

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Mechanical Engineering

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Study Programme	: Bachelor of Technology Honours in Engineering
Name of the Examination	: Final Examination
Course Code and Title	: DMM5836 / MEM5336 Management for Engineers
Academic Year	: 2017/18
Date	: 27 th January 2019
Time	: 1330-1630 hrs

General Instructions

1. Read all instructions carefully before answering the questions.
2. Answer for each question should commence from a new page.
3. This is a Closed Book Test (CBT).
4. Answers should be in clear hand writing.
5. Do not use Red colour pen.

THIS QUESTION PAPER HAS TWO SECTIONS, SECTION A AND B. ANSWER ANY FIVE PARTS FROM SECTION A AND FIVE QUESTIONS FROM SECTION B.

SECTION A

- | | |
|---|----------------|
| (a) Henry Fayol laid down several principles for effective management. State four of such principles. | 4 marks |
| (b) Categorize the basic theories of motivation into two groups and briefly explain them. | 4 marks |
| (c) List the key elements of management and explain each of them briefly. | 4 marks |
| (d) Differentiate Human Resource Management (HRM) from Human Resource Development (HRD). | 4 marks |
| (e) How does a "Job description" differ from a "Job specification"? | 4 marks |

- (f) Briefly explain the chain of events that took place during industrial revolution. 4 marks
- (g) What are the four different methods of market segmentation? 4 marks
- (h) Briefly explain why the Taylor's principles would work well in industries in Sri Lanka. 4 marks

SECTION B

- Q1 (a) What is the role of an organizational structure? 4 marks
- (b) What are the key elements to be considered when designing an organizational structure for an organization? Briefly explain each element. 4 marks
- (c) What are the two main types of organizational structures? Explain them briefly. 4 marks
- (d) List the advantages and disadvantages of one of the organizational structures mentioned in Part(c) above. 4 marks
- Q2 (a) Discuss how leadership differs from management indicating the functions of leadership of an organization. 4 marks
- (b) What are the main approaches to identify leaders in an organization? Discuss briefly elements of each approach. 4 marks
- (c) State three types of Leadership styles. Explain each of them briefly. 4 marks
- (d) Discuss the merits and the demerits of leadership styles mentioned in part (C) above. 4 marks
Which one of them do you prefer? Give reasons for your choice.
- Q3 (a) Explain briefly, what "marketing" is? (4 marks)
- (b) Differentiate between Monopoly and Monopolistic competition in marketing. (4 marks)
- (c) What are the main factors to be considered in setting the price of a product? (4 marks)
- (d) Briefly explain how Break Even analysis is used in pricing products. (4 marks)

Q4 (a) Explain the importance of activity network analysis as a planning tool in project management.

(b) A certain project consists of activities labeled as A through M. The following Table gives the estimated time duration for each activity with preceding activities needed to be completed before the commencement of it.

Activity	Duration (Weeks)	Preceding activities
A	4	-
B	2	A
C	6	A
D	4	A
E	3	A
F	6	E
G	4	D
H	5	B
I	3	C, H
J	4	C, H
K	6	I
L	3	G, F
M	8	J, K, L

(i) Construct the activity network diagram and find out earliest and latest event times related to all the activities.

7 marks

(ii) What are the critical activities and the project duration?

3 marks

(iii) What is the maximum delay that can be allowed in activity L that will not affect the project duration time?

3 marks

Q5 (a) Explain the following with particular reference to costing.

4 marks

(i) Contribution

(ii) Break-even point

(iii) Variable cost

(iv) Margin of safety in terms of Rupees and volume of sales

(b) A factory manufacturing fans has a capacity of producing 300 fans per month. Variable cost of a fan is Rs. 5000/- which is sold for Rs. 6,000/- . Fixed overhead cost is Rs. 120,000/-per month. Find the following.

(i) Contribution

3 marks

(ii) Break-even point

3 marks

(iii) If the amount of fans sold is 90% of the capacity what would be the profit?

3 marks

(iv) Margin of safety in terms of Rupees and sales volume.

3 marks

- Q6 (a) Explain the situations where “Transportation method” could be used as a tool in management decision making.

- (b) Four markets M1, M2, M3 and M4 are to be supplied with a certain product from three production plants, P1, P2, and P3. The costs involved in supplying the product from the plant to the markets are given in the Table below. Also given in the Table are the demand from different markets and the amounts the each plant can supply.

		Markets				Supply
		M1	M2	M3	M4	
Plant	P1	7	3	8	6	60
	P2	4	2	5	10	100
	P3	2	6	5	1	40
Demand		20	50	50	80	

Determine the following.

- (i) Initial feasible distribution schedule indicating the method you used to obtain the solution. **7 marks**
- (ii) Distribution schedule for minimum total cost indicating the optimization method used. **5 marks**

- Q7 (a) Explain the benefits of implementing an Inventory Control System in a manufacturing organization. **3 marks**

- (b) In a lot size model, average yearly variable cost is given by,

$$K = \frac{A\lambda}{Q} + \frac{IQ}{2} + Is$$

Where,

K = Cost per year

Q = Lot size

λ = Demand units/year

A = Setting up cost

I = Inventory cost / unit / year

s = Minimum stock level

Show the followings.

- (i) K is minimum when, $Q^* = \sqrt{\frac{2\lambda A}{I}}$ **2 marks**
- (ii) Minimum value of $K^* = \sqrt{2\lambda AI}$ **2 marks**
- (iii) The variation between K and Q in a graph. **2 marks**

- (c) Lanka Metal Co. has a contract with Railway to provide 150,000 bushes a year. Lanka Metal Co. orders Metal parts for bushing in lots of 40,000 units from a supplier. It costs Rs.8,000 to place the order and estimated carrying charge is Rs. 30 which is 20% of the unit cost.
- (i) What will be the optimum order quantity? **4 marks**
- (ii) What percentage of the order quantity varies from the optimum quantity? **3 marks**

- Q8 (a) Distinguish Trial Balance from Balance sheet in accounting systems. **3 marks**
- (b) The following Trial Balance was extracted from ABC company accounts as at 31st December 2017.

	Debit (Rs)	Credit (Rs)
Capital		30,000
Drawings	5,000	
Purchases	40,000	
Carriage outwards	500	
Purchases returns		1,000
Sundry expenses	800	
Bad debts	300	
Sales		60,000
Postage	200	
Wages	1,000	
Bills payable		3,000
Discount paid	500	
Land and buildings	18,000	
Plant and machinery	7,500	
Creditors		8,500
Debtors	10,500	
Salary	1,500	
Investments	3,000	
Opening stock	13,200	
Cash	500	
	102,500	102,500

The following adjustments are to be considered.

Closing stock on 31st December 2017 is Rs10,300

Create reserve for debtors at 5%

Depreciation on Plant and Machinery at 6%

Salary outstanding is Rs.400

Interest on investment accrued is Rs.90

Wages paid in advance is Rs.50

Prepare the following.

- (i) Profit and Loss account for the year ended 31st December 2017. **7 marks**
- (ii) The Balance sheet as at that date. **6 marks**

