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Reg. No.....

Name.....

B.B.A. DEGREE (SPECIAL MERCY CHANCE) EXAMINATION JANUARY 2025

Second Semester

BUSINESS STATISTICS—II

(Prior to 2009 Admissions)

Time : Three Hours Maximum Marks : 75

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. Compute $P(A/B)$, if $P(B) = 0.5$ and $P(A \cap B) = 0.32$.
2. What are the characteristics of O.R ?
3. Define slack and surplus variables in a L.P.P.
4. Explain the classical transportation problem.
5. Explain decision tree.

(5 × 3 = 15)

Part B

Answer **five** *questions.*
Each question carries 6 *marks.*

6. Bag I contains 3 red and 4 black balls while another Bag II contains 5 red and 6 black balls. One ball is drawn at random from one of the bags and it is found to be red. Find the probability that its was drawn from Bag II.
7. Explain the applications of O.R.

Turn over

8. Solve graphically the following L.P.P.

Maximize $Z = 3x_1 + 2x_2$
subject to the constraints

$$x_1 - x_2 \leq 1$$
$$x_1 + x_2 \geq 3$$
$$x_1, x_2 \geq 0.$$

9. Define the following terms :

   i) Basic variable ;

   ii) Basic solution ;

   iii) Basic feasible solution ; and

   (iv) Degenerate solution.

10. Explain the use of artificial variables in L.P.P.

11. State the transportation problem when does it have a unique solution.

12. State the assignment problem. Describe an algorithm for the solution of the assignment problem.

13. Explain Laplace criterion for analysing problems under uncertainty.

(5 × 6 = 30)

Part C

Answer any **two** *questions.*
Each question carries 15 *marks.*

14. Use two phase simplex method to solve the problem :

Maximize $Z = 3x_1 - x_2$
subject to the constraints

$$2x_1 + x_2 \geq 2$$
$$x_1 + 3x_2 \leq 2$$
$$x_2 \leq 4$$
$$x_1, x_2 \geq 0.$$

15. Determine an initial basic feasible solution to the following T.P. using :

    a) North-west corner rule ; and

    b) Vogel's approximation method.

16. Four salesman are to be assigned to four districts. Estimates of the sales revenue in hundred of rupees for each salesman are under :

	District			
Salesman	A	B	C	D
1	320	350	400	280
2	400	250	300	220
3	420	270	340	300
4	250	390	410	350

17. Solve using Big-M method :

Minimize $Z = 4x_1 + 2x_2$

subject to the constraints

$$3x_1 + x_2 \geq 27$$
$$x_1 + x_2 \geq 21$$
$$x_1 + 2x_2 \geq 30$$
$$x_1, x_2 \geq 0.$$

(2 × 15 = 30)