Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - Optimization Technique
Course Code - BCA404C

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- M.SC.(MM)
- B.A.(Eng)

Answer all the questions. Each question carry one mark.

9. 1. A shop can make two types of sweets (A and B). They use two resources – flour and sugar. To make one packet of A, they need 2 kg of flour and 5 kg of sugar. To make one packet of B, they need 3 kg of flour and 3 kg of sugar. They have 25 kg of flour and 28 kg of sugar. These sweets are sold at Rs 800 and 900 per packet respectively. Find the best product mix.An appropriate objective function for this problem is to

Mark only one oval.

- Maximize total revenue
- Minimize total cost
- Maximize the total units of products produced
- None of these

10. 2. A company makes two products (A and B) and both require processing on 2 machines. Product A takes 10 and 15 minutes on the two machines per unit and product B takes 22 and 18 minutes per unit on the two machines. Both the machines are available for 2640 minutes per week. The products are sold for Rs 200 and Rs 175 respectively per unit. Formulate a LP to maximize revenue? The market can take a maximum of 150 units of product .An appropriate objective function for this problem is to

Mark only one oval.

- Maximize total revenue
- Minimize total cost
- Maximize the total units of products produced.
- None of these

11. 3. A company makes two products (A and B) and both require processing on 2 machines. Product A takes 10 and 15 minutes on the two machines per unit and product B takes 22 and 18 minutes per unit on the two machines. Both the machines are available for 2640 minutes per week. The products are sold for Rs 200 and Rs 175 respectively per unit. Formulate a LP to maximize revenue? The market can take a maximum of 150 units of product.The number of decision variables is _____

Mark only one oval.

- 1
- 2
- 3
- 4

12. 4. An investor has Rs 20 lakhs with her and considers three schemes to invest the money for one year.The expected returns are 10%, 12% and 15% for the three schemes per year. The third scheme accepts only up to 10 lakhs. The investor wants to invest more money in scheme 1 than in scheme 2.The investor assesses the risk associated with the three schemes as 0 units, 10 units and 20 units per lakh invested and does not want her risk to exceed 500 units.Which of the following is the correct decision variable?

Mark only one oval.

- ◯ Amount of money invested in each scheme
- ◯ Amount of revenue obtained from each scheme
- ◯ Amount of risk through investment in each scheme
- ◯ Total amount that can be obtained from the investments

13. 5. An investor has Rs 20 lakhs with her and considers three schemes to invest the money for one year.The expected returns are 10%, 12% and 15% for the three schemes per year. The third scheme accepts only up to 10 lakhs. The investor wants to invest more money in scheme 1 than in scheme 2.The investor assesses the risk associated with the three schemes as 0 units, 10 units and 20 units per lakh invested and does not want her risk to exceed 500 units.How many decision variables are in your formulation?

Mark only one oval.

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

14. 6. Two tasks have to be completed and require 10 hours and 12 hours of work if one person does the tasks. If n people do task 1, the time to complete the task becomes 10/n and so on. Similarly if n people do task 2, the time becomes 12/n and so on. We have 5 people and they have to be assigned to the two tasks. We cannot assign more than three to task 1. Find the earliest time that both tasks are completed if they start at the same time. (Use ideas from the bicycle problem to write your objective function. At some point you may have to define a variable to represent the reciprocal of another variable). Formulate an LP problem and answer the following:The final objective function is

Mark only one oval.

- Maximization problem with one term in the objective function
- Minimization problem with one term in the objective function
- Maximization problem with two terms in the objective function
- Minimization problem with two terms in the objective function

15. 7. Two tasks have to be completed and require 10 hours and 12 hours of work if one person does the tasks. If n people do task 1, the time to complete the task becomes 10/n and so on. Similarly if n people do task 2, the time becomes 12/n and so on. We have 5 people and they have to be assigned to the two tasks. We cannot assign more than three to task 1. Find the earliest time that both tasks are completed if they start at the same time. (Use ideas from the bicycle problem to write your objective function. At some point you may have to define a variable to represent the reciprocal of another variable). Formulate an LP problem and answer the following:The total number of constraints in the final formulation is

Mark only one oval.

