

BACHELOR OF PRODUCTION ENGG. EXAMINATION, 2017(2nd Year-2nd Semester)**SUBJECT – Production Management**

Time: Three hours

Full Marks: 100

Answer Question No. 1 and any *three* from the rest.1. Answer (a) and any *four* from the following:

- (a) What is a production system? State the various external and internal factors influencing the transformation process in a production system and also state various parameters by which you can measure the performance of profit making and non-profit making organizations. 2+6+4
- (b) Describe various existing organizational pattern of the firms on the basis of their ownership. Which type of pattern is most beneficial for our nation's economical development? 7
- (c) Describe briefly the feature of Job, Batch and continuous production type of industries. Cite one example of each type of industries. 7
- (d) Define scheduling. What are the priority sequencing rules? Discuss the advantages and limitations of using the Gantt chart. 7
- (e) What is quantity discount? State four alternative situations to be occurred in the case of quantity discount offered for a single price break point system. 7
- (f) What is the function of safety stock? What are all the various uncertainties against which you would like to protect the inventory? 7
- (g) Within the context of overall planning for production, explain the role of Material Requirements Planning. How does it differ from Manufacturing Resource Planning? 7

2. (a) Identify the effect of various types of variations in the part date which should be considered during forecasting computation. 6

(b) Monthly sales in thousand of rupees for the last year of a product are as follows:

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
150	180	208	250	300	344	250	186	212	315	260	260

Assume, initial forecasting value is 150 and initial trend value is zero.

- (i) Determine the forecast for next January using the simple exponential smoothing for $\alpha = 0.10$. 6
- (ii) Calculate the forecasted demands over as much of this period as possible and compare the accuracy of the utilized forecasting method and comment on the practical implications of adopting the method.
3. (a) A scheduler has four jobs that can be performed in any of four centers. The profit per job is listed in the table below if they are performed in those work centers. Determine the allocation of jobs to work centers that results in the maximum profit if jobs cannot be split. 10

Job	Work Centres			
	#1	#2	#3	#4
A	19	14	17	16
B	12	15	18	19
C	16	22	14	13
D	17	19	20	15

- (b) Using graphical method, determine the minimum time needed to process two jobs on six machines. The information about the machining sequence and the time required by each job on each machine is given below: 10

	JOB 1						JOB 2					
M/c Sequence:	A	B	C	D	E	F	B	A	C	F	D	E
Time (Hours):	4	5	1	3	6	5	6	3	2	4	3	5

4. (a) A textile mill produces a special fibre at the rate of 5000 meters per hour. The fibre is used in the other products made by the mill, at the rate of 20,000 meters per day in the 8-hour shift. The cost fibre is Rs. 5 per meter. The inventory carrying cost is 25 per cent and the setup costs are Rs. 4050 per set-up. Compute the optimal number of cycles required in a year for manufacturing of this special fibre. 8
- (b) A manufacturing unit uses 8000 components of a cutting tool each year, which it purchases from an outside supplier under the following term: 12

Order Size	Price per unit (Rs.)
1-999	22.00
1000-1499	20.00
1500-1999	19.00
2000 and above	18.00

Each time an order is placed, clerical and handling cost of Rs. 180/- is incurred. The holding cost is 10 per cent of the average inventory value. No safety stock is held. If the components are used at a uniform rate, calculate the best order size and total annual stocking cost to the company.

5. (a) An assembly line consists of the tasks as per the following table:

Task :	a	b	c	d	e	f	g	h	i
Immediate Predecessor :	—	—	b	a,c	—	e	e,f	d,g	h
Task time (min)	1.8	0.5	0.6	1.0	0.3	1.0	0.7	0.9	0.8

- (i) Balance the line for a cycle time for 2.5 minutes and determine the balance delay. 6
- (ii) Balance the line for a cycle time of 2.0 minutes and state whether the workstations and the idle time changes from (i). 6
- (iii) Calculate the maximum output possible from the line and for a minimum possible number of workstations, the percentage of idle time. 4+4
6. (a) (i) From the information given below for a product 'A' develop the product structure free.
- | | | | | | |
|------------|------------------------------|--------------|------|--------------|--------------|
| Parent : | A | B | C | D | H |
| Component: | B(2)
C(1)
D(1)
E(4) | F(2)
G(1) | H(1) | I(1)
J(4) | K(3)
L(2) |
- (ii) Make an indented bill of materials with level loading for product 'A'.
- (iii) An order has been received for 150 units of product 'A'. If no stock is available or an order, determine the order size of each component. 4+4+4
- (b) A product 800 is to make from two 801 subassemblies, three 802 subassemblies and two 803 subassemblies. A subassembly 801 consists of two units of component 406 and two units of part 407. The 802 subassembly is made from two units of components of 205 and one unit of part of 603. An 803 subassembly consists of one part of 407, one 950 component and three 747 subassemblies. An 747 subassemblies is made from six units of item 942. Create a product structure tree for product 800 and determine how many units of each component is required to produce 100 units of product 800. 8