Seat No. : _____

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April-2016

4th Year M.B.A., Integrated

Production and Operations Management

Time : 3 Hours]

[Max. Marks : 100

1. (A) Define the term Production System Model with the help of a diagram. Name the
inputs of the production system. How can they be classified ?10

OR

Discuss the emerging role of the Production and Operations Manager in India. What are the recent trends in Production and Operations Management ?

(B) Explain the Qualitative and Quantitative methods used for forecasting demand. 10

OR

Discuss the various types of process in detail with their main characteristics and examples.

- 2. Attempt any two from the following :20
 - (1) Compute the production cost per piece from the following data : 10
 - (a) Direct material per piece \gtrless 2.
 - (b) Wage rate ₹ 2,000 per month consisting of 25 working days and 8 hours per day.
 - (c) Overheads expressed as a percentage of direct labour $\cos t 200$ %.
 - (d) The time for manufacture of 4 pieces of the item was observed during time study. The manufacture of the item consists of 4 elements a, b, c and d. The data collected during the time study are as under.

Elements	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Element Rating on B.S. Scale (0-100)
а	1.2	1.3	1.3	1.4	85
b	0.7	0.6	0.65	0.75	120
c	1.4	1.3	1.3	1.2	90
d	0.5	1.5	0.6	0.4	70

Time observed (in minutes) during the various cycles are as below :

The personal, fatigue and delay allowance may be taken as 25%.

Elomon4a	Cycle time in minutes						
Elements	1	2	3	4			
1	1.5	1.5	1.3	1.4			
2	2.6	2.7	2.4	2.6			
3	3.3	3.2	3.4	3.4			
4	1.2	1.2	1.1	1.2			
5	0.51	0.51	0.52	0.49			

(2) The elemental times (in minutes) for 4 cycles of an operation using a stop watch are presented as below :

10

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Calculate standard time for the operation if

- (i) Elements 2 and 4 are machine elements.
- (ii) For other elements, the operator is rated at 110%.
- (iii) Total allowances are 15% of the normal shown in time.
- (3) The following information is available for a factory :

Daily working hours -8

No. of working days in a week -6

No. of Operators -20

Std. hours per unit of production -4

During a particular week

No. of units produced -48

Absentee man days - 40

Idle time due to load shedding – 30 man days

Find :

- (a) Absenteeism percentage.
- (b) Labour Utilisation percentage.
- (c) Productive efficiency of labour.
- (d) Overall productivity of labour in terms of units produced/week/employee.

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- 3. (A) "Production Planning and Control is the key to the success of a business organization." Discuss this statement listing the various functions carried out under production control and state their purpose in brief. 10
 - (B) A bill of material is desired for a bracket (Z 100) that is made up of a base (A 10), two springs (B 11) and four clamps (C 20). The base is assembled from one clamp (C 20) and two housing (D 21). Each clamp has one handle (E 30) and each housing has two bearings (F 31) and one shaft (G 32). 10
 - Design a product structure tree that includes the level coding information. (a)
 - Show the data in the form of an indented bill of material. (b)

OR

Complete the MRP Plan for item X shown below :

Note that this item has an independent demand that necessitates a safety stock of 40 units to be maintained.

						We	ek					
Order Quantity = 70												
Lead time = 4 weeks	1	2	3	4	5	6	7	8	9	10	11	12
Safety Stock 40												
Project Requirements	20	20	25	20	20	25	20	20	30	25	25	25
Scheduled Receipts		70										
On hand at the end of period 65												
Planned Order Release												

4.	(A)	Explain	'Material Control Cycle'.	What are the steps involved in it?	10
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OR

	3	P.T.O.
(b) What is Materials budgeting ? State the benefits of materials budget.	5
(a) Write a note on 'Make or Buy Analysis'.	5

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No. of breakdowns	No. of months this occurred
0	3
1	7
2	9
3	3
4	2
Total	24

(B) The number of breakdowns of equipment over the past 2 years is as below :

Each breakdown costs an average of ₹ 300. Preventive maintenance service can be hired at a cost of ₹ 150 per month and it will limit the breakdowns to an average of one per month.

Which maintenance arrangement is preferable, the current breakdown maintenance policy or a preventive maintenance service contract ?

5. (A) State and explain the strategic issues on Operations Management.

Activity	Estimated duration of activity (in weeks)					
	Optimistic Time (t _o)	Most likely time (t _m)	Pessimistic time (t _p)			
1 - 2	2	5	8			
1 - 4	4	19	28			
1-5	5	11	17			
2 - 3	3	9	27			
2 - 6	3	6	15			
3-6	2	5	14			
4 - 6	3	6	15			
5 - 7	1	4	7			
5 - 8	2	5	14			
6 – 8	6	12	30			
7 - 8	2	5	8			

(B) The activities of a project and their time estimates are given below :

(i) Draw the PERT network diagram.

(ii) Determine the mean time and standard deviation of each activity.

(iii) Determine the Critical path and the Standard Deviation for the Critical Path.

(iv) Calculate the slack for the events.

(v) Calculate the total float, free float and independent float for each activity.

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