- 1
- 2
- 3
- 4

16. 8. TV sets are to be transported from three factories to three retail stores. The available quantities are 300, 400 and 500 respectively in the three factories and the requirements are 250, 350 and 500 in the three stores. They are first transported from the factories to warehouses and then sent to the retail stores. There are two warehouses and their capacities are 600 and 700 units. The unit costs of transportation from the factories to warehouses and from the warehouses to retail stores are known. Formulate an LP and answer the following questions:The objective function

Mark only one oval.

- ◯ Maximizes the total cost of transportation between factories and warehouses and between warehouses and retail stores
- ◯ Maximizes the total quantity transported between factories and warehouses and between warehouses and retail stores
- ◯ Minimizes the total cost of transportation between factories and warehouses and between warehouses and retail stores
- ◯ Minimizes the total quantity transported between factories and warehouses and between warehouses and retail stores

17. 9. Thousand answer papers have to be totaled in four hours. There are 10 regular teachers, 5 staff and 4 retired teachers who can do the job. Regular teachers can total 20 papers in an hour; staff can do 15 per hour while retired teachers can do 18 per hour. The regular teachers total the papers correctly 98% of the times while this number is 94% and 96% for staff and retired teachers. We have to use the services of at least one staff. You can assume that any person can work for a fraction of an hour also. Formulate a relevant LP problem and answer the following questions.Which of the following is a correct decision variable for this problem?

Mark only one oval.

- ◯ Number of answer papers given to teachers 1 to 10
- ◯ Total number of answer papers given to regular teachers
- ◯ Number of papers correctly totaled by regular teachers
- ◯ Number of papers incorrectly totaled by the reg

18. 10. Thousand answer papers have to be totaled in four hours. There are 10 regular teachers, 5 staff and 4 retired teachers who can do the job. Regular teachers can total 20 papers in an hour; staff can do 15 per hour while retired teachers can do 18 per hour. The regular teachers total the papers correctly 98% of the times while this number is 94% and 96% for staff and retired teachers. We have to use the services of at least one staff. You can assume that any person can work for a fraction of an hour also. Formulate a relevant LP problem and answer the following questions.A relevant objective function would be to

Mark only one oval.

- Maximize the papers totaled by all of them in four hours
- Minimize the papers totaled by staff and retired teachers
- Minimize the number of papers correctly totaled by all of them
- Minimize the number of papers incorrectly totaled by all of them

19. 11. A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.What is the correct objective function for this problem?

Mark only one oval.

- Maximize the total money available at the end of the third period
- Maximize the total money at the end of the third period less total money borrowed
- Maximize the total money at the end of the third period less total money paid back including interest
- Maximize the number of items sold at the end of the third period

20. 12. A person is in the business of buying and selling items. He has 10 units in stock and plans for the next three periods. He can buy the item at the rate of Rs 50, 55 and 58 at the beginning of periods 1, 2 and 3 and can sell them at Rs 60, 64 and 66 at the end of the three periods. He can use the money earned by selling at the end of the period to buy items at the beginning of the next period. He can buy a maximum of 200 per period. He can borrow money at the rate of 2% per period at the beginning of each period. He can borrow a maximum of Rs 8000 per period and he cannot borrow more than Rs 20000 in total. He has to pay back all the loans with interest at the end of the third period.How many decision variables are in the formulation

Mark only one oval.

- ◯ 3
- ◯ 6
- ◯ 9
- ◯ 10

21. 13. A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a “combo” which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and contains twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40, 60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions:What is the most suitable objective function for this problem?

Mark only one oval.

