Thursday, May 23, 201910:30 am - 01:30 pm 1T01417 - B.E.(MECHANICAL)(Sem VII) (CBSGS) / 42804 - Production Planning & Control 56507

(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. Define the term Production Planning and Control and list down its need. **(5)**

B. What are subsidiary orders? How do they differ from work orders? Give its examples. **(5)**

C. What are the different types of inventories? **(5)**

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

E. Differentiate between CPM and PERT. **(5)**

Q2. A. What are the functions of PPC system? **(10)**

B. With the help of neat sketch, derive the equation for EOQ with instantaneous stock replenishment. (Basic inventory model) **(10)**

Q3. A. Classify the following items into ABC and draw the ABC curve. **(10)**

Item No.	501	502	503	504	505	506	507	508	509	510
Annual consumption	300	2800	30	1100	40	2200	150	800	600	80
Unit Price (Rs)	10	15	10	5	5	10	5	5	15	10

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 Use graphical method to minimize the time required to process the following jobs on the machines. Calculate the total elapsed time to complete both the jobs. **(10)**

Job 1	**Sequence**	**A**	**B**	**C**	**D**	**E**
	Time (Hrs)	6	8	4	12	4
Job 2	**Sequence**	**B**	**C**	**A**	**D**	**E**
	Time (Hrs)	10	8	6	4	12

{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. What are the advantages and limitations of linear programming methods? **(10)**

A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of three products and the daily capacity of the three machines are given in the table below.
It is required to determine the daily number of units to be manufactured for each product. The profit per unit for product 1, 2, and 3 is Rs. 4, 3 and 6 respectively. It is assumed that all the amounts produced are consumed in the market. **Formulate** the mathematical linear programming model that will maximize the daily profit.

Machine	Time per unit (minutes)			Machine capacity (mins/day)
	Product 1	Product 2	Product 3	
M1	2	3	2	440
M2	4	-	3	470
M3	2	5	-	430

B. List of activities for a job is given below. Job A must precede all others while job E must follow others. Apart from this, jobs can run concurrently. **(10)**

Jobs	Normal		Crash	
	Duration (days)	Cost (Rs)	Duration (days)	Cost (Rs)
A	5	3000	4	4000
B	6	1200	2	2000
C	4	1000	3	1800
D	5	1200	3	2000
E	3	1600	3	1600

i) Draw the network and identify the critical path.
ii) Crash the network fully to find out minimum duration.
iii) If indirect costs are Rs. 300 per day, determine time cost trade off for the project

Q6. Write Short Notes on:-

A. Pre requisites of PPC. **(5)**
B. JIT and its seven wastes. **(5)**
C. Two bin system. **(5)**
D. Forward scheduling and backward scheduling. **(5)**

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