D 41368

EIGHTH SEMESTER B.TECH. (ENGINEERING) [2014 SCHEME] DEGREE EXAMINATION, APRIL 2018

Mechanical Engineering

ME 14 803—OPERATIONS MANAGEMENT

Time : Three Hours

Maximum : 100 Marks

Part A

Answer any **eight** *questions.*

1. Discuss about classification of production system with examples.

2. Define productivity. List five strategies for improving the productivity.

3. Discuss about any five general factors influencing plant location.

4. List any five important principles of material handling.

5. Distinguish between purchase management and store management

6. Alpha industry estimates that it will sell 12,000 units of its product for the forthcoming year. The order cost is Rs 100/order and the carrying cost/unit/year is 20% of the purchase price/unit. The purchase price/unit is Rs 50. Determine EOQ, Number of orders/year and time between successive orders.

7. Discuss about the basic reason for replacement.

8. Describe in detail about primary rules for constructing AOA diagram.

9. Discuss about the general guideline for network crashing.

10. What do you mean by bill of materials structure? Give an example.

$$(8 \times 5 = 40 \text{ marks})$$

Part B

Answer **all** *questions.*

11. The super snow paint shop has recorded the demand for particular colour during the past 6 weeks as shown in table 1 below :

Table 1

Week	Demand (Litre)
1st Week May	19
2nd Week May	17
3rd Week May	22
4th Week May	27
1st Week June	29
2nd Week June	33

Turn over

(a) Calculate a weighted average forecast for the data, using a weight of 0.6 for the most recent data and weight of 0.3 and 0.1 for successive older data.

(b) Calculate a 3 week moving average for the data to forecast demand for the next week.

Or

12. The following table 2 represents sales data for litres of milk (in hundreds) sold by a milk booth.

Table 2

Month	1	2	3	4	5	6	7	8	9	10	11	12
Sales	96	106	92	114	108	98	99	115	106	91	102	99

(a) Use single exponential smoothing to forecast demand with α of 0.20 and an initial forecast of 100.

(b) Use trend adjustment exponential smoothing to forecast sales through period 13 for the following data. Use α of 0.3, β of 0.50, an initial base of 29 and a trend of 1.0.

13. Explain in detail about the steps of product design.

Or

14. What is master production scheduling ? Explain it with an example.

15. Annual demand for an item is 5400 units. Ordering cost is Rs. 600/order. Inventory carrying cost is 30% of purchase price/unit/year. The price breaks are as shown table 3.

Table 3

Quantity	Price (Rs)
$0 < Q_1 < 2400$	12
$2400 < Q_2 < 3000$	10
$3000 \leq Q_3$	8

(a) Find the optimal order size.

(b) If the order cost is changed to Rs. 300/order. Find the optimal order size.

Or

16. What are the types of model of inventory system ? Explain any two inventory model.

17. The activities involve in alpha garment manufacturing company are listed below (table 4) with their estimate. Determine the critical path and project completion time.

Table 4

Activity	Description Predecessor(s)	Immediate	Duration (days)
A	Forecast sales volume	-	10
B	Study competitive market	-	7
C	Design item & facilities	A	5
D	Prepare production plan	C	3
E	Estimate cost of production	D	2
F	Set sales price	B,E	1
G	Prepare budget	F	14

Or

18. Consider the following data shown in table 5 summarizing the detail of a project involving 14 activities.

Table 5

Project details		
Activity	Immediate Predecessor(s)	Duration (Month)
A	-	2
B	-	6
C	-	4
D	B	3
E	A	6
F	A	8
G	B	3
H	C,D	7
I	C	2
J	E	5
K	F,G,H	4
L	F,G,H	3
M	I	13
N	K	7

(a) Determine the critical path.

(b) Determine project completion time.

(4 × 15 = 60 marks)