1T01417 - B.E.(MECHANICAL)(Sem VII) (CBSGS) / 42804 - Production Planning & Control

(3 Hours) **Total Marks: 80**

N.B. 1) Question No.1 is compulsory.
2) Attempt any three questions out of the remaining five questions.
3) Figures to the right indicate full marks.
4) Assume suitable data wherever required but justify the same.

Q1. Attempt any four

A. What is the status of PPC dept. depending upon the company's manufacturing processes? **(5)**

B. What do you understand by degree of centralization? **(5)**

C. What are ordering cost and inventory carrying cost? Explain the relationship between the two with the help of a neat sketch. **(5)**

D. List down the details which a process sheet should contain. **(5)**

E. Define the term dummy activity with respect to network diag. with the help of an example. **(5)**

Q2. A. Illustrate different manufacturing methods. Give characteristics with one example of each. **(10)**

B. What do you understand by work order and subsidiary order? What are the rules for raising the work order? **(10)**

Q3. A. An automobile manufacturer purchases 2400 castings over a period of 360 days. This requirement is fixed and known. These castings are subject to quantity discounts. Ordering cost is Rs. 70,000/order and storage cost per day is 0.12% of the unit cost. Determine the optimal purchase quantity if the supplier has offered the following unit prices for the castings. **(10)**
Unit price = Rs. 1000 for $q < 1000$
= Rs. 950 for $q \geq 1000$.

B. An investigation into the demand for water pumps manufactured by Joy Engineering Pvt. Ltd. resulted into the following historical data, **(10)**

Year	2012	2013	2014	2015	2016	2017
Sale (in hundreds)	28	33	37	48	54	68

Project the trend of sales for next **3** years.

Q4. A The processing times of 100 gears for the three conversion processes are given below; **(10)**

Gear	**Processing time (Hours)**		
	Blanking	**Gear Cutting**	**Gear Shaving**
G1	25	16	20
G2	26	20	19
G3	24	17	18
G4	22	20	21
G5	24	21	17
G6	28	18	13

(a) In what sequence should gears be scheduled to minimize processing time of all gears.
(b) Determine the elapsed time.
(c) Find percentage utilization of the machines in the first 100 hours.

{TURN OVER}

B. A workshop has four machines and four tasks for completion. Each of the machines can perform each of the four tasks. Time taken at each of the machines to complete each task is given in the table below. How should the tasks be assigned to machines to minimize requirement of machine hours? **(10)**

Task	Machine			
	A	B	C	D
	Processing time (Hrs.)			
I	51	77	49	55
II	32	34	59	68
III	37	44	70	54
IV	55	55	58	55

Q5. A. Solve the LPP, **(10)**

Maximize $Z = 4X_1 + 3X_2 + 6X_3$

Subject to,

$2X_1 + 3X_2 + 2X_3 \leq 440$

$4X_1 + 3X_3 \leq 470$

$2X_1 + 5X_2 \leq 430$

$X_1, X_2, X_3 \geq 0$

B. The activities and three time estimates in days for the activities are given in the table below. **(10)**

Activity	1-2	2-3	2-4	3-4	3-5	3-6	4-5	4-6	5-6
t_o	2	1	0.5	0	1	1	6	3	4
t_m	2	1.5	2.5	0	2.5	2.	7	4	6
t_p	8	11	7.5	0	7	3	8	11	8

i) Draw the network diagram.

ii) Determine the critical path.

iii) What is the probability that the project will be completed in 20 days?

Q6. Write Short Notes on:-

A. Relationship of PPC department with other departments. **(5)**

B. Two bin system. **(5)**

C. Forward Scheduling and Backward Scheduling. **(5)**

D. MRP I and MRP II. **(5)**

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