

Industrial Management

Time: Three hours

Full marks: 100

Answer any five questions

(All Parts Of Any One Question Must Be Answered Together)

1.a) Fit a straight line trend to the following data on demand of steel ingots (in million tonne) and project the demand for the year 2016.

Year: 2009 2010 2011 2012 2013 2014 2015

Demand: 80 84 90 93 98 100 104 (10)

b) Write the comparison of Transportation and assignment models (05)

c) Summarize Henry Fayol's contribution in the Administrative School of Management Thought. (05)

2.a) The company XYZ has an annual demand of 4,000 units of an item. The cost of each item is Rs. 90. The cost of placing an order is Rs. 25 and the inventory carrying cost is Rs. 9. Assume 250 working days per year. Determine

- i. EOQ
- ii. Optimal number of orders per year
- iii. The optimal order cycle time
- iv. Average inventory level if the EOQ is used.
- v. Total cost comprising total annual ordering cost and the carrying cost if the EOQ is used.

(b) Derive the formula of the EOQ you use in part (a).

(c) What is the purpose of the ABC classification system? 10 + 5 + 5

3(a) Use Johnson's rule to find the optimum sequence for processing the jobs shown through two work centres in flow shop scheduling. Times at each centre are in hours.

Job	A	B	C	D	E	F	G
Work Centre 1	6	8	18	15	16	6	10
Work centre 2	12	7	9	10	8	8	5

Compute the throughput time for the optimum sequence of jobs obtained in part (a) and the corresponding idle time at the two work centres.

3.b) At a petrol pump, vehicles arrive at a mean rate of 25 per hour. A vehicle, on an average, takes two minutes in taking the petrol. The arrival rate and service time rate are

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assumed to follow Poisson and exponential distribution respectively and there is only one booth for providing the petrol.

Find out the mean time a vehicle will have to wait in the queue for getting the petrol.

What other information you can obtain by analyzing the above queuing system?

10+ 10

- 4 a) The manager of an oil refinery must decide on the optimal mix of two possible blending processes of which the inputs and outputs per production run are as follows:

Process (units)	Input (units)		Output (units)	
	Grade A	Grade B	Gasoline X	Gasoline Y
1	5	3	5	8
2	4	5	4	4

The maximum amounts available of crudes A and B are 200 units and 150 units respectively. Market requirements show that at least 100 units of gasoline X and 80 units of gasoline Y must be produced. The profits per production run for process 1 and process 2 are Rs. 300 and Rs. 400 respectively. Formulate this problem as an LP model.

- (b) Determine an initial basic feasible solution to the following transportation problem by using Vogel's approximation method. **10 + 10**

		Destination				Supply
		D1	D2	D3	D4	
Source	S1	1	2	1	4	30
	S2	3	3	2	1	30
	S3	4	2	5	9	40
Demand		20	40	30	10	

5a) Explain Matrix type of organization with example.

b) Explain the concept of Production Planning and Control.

(c) What is process layout? Explain its disadvantages.

10+5+5

6.(a) Explain different strategies of maintenance management?

(b) Discuss different recording aids used in Method Study.

(c) Godavari Electric Ltd. wanted to set up a new plant for manufacturing industrial heaters. The management of Godavari Electricals identified Kakinada, Vijayavada, and