

**THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF ENGINEERING TECHNOLOGY
POSTGRADUATE DIPLOMA IN TECHNOLOGY IN INDUSTRIAL ENGINEERING –
LEVEL 7**

FINAL EXAMINATION – 2007

MEX 7215 – PRODUCTION PLANNING AND MATERIALS MANAGEMENT

DATE : 21 May 2008

TIME : 0930 hrs – 1230 hrs

DURATION: Three (03) hours

005

Answer any five (05) questions. All questions carry equal marks.

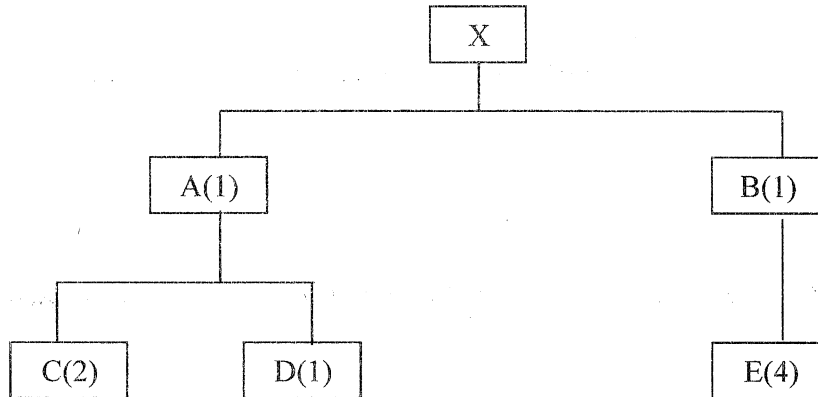
01. “In an organization buyers must obtain value. Value is a composite of the price they pay, the quality they receive, the delivery dates they obtain, and the ability of the supplier to meet the required quantities”. Evaluate this statement from a strategic point of view. (20 marks)
02. Explain why organizations commit the resources and time to evaluate supplier before making a supplier selection decision, and discuss the various methods for evaluating and selecting suppliers. (20 marks)
03. (a) Discuss the relevancy of the economic order quantity (EOQ) to inventory control. (08 marks)
- (b) The Slick Oil Company buys crude oil from a supplier that has recently offered the following quantity discounts:

Barrels ordered	Price per barrel
1-999	\$20.00
1,000-2,999	\$18.00
3,000 or more	\$17.50

If inventory carrying cost is 25 percent of the unit price and it costs \$100 for each order, regardless of order size, how many barrels should Slick order each time to satisfy its annual demand of 10,000 barrels ?

(12 marks)

04. (a) Explain the important differences between traditional inventory control systems and material requirements planning (MRP) system of inventory control. (08 marks)
- (b) The product structure tree and the inventory levels are shown below. Compute the net requirements for A, B, C, D, and E to produce 50 units of X.



Component	A	B	C	D	E
Inventory on hand and on order	20	10	15	30	100

(12 marks)

05. (a) Explain what is a multiple activity chart and state in what circumstances you would use a multiple activity chart. (10 marks)
- (b) Develop the multiple activity chart for the following situation.

The situation presented here is a common occurrence in mining industries where workers are involved in extraction of ores. Consider two points A and B in the work area. The extracted ores are first loaded on to trucks at point A. The trucks then travel up to point B where the material is automatically unloaded after which they come back to point A for further loading. Currently one worker is employed in loading trucks and the company has employed two drivers for driving the two trucks that are operating for this job. The activities involved together with their time are recorded as follows:

Activity	Time in minutes
Load a truck at point A	10
Go to point B with material	15
Unload the material at B 05	05
Return to point A	10

Suggest any possible improvements that may be made in the above situation, giving your reasons.

(10 marks)

06. (a) Compare and contrast the chase production strategy and the level production strategy. (08 marks)
- (b) A firm has developed the forecast in units for an item which has a demand influenced by seasonal factors. This demand forecast and the number of production days available per month is shown in the following table.

Month	Forecast demand	Production days
January	220	22
February	90	18
March	210	21
April	396	22
May	616	22
June	700	20
July	378	21
August	220	22
September	200	20
October	115	23
November	95	19
December	260	20

Determine the monthly inventory balances required to follow a plan of letting the inventory absorb all fluctuations in demand. In this case we have a constant work force, no idle time or overtime, no back orders, no use of subcontractors and no capacity adjustment. Assume that the firm does not use a safety stock or cushion inventory to meet demand.

If the units cost \$100 each to produce, the carrying costs per year are 20 percent of the average inventory value, and the storage costs (based on maximum inventory) are \$0.90 per unit find the cost of the above plan.

(12 marks)

07. (a) Discuss the objectives an organization is trying to achieve with facility layout. (10 marks)
- (b) Discuss the advantages and disadvantages of the basic types of layouts. (10 marks)

08. Write short notes on the following:

- (a) Just in time manufacturing
 (b) Optimized production technology (OPT)
 (c) Supply chain management
 (d) Enterprise resource planning (ERP)

(20 marks)