- ◯ Maximize the total money earned by sale
- ◯ Maximize the total money earned by sale less the cost of items bought
- ◯ Maximize the total plates made of all the items
- ◯ Minimize the unmet demand

22. 14. A food stall sells idlis, dosas and poories. A plate of idli has 2 pieces, a plate of dosa has 1 piece while a plate of poori has 2 pieces. They also sell a “combo” which has 2 idlis and 2 poories. A kg of batter costs Rs 60 and contains twelve spoons of batter. Each piece of idli requires 1 spoon of batter and each dosa requires 1.5 spoons of batter. Each poori piece requires 1 ball of wheat dough and a kg of wheat dough that costs Rs 60 can make 20 balls of dough. The selling prices of the items are Rs 40,60, 60 and 90 per plate respectively. The owner has Rs 800 with her and estimates the demand for the four items (in plates) as 50, 30, 20 and 10 respectively. There is a penalty cost of Rs 10 for any unmet plate of demand of an item. Idli being the most commonly consumed item, the owner wishes to meet at least 80% of the demand. Formulate an LP problem and answer the following questions:How many decision variables are in the formulation

Mark only one oval.

- 3
- 4
- 5
- 8

23. 15. Consider the maximum flow problem with n nodes and m arcs. You are writing a formulation with f as the maximum flow.The objective function has _____ terms

Mark only one oval.

- 1
- 2
- 3
- 4

24. 16. Consider the maximum flow problem with n nodes and m arcs. You are writing a formulation with f as the maximum flow.The total number of constraints is _____

Mark only one oval.

- m
- n
- m+n
- mn

25. 17. Consider the napkins problem where the requirement is for 20 days. There are two types of laundries – fast and slow. The fast laundry takes 2 days (napkins sent at the end of day 1 can be used on day 3) and the slow laundry takes 3 days (napkins sent at the end of day 1 can be used on day 4).The costs of the new napkins and the two laundries are known.The objective function has _____ terms

Mark only one oval.

- 54
- 55
- 56
- 57

26. 18. Consider the napkins problem where the requirement is for 20 days. There are two types of laundries – fast and slow. The fast laundry takes 2 days (napkins sent at the end of day 1 can be used on day 3) and the slow laundry takes 3 days (napkins sent at the end of day 1 can be used on day 4).The costs of the new napkins and the two laundries are known.The total number of constraints relating to the laundries is _____

Mark only one oval.

- 12
- 14
- 16
- 18

27. 19. Consider the media selection problem with n possible things to invest in. Examples could be TV, radio, newspaper etc. There is a total budget restriction and limit on investment in each.The objective function has _____ terms

Mark only one oval.

- n
- n+2
- n+1
- n-1

28. 20. Consider the media selection problem with n possible things to invest in. Examples could be TV, radio, newspaper etc. There is a total budget restriction and limit on investment in each.The number of decision variables is _____

Mark only one oval.

- n-1
- n+2
- n
- n+1

29. 21. Consider the LP problem:Maximize 7X1 + 6X2subject toX1 + X2 ≤ 42X1 + X2 ≤ 6X1,X2 ≥ 0The objective function corresponding to the optimum solution is.....

Mark only one oval.

- 24
- 26
- 28
- 30

30. 22. Consider the LP problem:Maximize 5X1 + 8X2subject to3X1 + 4X2 ≤ 125X1 + 2X2 ≤20X1, X2 ≥ 0.The objective function corresponding to the optimum solution is _____

Mark only one oval.

- 24
- 26
- 30
- 36

31. 23. A constraint that does not affect the feasible region is a

Mark only one oval.

- non-negativity constraint
- slack constraint
- redundant constraint
- standard constraint

32. 24. Consider the LP problem:Maximize 5X1 + 8X2subject to3X1 + 4X2 ≤ 165X1+2X2≤12X1, X2 ≥ 0The corner point obtained by solving 3X1+4X2=16 and 5X1+2X2=12 is

Mark only one oval.

- (8/7, 22/7)
- (7/8, 22/7)
- (8/7, 7/22)
- (7/8, 7/22)

33. 25. Consider the LP problem:Maximize 5X1 + 8X2subject to2X1 + 3X2 ≤ 82X1 + 3X2 ≥ -1X1, X2 ≥ 0.The corner point that gives the optimum solution is

Mark only one oval.

- (0,8/3)
- (8/3,0)
- (0,3/8)
- (3/8,0)

34. 26. Consider the LP problem:Maximize 7X1 + 6X2subject to X1 ≤ 4X1 - X2 ≥ 0X1, X2 ≥ 0The objective function corresponding to the optimum solution is _____

Mark only one oval.

