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## GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, November – 2021

(Seventh Semester)

**BMEPC7010 – INDUSTRIAL ENGINEERING**

(Mechanical Engineering)

Time: 3 hrs

Maximum: 100 Marks

**Answer ALL Questions****The figures in the right hand margin indicate marks.****PART – A: (Multiple Choice Questions)****(2 x 10 =20 Marks)****Q.1. Answer ALL questions**

- |  | [CO#] | [PO#] |
|--|-------|-------|
| a. In process charts, the symbol used for storage is<br>(i) Circle (ii) Square<br>(iii) Arrow (iv) Triangle  | CO1   | PO1   |
| b. PMTS stands for _____<br>(i) Predetermined monitoring time system (ii) Predetermined motion time system<br>(iii) Productive motion time system (iv) All of these                          | CO1   | PO1   |
| c. The ship building industry commonly employs _____ layout.<br>(i) Process (ii) Product<br>(iii) Fixed position (iv) GT   | CO2   | PO1   |
| d. _____ layout is used when machines and auxiliary services are located according to the processing sequence of the product.<br>(i) Process (ii) Product<br>(iii) Fixed position (iv) GT    | CO2   | PO1   |
| e. In _____ model, the price per unit changes with respect to the quantity of purchase.<br>(i) Quantity appreciation (ii) Quantity discount<br>(iii) Simple (iv) Manufacturing               | CO3   | PO1   |
| f. Aggregate planning is capacity planning for<br>(i) the intermediate range (ii) the long range<br>(iii) the short range (iv) none of the above   | CO3   | PO1   |
| g. Keeping production at essentially a constant rate is known as<br>(i) aggregate plan (ii) master schedule<br>(iii) level plan (iv) chase plan  | CO2   | PO1   |
| h. The time period between placing an order its receipt in stock is known as<br>(i) lead time (ii) carrying time<br>(iii) shortage time (iv) over time                                       | CO3   | PO1   |
| i. In _____, an attempt will be made to reduce the project completion time earlier than the project completion time.<br>(i) CPM (ii) PERT<br>(iii) Project crashing (iv) Resource allocation | CO4   | PO1   |
| j. The JIT production system employs the _____ in connection with movement of material.<br>(i) Pull system (ii) Push system<br>(iii) Neutral system (iv) None of the above                   | CO4   | PO1   |

**PART – B: (Short Answer Questions)****(2 x 10 = 20 Marks)****Q.2. Answer ALL questions**

- |  | [CO#] | [PO#] |
|--|-------|-------|
| a. State the different steps in method study.                              | CO1   | PO1   |
| b. Write short notes on product life cycle.                                | CO1   | PO1   |
| c. Describe the steps involve in product development.                      | CO1   | PO1   |
| d. What is multiple activity chart?  | CO1   | PO1   |
| e. Write expression for determining forecast error.                        | CO2   | PO1   |
| f. What is Aggregate Planning?   | CO3   | PO1   |
| g. State different sequencing rules for single machine and n job problems. | CO3   | PO1   |
| h. What are the relevant costs of inventory system?                        | CO3   | PO1   |

- i. What is ABC classification? CO3 PO1  
j. State the importance of safety stock in the inventory. CO3 PO1

### PART – C: (Long Answer Questions)

(15 x 4 = 60 Marks)

Answer **ALL** questions

3. a. Explain about the different process technologies. Marks 5 [CO#] CO1 [PO#] PO1  
b. What is time study? Explain the steps involved in time study for the calculation of standard time through stopwatch time study technique. . Marks 10 [CO#] CO1 [PO#] PO1

(OR)

- c. The super Snow paint shop has recorded the demand for a particular colour during the past 6 weeks as shown below. Marks 10 [CO#] CO2 [PO#] PO2

Week	1	2	3	4	5	6
Demand in Liter	19	17	22	27	29	33

- (a) Calculate a 3-week moving average for the data to forecast demand for the next week.  
(b) Calculate weighted average forecast for the data, using a weight of 0.6 for the most recent data and weights of 0.3 and 0.1 for successive older data.  
d. State and explain different plant layouts with examples. Marks 5 [CO#] CO2 [PO#] PO1  
4. a. Derive the EOQ formula for the purchase model without shortage and state the assumptions. Marks 5 [CO#] CO3 [PO#] PO1  
b. Tridev industries estimate that they will purchase 12000 units of product for the forthcoming year. The ordering cost is Rs. 100 per order and the carrying cost per unit per year is 20% of the purchase price per unit. The purchase per unit is Rs. 50, find a) economic order quantity, b) number of orders per year, c) time between successive orders. Marks 10 [CO#] CO3 [PO#] PO2  
(OR)  
c. Describe about chase plan and level plan in aggregate planning. Marks 10 [CO#] CO3 [PO#] PO1  
d. Write Short notes on P-type and Q-type inventory system. Marks 5 [CO#] CO3 [PO#] PO1  
5. a. Consider the following 3 machines and 5 jobs flow shop problem. Find the optimal sequence and the total completion time. Marks 10 [CO#] CO4 [PO#] PO2

JOB:	1	2	3	4	5
M1:	8	10	6	7	8
M2:	5	6	2	3	4
M3:	4	9	8	6	5

- b. Explain about different inputs required for MRP System? Marks 5 [CO#] CO3 [PO#] PO1  
(OR)  
c. State the differences between PERT and CPM Marks 5 [CO#] CO4 [PO#] PO1  
d. What are the factors influencing the plant and warehouse locations selection? Explain any one facility location selection model. Marks 10 [CO#] CO2 [PO#] PO1  
6. a. A small engineering project consists of 9 activities. Three time estimates for each activity are given in table. Marks 15 [CO#] CO4 [PO#] PO2

Activity → Time(↓)	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
T <sub>0</sub>	2	2	5	1	5	2	3	2	7
T <sub>m</sub>	5	5	11	4	11	5	9	2	13
T <sub>p</sub>	14	8	29	7	17	14	27	8	31

(OR)

- b. . Write short notes on following manufacturing trends: Marks 15 [CO#] CO4 [PO#] PO1  
(i) JIT  
(ii) TQM  
(iii) FMS

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