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| **Fayoum University** | **Final Exam** | **First Year** |
| **Faculty of Engineering** | | **Management** |
| **Electrical Engineering Dept .** | **9, Jan., 2016** | **Time Allowed :2 hours** |

**Solve the following questions**

**Question One**

a) Draw a graph to show the relation between the following: inventory level, ROP, Ordered quantity, average inventory and lead time.

b) What is meant by :PERT, CPM, Gunt, Beta distribution

c) What is the differences between fixed order quantity and fixed time quantity

**Question Two**

A pen manufacturing makes two models of pens. Requirements for each lot of pen are given below.

| | Model A | Model B | Available |
|---|---|---|---|
| Plastic | 3 | 4 | 36 |
| Ink Assembly | 5 | 4 | 40 |
| Molding Time | 5 | 2 | 30 |

The profit for either model is $1000 per lot.

a. What is the linear programming model for this problem?

b. Find the optimal solution. c. Will there be excess capacity in any resource?

**Question Three**

The following table shows a number of activities for a project-:

| Act. No. | Activity name | Duration | Resources | Predecessor |
|---|---|---|---|---|
| 1 | Shelter Plate | 2 | 2 | 5 |
| 2 | Shelter Walls | 1 | 1 | 1 |
| 3 | Shelter Roof | 2 | 2 | 2,4 |
| 4 | Roof Beam | 3 | 2 | 2 |
| 5 | Excavation | 2 | 3 | -- |
| 6 | Curb and Gutter | 2 | 3 | 5 |
| 7 | Shelter Seat | 1 | 2 | 4,6 |
| 8 | Paint | 1 | 1 | 3, 7 |
| 9 | Signwork | 1 | 2 | 8 |

a) Draw a Gantt chart and PERT network for the project

b) Find the critical path and the critical time.

c) What will happen if the duration of task 4 increased by 2 days.

d) If it is desired to decrease project duration by one day, what we can do?

e) Find the slack time for each bath f) The project manager reduces the durations of tasks 3 and 7 by one day each, how will this affect the finishing date of the project?

**Question Four**

a) State the functions of inventory ? b) Drive an expression for the economic ordered quantity ?

c) In an industrial company the following information's are available:

Annual Demand =10,000 units .Days per year in average =365 day

Cost to place an order =$10 Holding cost per unit per year =10 %of cost per unit

Lead time =10 days Cost per unit =$15

Determine: i) The economic order quantity ii) The reorder point

iii) Number of orders per year vi) Time between order

Good Luck- Dr Mohamed Fahmy