Code No: 156CQ **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February - 2023
PRODUCTION PLANNING AND CONTROL
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) The table below indicates the monthly demand for the six months period for a product.

Month	1	2	3	4	5	6
Demand(Units)	125	130	105	145	115	130

Determine the sales forecast for the 7 th month, using a 3 month simple moving average method. [2]

b) How can one evaluate the Production Planning and Control (PPC) function? [3]

c) Distinguish between Independent and Dependent demand in inventory management. [2]

d) Distinguish between in-process inventory, safety stock inventory and seasonal inventory. [3]

e) Distinguish between pure and mixed strategies in production planning. [2]

f) Explain briefly the Just-in-time inventory system (JIT). [3]

g) What is Line of Balance (LOB)? [2]

h) Distinguish between finite and infinite loading and forward and backward scheduling. [3]

i) Explain the main activities of a dispatcher. [2]

j) Comment upon the significance of material follow-up role of the purchase department. [3]

PART – B

(50 Marks)

2.a) Explain diagrammatically the production/operations management cycle.

b) Explain the levels of production planning in detail. [5+5]

OR

3.a) Discuss the steps in the Delphi method of forecasting.

b) XYZ company used simple exponential method using an exponential smoothing constant of 0.25 to forecast the short term demand. The forecast for the month of January was 1,000 units whereas the actual sales were only 900 units. What is the forecast for the month of August? [4+6]

4.a) Briefly explain VED analysis.

b) Magnum Enterprises requires 90,000 units of a certain item annually. It costs Rs.3 per unit. The cost per purchase order is Rs.300 and the inventory carrying cost is Rs.20 percent per year.

i) What is the EOQ if there is no discount?

ii) What should the firm do if the supplier offers discounts as below? [4+6]

Order quantity	Discount(%)
4,500-5,999	2
6,000 and above	3

OR

5. Pranit Engineering Contractors (PEC) creates six-month "rolling" schedules which are recomputed monthly. For competitive reasons PEC does not subcontract. Therefore, its only options to meet customer requirements are (a) work on regular time; (b) work on over time, which is limited to 30 percent of regular time; (c) do customers' work early, which would cost an additional Rs. 50 per hour per month.; and (d) perform customers' work late, which would cost an additional Rs. 100 per month penalty, as provided by their contract. PEC has 25 engineers on its staff at an hourly rate of Rs.300.The overtime rate is Rs.450. Customers' hourly requirements for the six months from January to June are:

January	February	March	April	May	June
5,000	4,000	6,000	6,000	5,000	4,000

Develop an aggregate plan using a spreadsheet. Assume 20 working days in each month. [10]

6. The following tasks must be performed on an assembly line in the sequence and times specified.

Task	Task time(Seconds)	Immediate predecessor
A	50	-
B	40	-
C	20	A
D	45	c
E	20	C
F	25	D
G	10	E
H	35	B,F,G

a) Draw the schematic diagram.

b) What is the theoretical minimum number of stations required to meet a forecast demand of 400 units per eight-hour day?

c) Use the longest-task-time and balance the line in the minimum number of stations to produce 400 units per day. [10]

OR

7.a) Explain the use of route sheet as a common production management tool.

b) How is an operation and route sheet different from a process flow chart? Explain taking a suitable example. [5+5]

8.a) What do you understand by scheduling? Discuss the different approaches to scheduling.

b) There are six jobs which must go through two machines A and B in the order AB. Processing time in hours is given here:

Jobs	**1**	**2**	**3**	**4**	**5**	**6**
Machine A	8	10	11	12	16	20
Machine B	7	5	0	14	3	9

Obtain the optimal sequence of the jobs and the elapsed time. [5+5]

OR

9.a) Distinguish between Loading and Dispatching.

b) Explain the following single criterion sequencing rules in detail.
i) FCFS ii) SPT iii) EDD iv) LPT [5+5]

10. Discuss in detail the dispatching procedures and various forms used in dispatching. [10]

OR

11.a) How does the expediting function play a crucial role in keeping the job moving through the production facility on time?

b) Discuss the applications of computers in planning and control. [5+5]

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