Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

M.Tech. Winter 2017 - 18 Examination

Semester: 1 **Date: 02/01/2018**
Subject Code: 03218103 **Time: 02.00 pm to 4.30 pm**
Subject Name: Analysis of Manufacturing Systems **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Explain Purchase model with instantaneous replenishment and without shortages. **(05)**
B) What is line balancing? Which are the various terminologies associated with line balancing? **(05)**
C) Draw and Explain PLC curve of any one product. **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**
A) Explain the concept of KANBAN system with suitable example.
B) Explain two bin inventory control system in detail.
C)"The best inventory is no inventory" support your answer with justification.
D) Consider the following single machine scheduling problem with weight. Determine the sequence which will minimize the weighted mean flow time of the problem. Also find weighted mean flow time.

Job(j)	1	2	3	4	5
Processing time (t_j)	15	4	5	14	8
Weight (w_j)	1	2	1	2	3

Q.3 A) List the quantitative and qualitative forecasting methods and explain one of each in detail. **(07)**
B) The demand for an item is Rs.18000 /year. Its production rate is 3000 units /month. The carrying cost is Rs. 0.15/unit/month and the set up cost is Rs.500/set-up. The shortage cost is Rs.20/unit/year. Find the Economic batch quantity, Maximum Inventory, maximum stock out, Cycle time, Inventory period and shortage period. **(08)**

OR

B) Enlist inventory related costs and explain each in brief. **(08)**
(07)

Q.4 A) The MPS to manufacture fire extinguisher is given in table. The details of bill of materials along with economic order quantity and stock on hand for the final product and subassemblies are shown in other table. Complete the Material Requirement Plan for the fire extinguisher, cylinder, valve assembly, valve, vlave housing, and handle bars Show what quantities of orders must be released in order to satisfy MPS.

Master production schedule

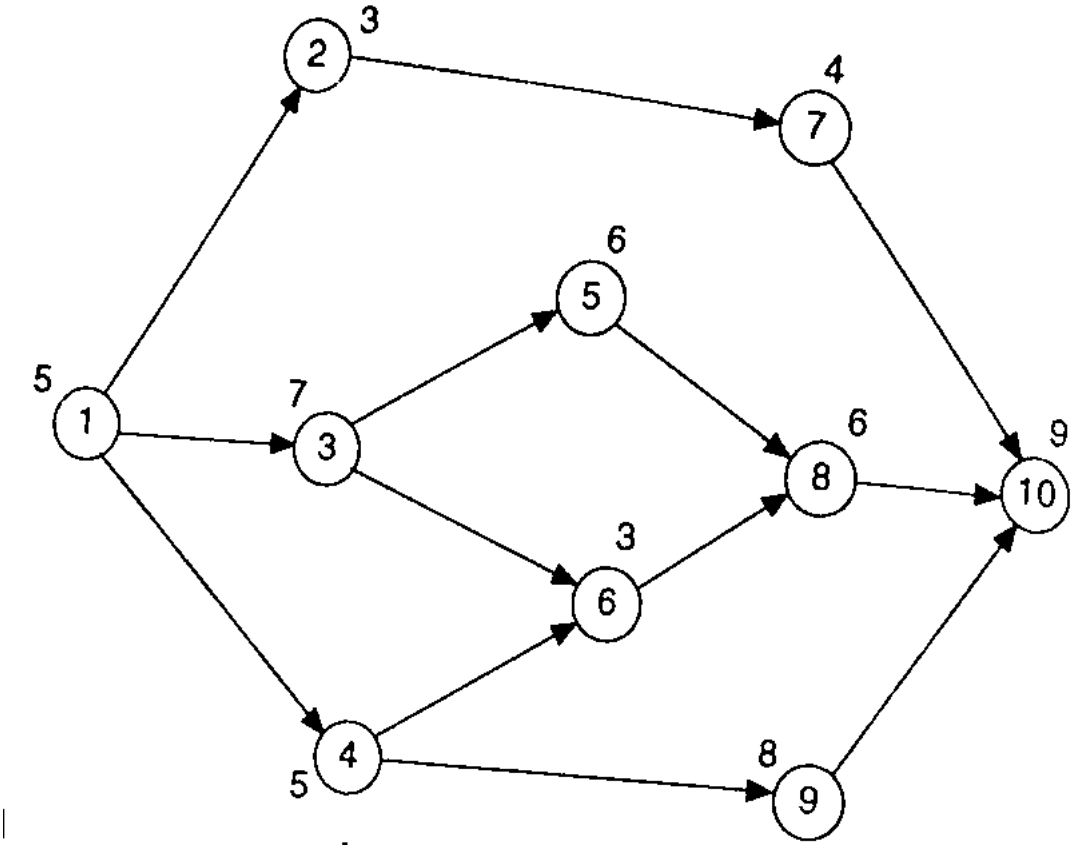
Week	1	2	3	4	5	6	7	8
Demand	100		150	140	200	140		300

Bill of Material

Parts required	Order Qty.	No. of Units	Lead time(week)	Stock on hand
Fire extinguisher	300	1	1	150
Cylinder	450	1	2	350
Valve assembly	400	1	1	325
Valve	350	1	1	150
Valve housing	450	1	1	350
Handle bars	700	2	1	650

OR

A) Consider the assembly network shown in the following figure. It shows the precedence relationships in the assembling a product. The number by the side of each node represents the processing time in minutes. The required production volume in 8 – hour shift is 24 completed assemblies. Design an assembly line using RPW method. **(07)**



B) Enlist four stages of product life cycle and explain it with figure. **(08)**