UNIVERSITY OF PETROLEUM
AND ENERGY STUDIES

UPES
THE NATION BUILDERS UNIVERSITY

End Semester Examination, May 2017

Program/course: MBA(General Management)   Semester – II
Subject: Production Planning and Control   Max. Marks   : 100
Code   : MBCG771   Duration   : 3 Hrs.
No. of page/s: 4

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Section A   **Maximum Marks: 20**

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Note: Attempt all questions.

1.   Mark True/False (T/F) for the following (4 marks)

a)   Scheduled receipt is derived from MPS or planned order release of the parent   (T/F)

b)   Time phasing is the lowest level at which the item appears in product structure   (T/F)

c)   Correct amount of aggregation is highly dependent on type of products or services (T/F)

d)   Fixed order quantity is the method applicable to items when ordering costs are
        sufficiently high to rule out ordering   (T/F)

2.   Fill in the blanks (16 marks)

i.   The strategy focussing on altering the number of workers as a part of internal strategy is
        referred to as _____

ii.   The three general categories of strategic approaches used as a part of Sales and
        Operations Planning are _____, _____ and _____

iii.   _____ inventory is the inventory purposely placed between operations to allow
        them to operate independently of one another.

iv.   _____ lot sizing rule says you order the same quantity each time you order.

v.   The original approach to JIT focussed on _____ reduction.

vi.   The process of breaking down of aggregate plan into finer detail is called _____.

Section B

Note: Attempt any four questions. Each question carries 5 marks.

4.   Discuss how a lean production system can still operate effectively under uncertain market conditions-or can it?
5.   What changes, if any, will the perishability of the inventory have on the capability of the company in using a level strategy? Consider, for example, a fast food restaurant.
6.   Describe the possible cost implications of producing a standard product in a job shop environment.
7.   Discuss the arguments for using large smoothing constant for exponential smoothing instead of a small one. Under what conditions would each be better? Why?
8.   Describe the type of inventory policy you might find in each of the following operations, and describe why- a hospital, a cafeteria, an automobile repair facility and a dental office?

Section C

Note: Attempt all questions. Each question carries 10 marks.

9.   Given below is the demand data:

Period	1	2	3	4	5	6	7	8
Demand	17	22	18	27	14	18	20	25

Use the regression equation to forecast the demand for period 9.

10.   Find the optimal order quantity of a product for which the price breaks are as follows:

Quantity(units)	Price per unit(Rs.)
$0 < Q_1 < 100$	200
$101 <= Q_2 < 200$	180
$200 <= Q_3$	160

The annual demand of the product is 4800 units, the storage cost is 20 percent of the unit cost and the cost of ordering is Rs. 50 per order.

11.   A book binder has one printing press, one binding machine and manuscripts of 7 different books. The times required for performing and binding operations for different books are shown below:

Book	1	2	3	4	5	6	7
Printing	20	90	80	20	120	15	65

time(hours)							
Binding time(hours)	25	60	75	30	90	35	50

Decide the optimum sequence of processing of books in order to minimize the total time required to bring out all the books. Also find the total minimum elapsed time.

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Section D   **Maximum Marks: 30**

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Note: Attempt any two questions. Each question carries 15 marks

12. For the below demand data set apply the Wagner-Whitin Algorithm

Period	1	2	3	4	5
Demand	50	80	180	80	0

Setup Cost(Ordering Cost) = Rs. 206, Inventory Carrying Cost = Rs. 4 per part period

The formula for the same is given as under:

$$\text{Let } F(t) = \min\left[\min\left[s_j + \sum_{h=j}^{t-1}\sum_{k=h+1}^{t} i_h d_k + F(j-1)\right], s_t + F(t-1)\right]$$

13. Product A is made from two components, B and C. It takes one B and three C's to make a single product A. Component B is made from two parts D's. Component C is made from one part D and 2 part E's. Use this information together with data below to answer the following questions:

Part	Lead Time	Lot Size	On hand	Scheduled Rcpts
A	1	Lot for Lot	50	None
B	1	Lot for Lot	10	None
C	2	200	100	None
D	1	300	120	None
E	2	500	0	500, week 1

a) Make MRP records for A, B, C, D, and E. Production quantities and production start dates   for A are: 20 in week 2, 50 in week 4, 30 in week 6, 40 in week 7, 50 in week 9, and 40 in week 11.

Use the below MRP record:

Week	
Gross Requirement	
Scheduled receipts	
Projected Available	
Net requirements	
Planned order release	

14. ABC company produces toilet soaps at their works. Aggregate Planning measures used by ABC is tonnes of soap which includes making and packing of the soap. The planning is done for a time horizon of one year or four quarters.

Quarter	1	2	3	4
Demand	35	55	60	45

The company has a regular workforce which can produce 35 tonnes of output per quarter.If the workers are allowed to work overtime with the restriction that the extra time cannot be more than 20% of the regular time. The output rate is 25% higher than regular time during overtime but the overtime expenses are 40% more than the regular time. The company subcontracts the soap making and packing operation but only at a cost of 50% premium than the cost of production. The regular time production costs are Rs. 10000/- per tonne.

No shortages are allowed as per company policy. Inventory carrying costs are Rs. 5000/- per tonne per annum.

Design the cost efficient aggregate plan assuming zero starting inventory. Compute the total production cost.