

R16

Code No: 138EG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, September - 2020

PRODUCTION PLANNING AND CONTROL

(Mechanical Engineering)

Time: 2 Hours

Max. Marks: 75

Answer any Five Questions

All Questions Carry Equal Marks

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1. State and explain the objectives of Production Planning and Control (PPC). [15]
2. Forecast the production for next two years when the production quantity for last ten years is as follows:  
200, 225, 235, 240, 255, 260, 265, 275, 270, 271  
Use the following methods to compute the forecast and comment on results  
a) Moving average (3 years and 5 years)  
b) Exponential smoothing for  $\alpha=0.3$  and  $0.7$  [8+7]
3. An engine manufacturing company stocks the items as shown in the following table in its stores. The unit price, annual consumption quantity in terms of units/year are also given in the same table. Classify the items into A, B, and C categories. [15]

Component Code	Description	Price /unit	Unit/year
C001	Connecting rod	500	600
C002	Crank case	4000	600
C003	Cylinder	2000	600
C004	Cylinder head	3000	600
C005	Crank shaft	4000	600
C006	Cam	500	1200
C007	Nozzle	500	600
C008	Valve set	1000	1200
C009	Fuel injection pump	1500	600
C010	Exhaust pipe	500	600

4. One unit of product Y is made from four units of A, one unit of B and one unit of C. B is made from one unit of D and two units of E. C is made from one unit of F and three units of G. Items Y, B, F and G have lead times of one week; items C, D and E have lead times of 2 weeks and item A has a lead time of 3 weeks. Items Y, B, C and G are made by the company and the other items are purchased. The gross requirements for product Y during the next 12 weeks are 40 units in week 6, 60 in week 9, 20 in week 10 and 50 in week 12. Suppose the company expects to have 50 units of A, 20 units of B, 40 units of E, and 90 units of G on hand at the beginning of week 1. Construct the a) material requirement plan for product Y and b) each of its components using lot-for-lot procurement for all items except E. [15]

5. A manager wants to assign tasks to workstations as efficiently as possible and achieve an hourly output of 331/3 units. Assume the shop works a 60-minute hour. Tasks times and precedence relationships are as follows:

Tasks	a	b	c	D	e	f	g	h
Processing time	1.4	0.5	0.6	0.7	0.8	0.5	1.0	0.5
Immediate predecessor	-	a	b	B	b	c	D,e	f,g

- a) Draw the precedence diagram  
 b) Determine cycle time  
 c) Determine the minimum number of stations needed.  
 d) Assign tasks to workstations on the RPW method. [15]

6. For the following job-shop system,  
 The time spent in hours in processing two jobs on six machines A, B, C, D, E and F and the necessary technological orderings of machines are as follows.

Job 1: A.20 C.10 D.10 B.30 E.25 F.15  
 Job 2: A.10 C.30 B.15 D.10 F.15 E.20

Use graphic method to determine an optimal sequence of jobs which minimizes the elapsed. [15]

7. Draw move ticket, tool ticket and job ticket and explain various aspects of it. [15]  
 8. State and explain various steps involved in expediting procedure. [15]

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