2014

M B A

3rd Semester Examination

Subject : PRODUCTION, PLANNING AND CONTROL

(Specialization : Operations and Systems Management)

PAPER—OS 303

Full Marks : 100

Time : 3 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Write the answers to Questions of each Half in separate books.

(First Half)

(Marks : 50)

1. Answer any *four* questions from the following :   5×4

    (a) A product's forecasted demand *vs.* actual demand is depicted below :

Period	Forecasted Demand (units)	Actual Demand (units)
1	900	1000
2	1000	1100
3	1050	1000
4	1010	960
5	980	970
6	985	970
7	980	995

Calculate the tracking signal. 5

(b) Explain the concept of aggregate planning. 5

(c) Differentiate between the P-system and the Q-system of inventory management.

(d) Name the various factors affecting the process planning.

(e) Five jobs are to be scheduled in two machines in a manufacturing shop. All the five jobs undergo processing in both the machines (flow shop) and the table below has the information on the processing time in both the machines.

Job No.	Processing Time	
	Machine 1	Machine 2
1	4	7
2	6	3
3	2	3
4	7	7
5	8	6

Identify the best sequence using Johnson's rule. Also calculate the total idle time in machines 1 and machine 2.

(f) A hospital procures its supplies of a material once in a year. The total number of procurement is 2400 packages in a year. The accounts department finds this policy of procurement of material once a year as wastage of working capital. The accountant calculates the cost of inventory holding at Rs. 36 per package per year. It is also figured that the cost of procurement add upto Rs. 1,200 per order. What inventory policy would you advise to this hospital ?   5

2. Answer any *two* questions of the following :   10×2

(a) What is operations scheduling? What are the problems that may arise due to absence of proper operation scheduling?   4+6

(b) The aggregate demand for a product is given below :

	JAN	FEB	MAR	APRIL	MAY	JUNE
Demand Forecast	1800	1500	1100	900	1100	1600
Working Days	22	19	21	21	22	20

(Turn Over)

Also the following are given :

- Inventory holding cost = Rs. 1.50/unit/month

- Marginal stock-out cost = Rs. 5/unit/month

- Labor hours required = 5/unit

- Straight time cost (8 hrs) = Rs. 4/hour

- Opening inventory = 400 units

- Safety stock = 25% of monthly demand.

Devise an Aggregate Production Plan under 'constant work force plan' and calculate total cost excluding material cost.

(c) The production manager of a company requires 3600 kg of raw material for manufacturing a particular item per year. It has been estimated that the cost of placing an order is Rs. 36 and the cost of carrying inventory is 25 per cent of the investment in inventories. The price is Rs. 10 per kg. Help the purchase manager to determine an ordering policy for raw material.

[*Internal Assessment : 10*]

(Second Half)

(Marks : 50)

3. Answer any *four* of the following :   5×4

(a) Explain Enterprise Resource Planning (ERP).

(b) State with examples the challenges in application of JIT in an automobile manufacturing plant. What are the benefits of implementing JIT ?

(c) What do you mean by the term "Ergonomics" ? Give an example of its application in PPC.

(d) Write a short note on Value Analysis.

(e) Determine the economical machine for a particular component using the following data :

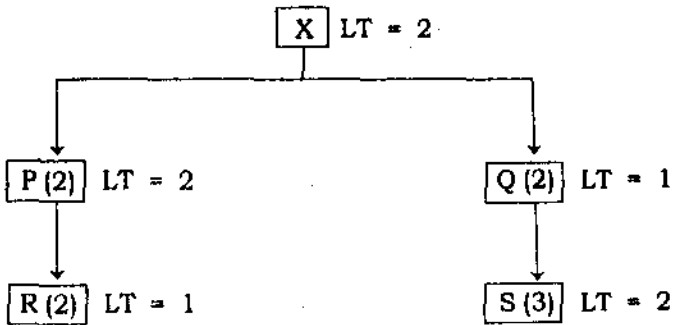|		Capston Lathe	Auto Lathe
1.	Set up time	1 hr.	6 hrs.
2.	Operating time	10 min	2 min
3.	Set up labour cost	7 Rs./hr.	7 Rs./hr.
4.	Operating Labour Cost	5 Rs./hr.	2 Rs./hr.
5.	Tooling cost	Nil	200 Rs.
6.	Machine over-head	15 Rs./hr.	28 Rs./hr.
7.	Lot size	1500 Nos.	1500 Nos.

(f) What is Bottleneck ? A firm has four work centre A, B, C and D in series with individual working capacities of 430, 380, 350 and 410 units respectively. The actual output is 310 unit per day. Calculate the system capacity and system efficiency.

1+4

4. Answer any *two* questions :   10×2

(a) State the concept of measurement of capacity. Explain capacity requirement planning (CRP) process.

(b) Describe briefly the components of an MRP system. The BOM for a certain end product X is given in figure below. Develop an MRP schedule for item P, Q, R and S so that 300 units of X can be produced in the 6th week. On-hand inventory of component Q is 100 units.

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        ┌───┐
        │ X │ LT = 2
        └───┘
     ┌─────┴─────┐
     ↓           ↓
┌──────┐    ┌──────┐
│ P (2)│ LT=2   │ Q (2)│ LT = 1
└──────┘    └──────┘
   │           │
   ↓           ↓
┌──────┐    ┌──────┐
│ R (2)│ LT=1   │ S (3)│ LT = 2
└──────┘    └──────┘
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* LT = Lead Time

(c) A component sub-assembly for a particular item can produce 80 units during an 8 hours shift. The operation consists of three activities as shown below :

Operation	Activity	Standard time (min)
A	Fitting	12
B	Casing	16
C	Inspection	03

(i) How many workers will be required for each activity ?

(ii) If this sub-assembly has dedicated workforce what is the percentage idle time for the entire operation.

(iii) Compute the balance efficiency.

4+3+3

[Internal Assessment : 10]

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TB—425