- 48
- 49
- 51
- 52

35. 27. Consider the LP problem:Maximize 5X1 + 8X2subject to2X1 + 3X2 ≤ 82X1 + 3X2 ≤ -1X1, X2 ≥ 0.Which of the following is true?

Mark only one oval.

- The LP is unbounded
- The LP is infeasible
- The corner point (0,0) is optimum
- The corner point (4,0) is optimum

36. 28. Consider the LP problem:Minimize 5X1 + 8X2subject toX1 + X2 ≤ 6X1 + X2 ≥ 2X1 - X2≤ 2 X1 - X2 ≥ -2X1, X2 ≥ 0.The objective function value at optimum is ____

Mark only one oval.

- 6
- 7
- 8
- 10

37. 29. Consider the LP problem:Maximize 7X1 + 6X2subject to X1 + X2 ≤ 42X1 + X2 ≤ 6X1, X2 ≥ 0.Solve by algebraic method and answer the following:The number of basic solutions is _____

Mark only one oval.

- 1
- 4
- 2
- 6

38. 30. Consider the LP problem:Maximize 7X1 + 6X2subject to X1 + X2 ≤ 42X1 + X2 ≤ 6X1, X2 ≥ 0.Solve by algebraic method and answer the following:If we solve for X1 and X3 as basic and the other variables as non-basic, the value of X2is _____

Mark only one oval.

- 0
- 1
- 2
- 4

39. 31. Full form of PERT is

Mark only one oval.

- Program Estimation & Review Technique
- Project Evaluation & Review Technique
- Project Estimation & Research Technique
- Program Evaluation & Review Technique

40. 32. An activity is said to be critical activity if

Mark only one oval.

- Its free float is zero
- its total float is zero
- its independent float is zero
- its time duration is zero.

41. 33. In a PERT network, the starting vertex is a

Mark only one oval.

- burst node
- merge node
- root
- none of these.

42. 34. Let the time estimates for a particular activity be to = 6 days, tm = 8 days, tp = 10 days. Then the expected time tc is (where the symbols have their usual meanings)

Mark only one oval.

- 7 days
- 8 days
- 9 days
- 10 days

43. 35. The activity that can be delayed without affecting the execution of the immediate succeeding activity is determined by

Mark only one oval.

- ◯ total float
- ◯ free float
- ◯ independent float
- ◯ none of these

44. 36. The full form of CPM is

Mark only one oval.

- ◯ Crash project management
- ◯ Critical path management
- ◯ Critical path method
- ◯ Other

45. 37. In critical path computation the forward pass determines

Mark only one oval.

- ◯ Last occurrence time of events
- ◯ Earliest occurrence time of events
- ◯ Duration of activity
- ◯ None of these

46. 38. Let the time estimates for a particular activity be to = 5 days, tm = 7 days, tp = 9 days. Then the expected time tc is (where the symbols have their usual meanings)

Mark only one oval.

- 10 days
- 15 days
- 5 days
- 7 days

47. 39. Which of the following is not correct in respect of PERT calculations?

Mark only one oval.

- Expected time of an activity is a weighted average of three times estimates, a, m, and b with respective weights of 1, 4, and 1.
- The completion time of an activity is assumed to follow normal distribution
- The completion time of an activity is assumed to follow normal distribution.
- The sum total of variances of critical activity times gives the variance of the overall project completion time.

48. 40. Point out what is not required, While considering precedence relationships

Mark only one oval.

- All the predecessor(s) of an activity should be focussed on.
- Only immediate predecessor(s) should be focussed on.
- Redundant predecessors should be dropped.
- Care must be taken that there is no logical fault in it as may result in formation of a loop.

49. 41. It is known that in a project, an activity 4-6 has duration of six days and total float of three days. The E and L times at node 4 and 8 and 11 respectively while, at node 6, both are equal to 17. Which of the following is not a true statement about 4-6?

Mark only one oval.

- Its free float is three days.
- Its independent float is 0
- It is a critical activity.
- The ES of this activity is 8

50. 42. Which of the following is not a rule of network construction?

Mark only one oval.

