Subject	Manufacturing Resources Planning & Control		
Roll No.		Marks	60 Marks
Total No. of Questions		Duration	3 Hours
Total No. of printed pages	3	Date	29.10.2018

Q1). 20 Marks (Compulsory)

Please study the case given below and answer the questions given at the end. You may assume any data as required. Please note that the questions are given only as guidance and students should go beyond these questions and bring out other points of special interest arising from this case.

Case Study

ABC Dhampur consistently recorded profit and increased productivity of the workman since its inception. After the price decontrol of sugar, many new players have started producing sugar under collaboration with international firms having latest technology and making profit by cost reduction. In the past ABC Dhampur had gone for backward integration by developing its own plantation. With the liberation, the import of sugar became cheaper and the new players are importing the inputs.

The company's performance in terms of productivity and profit has gone down due to the changed environment. The Board of Directors of the company decided to take the following steps:

a) Modernization and automation of the plant
b) Reduction of man power by introducing the voluntary retirement scheme
c) Disposal of captive plantation area and switch over to the import of inputs
d) To reconstruct the organization and separating materials management from manufacturing, production planning and control from the traditional manufacturing activity
e) Introduction of computerization and developing a strong MIS

Questions:

Q1. Analyze the changes in environment leading to fall in profits.   5 marks
Q2. What are the advantages of turnaround strategy?   7 marks
Q3. Give a similar example of turnaround strategy.   4 marks
Q4. Bring out any other special points arising from this case.   4 marks

Attempt Any FOUR from the Remaining SIX Questions

Q2). *Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks*
  a) Examine the capacity in an operating system? Are input measures of capacity more appropriate than output measures?
  b) A manufacturer of ceiling fans offers three versions of the product to its customers; basic (three blades), improved (four blades), and deluxe (enhanced performance features). The table below gives information on the machine hours required for each of these variations and the number of fans to be manufactured in the next quarter. Assume 25 working days per month.

Fan Type	April	May	June	M/c hours per unit
Basic	140	160	160	9.50
Improved	110	150	150	12.00
Deluxe	120	120	140	18.50

(i). Choose an appropriate aggregate unit for planning the production

(ii). For the chosen aggregate unit, estimate the capacity required with justifications for the choice.

(iii). If the manufacturer operates two shifts each of eight hours, how many machines are required for meeting the demand during the next quarter?

c) Examine the alternative methods by which capacity can be augmented in an operating system? Explain with some examples. How does knowledge of capacity help an operations manager?

Q3). Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks

a) Explain the inventory planning for independent demand items different from that for dependent demand items? Give examples.

b) Identify suitable APP alternatives for an organization manufacturing made-to-order items. Will your recommendation change if the items are made-to-stock?

c) A manufacturer of table fans has a factory that works on a single shift basis. A shift lasts eight hours, but 30 minutes will be lost in normal breakages and allowances to be given to workers. There are 300 working days in a year. There is a fabrication shop, an assembly shop and a painting shop in the factory. Each unit requires 2 hours in the fabrication shop, and 45 minutes each in assembly and paint shops. The workers are at 80% efficiency. Currently, the shop is manufacturing 20000 fans per annum. If there are 24 workers in the fabrication shop and 12 each in the assembly and paint shops, what will be the utilization of workers at the current level of operation?

Q4). Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks

a) Examine the key differences between level strategy and chase strategy in APP formulation?

b) Given in the table below is a partially completed MRP working for component X. Using the information provided, complete the table.

Component X   Lot size: 2 periods
BOM quantity: 1   Lead time: 1

	0	1	2	3	4	5	6
Gross requirement		200	150	100	200	120	200
On-hand inventory	300						
Net requirement							
Planned receipts							
Planned order releases							

c) How is MRP II different from MRP? Discuss the additional advantages that an organization will obtain by using an MRP II system?

Q5). Any two from (a) or (b) or (c) ————— (5x2) = 10 Marks

a) What do you understand by "Line Balancing"? How does it help in striking the trade-off between increased production and better utilization of resources?
b) "Mixed strategies are always superior to pure strategies in an Aggregate Production Planning (APP) exercise". Comment on this statement.
c) A manufacturer of spark plugs for the mass market would like to design the final assembly shop and requires certain data for the process. The factory works for two shifts and the total available time is 15 hours per day.
   (i). There are five tasks involved in the final assembly and the task times (in seconds) are 3.5, 4.5, 2.0, 3.0, and 4.0. What are the minimum and maximum outputs possible from the factory?
   (ii). The daily production needs to be 4000 plugs. What should be the cycle time of the operations at the assembly shop?

Q6). *Any two from (a) or (b) or (c)* ————— *(5x2) = 10 Marks.*
   a) Describe the information flows in an ERP system with a diagram. Explain the phases of ERP implementation.
   b) A manufacturer of condiments has to decide among Machines A, B, and C, three alternative machines available for packaging. While the initial fixed costs are high for machines B and C compared to Machine A, their operating costs are lower. The relevant cost data for each machine is given below: Compute the range of volume at which use of each machine is appropriate.

	Machine A	Machine B	Machine C
Fixed Cost (Rs.)	20000	40000	80000
Variable Cost (Rs.) / unit	5	4	3

   c) Is capacity management a short-term or a long-term issue? Explain with examples. Examine the implications of adding capacity in huge chunks at less frequent intervals?

Q7). *Any two from (a) or (b) or (c)* ————— *(5x2) = 10 Marks*
   a) In a textile firm, a worker is capable of tailoring three garments per day. Assume that the time taken for each garment is the same. The following data is given:
   Hiring cost: Rs. 3000, Layoff cost: Rs. 4000, Current employee strength is 40. Aggregate demand for the next four months is given below:

	June	July	August	September
Demand	3170	3000	2900	2660
Working days:	24	25	23	24

   Based on the given information, generate a production plan by following the "varying workforce strategy"
   b) Suppose an organization prepared an MRP on the basis of incorrect data on lead time. Examine the impact of this on actual operations?
   c) Examine the types of data that would be carried in the bill of materials file and the inventory record file.