

DISTANCE LEARNING CENTRE AHMBELLO UNIVERSITY, ZARIA, NIGERIA GROUP D BUAD 802 ASSIGNMENT

2022/2023 ACADEMIC SESSION

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**GROUP ASSIGNMENT**

1. A cooperative society of farmers has 50 hectare of land to grow two crops X and Y. The profit from crops X and Y per hectare are estimated as Rs 10,500 and Rs 9,000 respectively. To control weeds, a liquid herbicide has to be used for crops X and Y at rates of 20 litres and 10 litres per hectare. Further, no more than 800 litres of herbicide should be used in order to protect fish and wildlife using a pond which collects drainage from this land. How much land should be allocated to each crop so as to maximise the total profit of the society?

**Answer:**

Let x hectares for crop **A** and y hectares for crop **B**be allocated.

|  |  |  |
| --- | --- | --- |
| **A** | **B** |  |
| X | y | 50 hectares |
| 10500 | 9000 | Profit |
| 20 L/H | 10 L/H | 800 liters at most |

We need to maximize profit given by

Z=10500x+9000y subject to

x+y≤50

20x+10y≤800

x,y≥0

After plotting graph, the corner points are

|  |  |  |
| --- | --- | --- |
| Corner Point | **Value of Z** |  |
| O(0,0) A(40,0) B(30,20) C(0,50) | Z=0  Z=420000  Z=315000+180000=495000  Z=450000 | **Maximum** |

Therefore, 30 hectares for crop A and 20 hectares for crop B are to be allocated respectively to maximize profit.

1. Using the information in the table below, assuming that the project team will work a standard working week (5 working days in 1 week) and that all tasks will start as soon as possible:

|  |  |  |  |
| --- | --- | --- | --- |
| Task | Description | Duration (Working days) | Predecessor/s |
| A | Requirement Analysis | 5 | - |
| B | Systems Design | 15 | A |
| C | Programming | 25 | B |
| D | Telecoms | 15 | B |
| E | Hardware Installation | 30 | B |
| F | Integration | 10 | C,D |
| G | System Testing | 10 | E, F |
| H | Training/Support | 5 | G |
| I | Handover and Go-Live | 5 | H |

1. Construct the network diagram and determine the critical path of the project
2. Calculate the planned duration of the project in weeks
3. Identify any non-critical tasks and the float (free slack) on each
4. **NETWORK DIAGRAM SHOWING THE CRITICAL PATH [CPA] AND CRITICAL PATH TO THE PROJECT**

5

70

70

**0**

55

65

0

55

45

10

30

35

20

55

5

25

50

20

75

0

75

70

70

0

65

65

65

55

45

55

45

45

**0**

20

45

20

20

20

5

**0**

5

5

0

0

**0**

TASK E [Hardware Installation]

30

TASK I [Hand over and Go-Live

5

TASK H [Training/Support]

5

TASK G [System Testing]

10

TASK D [Telecoms]

15

TASK C [Programming]

25

TASK A [Requirement Analysis]

5

TASK B [System Design]

15

TASK F [Integration]

10

Path 1 duration: 75 days (Task A, B, C, F, G, H and I)

Path 2 duration: 65 days (Task A, B, D, F, G, H and I)

Path 3 duration: 70 days (Task A, B, E, G, H, and I)

**The Critical Path task of the project is: Path 1: 75days (Task A, B, C, F, G, H and I)**

1. The planned duration for the project in weeks is:

Using the three-point estimation method, Where:

a = the best-case estimate

b =the worst-case estimate

m = the most likely estimate

E = Estimate.

E = (a + 4m + b / 6)

Where a = 65 days, m = 70 days, and b = 75 days.

E = (65 + 4 (70) + 75) / 6

= 420/6

= 70 days.

Converting to weeks = 14 weeks.

**Planned duration for the project in weeks is 14 weeks.**

1. **The non-critical tasks are: Tasks D & E**

**The float on each task is shown in the network diagram in (a.) above.** The tasks on critical path has a zero-slack and the non-critical tasks (D & E), have 10 & 5 as their floats.