- Each defined activity is represented by one and only one arrow.
- A network should have only initial and one terminal node.
- Identical initial and final nodes can identify two activities
- Only as few dummy activities should be included as is warranted

51. 43. Mark the wrong statement:

Mark only one oval.

- A project is a set of activities that can be performed in a certain logical sequence
- A network is a graphic portrayal of independency relationship among the activities of a project
- An arrow representing an activity can have any length and shape
- An activity cannot be represented by more than one arrow but an arrow can represent one or more activities.

52. 44. Mark the wrong statement:

Mark only one oval.

- Forward pass calculations yield the earliest and the latest start and finish times of various activities.
- The difference between the latest and the earliest finish times of an activity is its total float.
- Free float of an activity cannot exceed its total float.
- Determination of the earliest and the latest start time of various activities of a project is useful for proper planning of their execution

53. 45. When dealing with assignment problems in which we are assigning people to activities based on the cost, what is the Hungarian Algorithm used for?

Mark only one oval.

- To minimize cost
- To maximize cost
- To assign all of the activities to just one person
- To find more people that we can assign activities to

54. 46. How many feasible solutions does a 5 x 5 assignment problem have?

Mark only one oval.

- 5!
- 4!
- 6!
- 3!

55. 47. How many variables does the formulation of 5 x 5 assignment problem have?

Mark only one oval.

- 20
- 25
- 30
- 35

56. 48. How many constraints does a 5 x 5 assignment problem have?

Mark only one oval.

- 8
- 10
- 12
- 15

57. 49. Which of the following is not a step in Hungarian algorithm?

Mark only one oval.

- Subtract row minimum from every row
- Subtract column minimum from every column
- Draw lines through ticked rows and unticked columns
- Tick unassigned rows

58. 50. Which of the following statements is not TRUE about the Assignment problem?

Mark only one oval.

- It is a transportation problem
- The LP formulation will give binary solutions
- When solving, the cost matrix is square
- LP can give non integer solution sometimes

59. 51. Consider a transportation problem with 3 supply points and 4 demand points. The number of constraints in the formulation is

Mark only one oval.

- 3
- 6
- 7
- 10

60. 52. In a m x n balanced transportation problem the number of allocations in a non-degenerate basic feasible solution is

Mark only one oval.

- m
- n
- mn
- m+n-1

61. 53. The total cost of the optimal solution to a transportation problem

Mark only one oval.

- ◯ is calculated by multiplying the total supply (including any dummy values) by the average cost of the cells
- ◯ cannot be calculated from the information given
- ◯ can be calculated from the original non-optimal cost, by adding the savings made at each improvement
- ◯ can be calculated based only on the entries in the filled cells of the solution

62. 54. The stepping-stone method

Mark only one oval.

- ◯ is an alternative to using the northwest corner rule
- ◯ often involves tracing closed paths with a triangular shape
- ◯ is used to evaluate the cost effectiveness of shipping goods via transportation routes not currently in the solution
- ◯ is used to identify the relevant costs in a transportation problem

63. 55. In a minimization problem, a negative improvement index in a cell indicates that the

Mark only one oval.

- ◯ solution is optimal
- ◯ total cost will increase if units are reallocated to that cell
- ◯ total cost will decrease if units are reallocated to that cell
- ◯ current iteration is worse than the previous one

64. 56. An improvement index indicates

Mark only one oval.

- whether a method other than the stepping stone should be used
- whether a method other that the northwest corner rule should be used
- whether the transportation cost in the upper left-hand corner of a cell is optimal
- how much total cost would increase or decrease if a single unit was reallocated to that cell

65. 57. Solve the LP problem using Simplex algorithm Minimize 2X1 + 3X2 subject to X1 + X2 ≥ 4 X1 ≤1X1, X2 ≥ 0 using the simplex algorithm.If we add the constraint 2X1 + 3X2 ≤ 11

Mark only one oval.

- The optimum solution remains the same
- The problem becomes infeasible
- The problem becomes unbounded
- The optimum solution changes

66. 58. Solve the LP problem using Simplex algorithmMinimize 2X1 + 3X2subject to X1 + X2 ≥ 42X1+4X2 ≥ 10X1, X2 ≥ 0 using the simplex algorithm.The value of X2 at the optimum is ___

Mark only one oval.

