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.
B.B.A. - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - V
20UBACT5012 - Business Maths and Operations Research

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

Section B

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

1. Out of 70,000 to invest for one year, a man invests Rs.30,000 at 4% and Rs. 20,000 at 3% per annum simple interest. At what rate percent, should he lend the remaining money, so that he gets 5% interest on the total amount he has?
2. 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?
3. The processing time in hours for the jobs when allocated to the different machines is indicated below. Assign the machines for the jobs so that the total processing time is minimum

		Machines				
Jobs		**M_1**	**M_2**	**M_3**	**M_4**	**M_5**
	J_1	9	22	58	11	19
	J_2	43	78	72	50	63
	J_3	41	28	91	37	45
	J_4	74	42	27	49	39
	J_5	36	11	57	22	25

4. 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**.
5. Solve the following LPP by graphical method.

   Maximize: $Z = 3X_1 + 2X_2$
   Subject to: $-2X_1 + X_2 \leq 1$
   $X_1 \leq 2$
   $X_1 + X_2 \leq 3$
   Where $X_1, X_2 \geq 0$
6. Calculate the amount and compound interest on Rs.12,000 for 1- 1/2 years at the rate of 10% per annum compounded annually.

7. State and prove Multiplicative Theorem.

8. Find the transportation using Least Cost Method.

	Demand Point				Supply
Source	1	2	1	4	**30**
	3	3	2	1	**50**
	4	2	5	9	**20**
Demand	**20**	**40**	**30**	**10**	

Section C

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

9. (a) Find the true discount and the present worth of a bill for Rs.1,660 due in 9 months at 5% per annum.
   (b) Calculate the compound interest on Rs.20,000 for 9 months at the rate of 4% per annum, when the interest is compounded quarterly.

10. State and prove Bayes theorem.

11. Solve the transportation problem by Modi. Method.

	Destination Centre				Supply
Factory	21	16	25	13	**11**
	17	18	14	23	**13**
	32	27	18	41	**19**
Demand	**6**	**10**	**12**	**15**	

12. Calculate the total float, free float and independent float for the project whose activities are given below:

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

Draw the network diagram. Find the critical path and S.D of project completion time.

13. Use simplex method to solve the LPP.
Maximize: $Z = 6X_1 + 4X_2$
Subject to: $2X_1 + 3X_2 \leq 30$
$3X_1 + 2X_2 \leq 24$
$X_1 + X_2 \leq 3$
Where $X_1, X_2 \geq 0$

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