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The Open University of Sri Lanka
Faculty of Engineering Technology

Study Programme	:	Bachelor of Technology Honours in Engineering
Name of the Examination	:	Final Examination
Course Code and Title	:	**MEX4135 Production Management** / MEX4235
Academic Year	:	2015/2016
Date	:	10.12.2016
Time	:	0930 hrs. – 1230 hrs.
Duration	:	03 hours

General Instructions

1. Read all instructions carefully before answering questions.
2. This paper consists of 08 questions.
3. All questions carry equal marks.
4. Answer any **five (05)** Questions.
5. Write your index number in all answer pages.

Q1 a) What is forecasting? Name three types of forecasting techniques.

b) Write down the seven steps in forecasting?

c) Briefly describe the simple moving average method of forecasting.

d) Monthly demand of a product (00's of units) for the year 2015 is given in the table below:

Month	Demand
January	42
February	43
March	40
April	44
May	50
June	47
July	53
August	49
September	54
October	57
November	63
December	60

(i) Find the moving averages for three months and five months respectively.

(ii) Using three months moving average, find the forecast for January2016.

(iii) Using five months moving average, find the forecast for January 2016.

(iv) What would be the forecast for January 2016 using single exponential smoothing? The smoothing constant is 0.3 and the forecast for March was 50 units

Q2

a. What is the main purpose of Inventory control?

b. What are the two types of Inventories?

c. Why control of stock volume is desirable?

d. What are the two basic types of inventory management systems?

e. A Supplier offers an item required by a firm at the flowing rates.

Order Quantity	1-49	50-99	100-199	>200
Price per Unit (Rs)	60	50	45	40

The average yearly requirement is 1200 units. If the ordering cost is Rs.50 and the stock holding cost is Rs 10 per unit per year.

(i) What is the optimum lot size?

(ii) How frequent the orders should be placed?

(iii) Find the optimum average yearly cost.

Q3

(a) Name two scheduling techniques used in production planning.

(b) Distinguish CPM from PERT.

(c) What are the assumptions made in Critical Path Method (CPM)?

(d) Compare CPM with any other scheduling techniques.

(e) The activities involved in a publication of a book are given below. Immediate predecessor activities and normal time duration in weeks are also provided.

Activity	Activity Name	Predecessor	Time(Weeks)
A	Appraisal of book	-	9
B	Initial pricing	-	2
C	Marketability assessment	A,B	2
D	Revision by author	A	7
E	Editing the final draft	C,D	5
F	Type setting	E	4
G	Plates for art work	E	2
H	Designing of cover page	C,D	5
I	Printing and binding	F,G	6
J	Inspection and picketing	I,H	1

(i) Draw the network diagram using Activity on Arrow (AOA) method.

(ii) Find the Critical path.

(iii) Find the earliest time for launching the book

(iv) Find Earliest Start Times(EST) and Latest Finishing Times (LFT) for each activity.

(v) What is the activity which can be delayed most?

(vi) What is the duration of the delay?

Q4 a) What is the objective of Method study? Explain briefly how it is achieved.

b) What are the decisive qualities a person should have in order to be responsible for method study in an organization?

c) The time study procedure consists of series of logical steps to follow. Write down all in logical order.

d) A customer went to a shop, ordered a product and received the goods after making the payment. All activities done by the salesman is listed in the table below.The time taken for each activity for an order of one item in five successive times have been recorded as follows;

No	Job Element	Cycles observed (Minute)					Performance Rating (%)
		1	2	3	4	5	
1	Listen to the customer	2	1	2	1	6	113
2	Search the item	2	1	3	3	1	110
3	Back to customer, and get confirmation	1	2	2	1	7	115
4	Write the bill	1	6	1	2	2	120
5	Get money & pay balance with receipt	1	2	1	5	1	112
6	Deliver the good	1	1	2	1	1	105

If the allowance factor for this job is 12%,

i) Compute the normal time for the entire operation.

ii) Compute the standard time for the job.

Q5 a). Define the term quality.

b). What are the key dimensions of quality?

c). List the quality requirement of a product.

d). What is the Quality life cycle of a product? Describe with a help of a diagram.

e). Quality inspections have to be carried out mainly in three stages. Describe them briefly.

f) A sample size of 20 is drawn from a batch. If the actual percentage of defectives in the batch is 5% and the acceptable number of defectives is 1 or less, find the probability of finding one or less defectives in the sample.

g). What is Total Quality Management (TQM)? Write down the seven concepts of TQM.

h) What are the seven tools of TQM?

i). Statistical process control chart is one of the TQM tools. Describe how it works.

Q6 Three Factories P, Q and R are located in different locations and it is required to transport products to three Stores A,B and C in other three locations with minimum transportation cost. Unit costs of transportation is given (Rs) in the table below.

	P	Q	R
A	10	8	7
B	6	7	8
C	6	10	9

Capacities of Factories and Stores are given in number of units in the tables below.

Factory	Capacity(Units)
A	2000
B	3000
C	5000

Stores	Capacity(Units)
P	4000
Q	3500
R	2500

Find the transportation cost using,

a) North West Rule

b) Least cost method

c) MODI method or Vogal Approximation Method

d) What is the optimum transportation cost?

e) Show the distribution of goods in each location.

Q7 a. Describe the terms Scarcity, Choice and Scale of preference.

b. Distinguish Opportunity cost from sunk cost.

c. Discuss the pros and cons of free economy, state planned economy and mixed economy.

d. Explain the terms free goods and economic goods.

e. Write down five main causes of changes in demand of any commodity and describe one of them in detail.

f. Explain the term price elasticity of demand.

g. Discuss how it affects the customer and the supplier when the direct tax is imposed on any commodity if the demand is;

(i) Perfectly inelastic ($\eta=0$)
(ii) Perfectly elastic(η = infinity)
(iii) Unitary elastic ($\eta=1$)

Q8 a. Define the term cost centers.

b. Name three (03) cost centers and describe one of them.

c. Write short notes on
(i) costing methods
(ii) costing principles
(ii) costing techniques

d. Write down three methods of calculating depreciation

e. A car is imported at a price of Rs. 25,00000.00. If the depreciation rate is 10% what is the book value of the car after 05 years? Use the reducing balance method.

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