- 0
- 1
- 2
- 4

67. 59. If a primal constraint is an equation, the corresponding dual variable is

Mark only one oval.

- bounded
- unbounded
- unrestricted
- Other

68. 60. In the optimum solution, if a primal constraint is satisfied as an equation, the valueof the corresponding dual variable is ___

Mark only one oval.

- Positive
- Negative
- Zero
- Can’t be said

69. 61. In the optimum solution, if a primal variable is basic then the corresponding dualslack value is ___

Mark only one oval.

- Positive
- Negative
- Zero
- No conclusion

70. 62. If the primal (maximization) is unbounded the corresponding dual is _____

Mark only one oval.

- bounded
- unbounded
- infeasible
- None of these

71. 63. Consider the LPMaximize 9X1 + 3X2subject to 4X1 + X2 ≤ 12 2X1 + 4X2 ≤ 22 X1, X2 ≥0. Solve the primal using the graphical method. Is a dual solution Y1 = 15/7, Y2 = 3/14optimum?

Mark only one oval.

- It is not optimum to the dual because it is not feasible to the dual
- The dual solution is feasible but not optimum because the objective function value is different from that of the primal
- It is optimum using the optimality criterion theorem
- Weak duality theorem is violated.

72. 64. Consider the LPMaximize 7X1 + X2subject to X1 + X2 ≤ 3 X1 + X2 ≥ 2 X2 ≥ 0, X1unrestricted. Which of the following is NOT TRUE about the dual?

Mark only one oval.

- The first constraint is an equation
- The second constraint is an equation
- The second variable is of ≤ type
- The dual has two variables and two constraints

73. 65. Write the LP dual to the problem.Minimize 2X1 + 3X2subject toX1 + X2 ≥ 42X1 +4X2 ≥ 10X1, X2 ≥ 0.The shadow price of the first resource is_____

Mark only one oval.

- 1
- 2
- 3
- 4

74. 66. Write the LP dual to the problem.Minimize 2X1 + 3X2subject toX1 + X2 ≥ 42X1 +4X2 ≥ 10X1, X2 ≥ 0.The shadow price of the second resource is _____

Mark only one oval.

- 0.4
- 0.5
- 0.6
- 0.8

75. 67. Consider the LPMaximize 2X1 + 3X2 + 4X3 + X4subject to X1+ 2X2 +5X3 + X4 ≤ 12.Xj ≥ 0. Solve the dual and find the optimum solution to the primal.The shadow price of the resource is _____

Mark only one oval.

- 1
- 2
- 3
- 4

76. 68. Consider the LP problem:Maximize 5X1 + 12X2subject to 2X1 + 5X2 ≤ 137X1 + 11X2 ≤ 31X1, X2 ≥ 0. Solve this problem using Simplex algorithm and answer the following:The objective function value after first iteration is ____

Mark only one oval.

- 28.8
- 30.90
- 31.2
- 3.12
- Option 11

77. 69. Consider a two variable LP problem with a minimization objective function and threeconstraints all of the ≥ type. The first constraint cuts the X1 and X2 axes at 2 and 7respectively. The second constraint cuts the two axes at 3 and 5 respectively and the third constraint at 4 and 4 respectively. The objective function is 3X1 + 2X2.Which of the following is not a valid constraint for this problem?

Mark only one oval.

- 7X1 + 2X2 ≥ 14
- 4X1 + 5X2 ≥ 20
- 5X1 + 3X2 ≥ 15
- X1 + X2 ≥ 4

78. 70. Consider a two variable LP problem with a minimization objective function and threeconstraints all of the ≥ type. The first constraint cuts the X1 and X2 axes at 2 and 7respectively. The second constraint cuts the two axes at 3 and 5 respectively and the third constraint at 4 and 4 respectively. The objective function is 3X1 + 2X2.The optimum solution to the dual is

Mark only one oval.

- Y1 = Y2 = 0
- Y1 = 2, Y2 = 0, Y3 = 0
- Y2 = Y3 = ½
- Y1 = 1/5, Y3 = 8/5