 4x_2 \leq 12$
   $x_1 \leq 4$
   $2x_1 - x_2 \geq -2$
   $x_2 \geq 2$
   $2x_1 + 3x_2 \geq 12$
   And $x_1, x_2 \geq 0$
8. Describe about Ford and Fulkerson's Rule.

Section B

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Find the three numbers. If three numbers form an increasing G.P. If the third number is decreased by 16 we get an A.P. If then the second number is decreased by 2, we again get a G.P.
10. Solve when two symmetrical dice are thrown once. Find the Probability that the sum of the points is (i) 2 (ii) 5 or 6 (iii) More than 10 (iv) neither 7 nor 8.
11. Solve the transportation problem with unit transportation costs, demands and supplies as given below:

Source/ Destination	**D1**	**D2**	**D3**	**D4**	**Supply**
S1	6	1	9	3	70
S2	11	5	2	8	55
S3	10	12	4	7	70
Demand	85	35	50	45	

12. Calculate the earliest start, earliest finish, latest start and latest finish of each activity of the project given below and determine the critical path of the project

Activity	1-2	1-3	1-5	2-3	2-4	3-4	3-5	3-6	4-6	5-6
Duration (in weeks)	8	7	12	4	10	3	5	10	7	4

13. Solve the LPP by using simplex method
    Maximize Z = $4X_1 + 10X_2$
    Sub to $2X_1 + X_2 \leq 50$
    $2X_1 + 5X_2 \leq 100$
    $2X_1 + 3X_2 \leq 90$
    and $X_1, X_2 \geq 0$

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