



**University of Petroleum & Energy Studies**  
**College of Management & Economics Studies**  
 Kandoli Campus, Dehradun

**End Semester Examination – May, 2018**

**Programme Name: MBA (PM)**  
**Subject: Operations Management**  
**Subject code: LSCM 7001**

**Semester - II**  
**M.Marks: 100**  
**Duration: 3 Hrs**

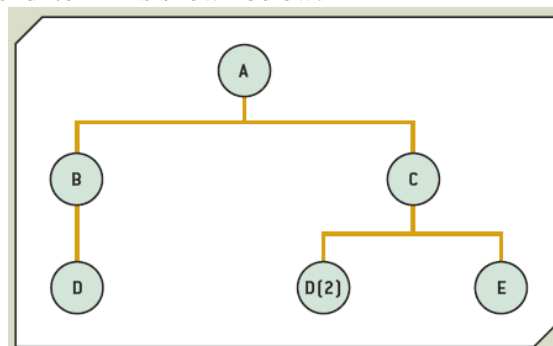
**Note: All sections are compulsory & this question paper carries 4 sections.**

**Section – A (20 Marks)**

**Attempt all questions in this section. Each question carries 2 marks each**

A hotel purchases 8,000 gallons of a cleaning product annually. Each gallon costs \$10 and the cost of holding one gallon for a year is estimated to be \$3. Ordering cost amounts to \$30 per order. Answer 1 & 2

1. If the hotel orders in lots of 500 gallons, how many orders does it place each year?  
 (a) 14                      (b) 15                      (c) 17                      (d) none
  
2. What is the total annual cost?  
 (a) \$1120                      (b) \$ 1150                      (c) \$ 1350                      (d) none
  
3. The bill of material for end item A is shown below:



Item	On-Hand Inventory
A	50
B	50
C	90
D	70
E	15

- Calculate the dependent demand for D

(a) 50                      (b) 60                      (c) 70                      (d) none
  
4. A \_\_\_\_ is a statement of how many finished items are to be produced and when they are to be produced.

- (a) Aggregate Plan
  - (b) Master Production Schedule
  - (c) Material Requirements Plan
  - (d) Capacity Requirements Plan
5. Which lot sizing rule is best when inventory carrying costs are high and setup/order costs are low?
- (a) Lot-for-Lot (LFL)
  - (b) Fixed order quantity (FOQ)
  - (c) Periodic order quantity (POQ)
  - (d) None
6. A company currently has no items in inventory. The demand for the next four months is 200, 400, 250 and 350 units. Determine the level production rate if a level strategy is selected with the goal of ending Period 4 with 100 units in inventory.
- (a) 300                      (b) 310                      (c) 350                      (d) none
7. Johnson's sequencing rule is used to sequence
- (a) several jobs through several work centers
  - (b) several jobs through one work center
  - (c) two jobs through several work centers
  - (d) several jobs through two work centers
8. Staff scheduling needs all of the following except the
- (a) Flow-time estimates
  - (b) Accurate forecasting
  - (c) Staffing levels required by time period
  - (d) Determining available personnel
9. Which leader in quality management promoted the Quality Trilogy of quality planning, quality control, and quality improvement?
- (a) W. Edwards Deming
  - (b) Joseph Juran
  - (c) Philip Crosby
  - (d) Jack Hillerich
10. Which of the following is not one of W. Edwards Deming's 14 points?
- (a) Create a vision and demonstrate commitment
  - (b) Stop making decisions purely on the basis of cost
  - (c) Eliminate exhortation
  - (d) The only performance standard is Zero Defects

**Section – B (20 Marks)**

**Attempt any 4 question, each question carries 5 marks only    (5\*4=20 marks)**

2. (a) Determine the reliability of the system shown below where lamp 2(backup of lamp 1), lamp 4(backup of lamp 3), lamp 5(backup of lamp 4), lamp 7(back up of lamp 6)



<b>Demand forecast</b>	1800	1500	1100	900	1100	1600	8000
<b>Number of working days</b>	22	19	21	21	22	20	125

**Costs**

Materials	\$ 100/unit
Inventory holding cost	\$ 1.5/unit/month
Marginal cost of stockout	\$ 5/unit/month
Marginal cost of subcontracting	\$ 20/unit
Hiring & training cost	\$ 200/worker
Layoff cost	\$ 250/worker
Labour hours required	5/unit
Straight time cost(first eight hours each day)	\$4/hour
Overtime cost	6/hour

**Inventory**

Beginning inventory	200 units
Safety stock required	25% of month demand

What is the cost of each of the following production strategies?

- (i) Level strategy    (ii) subcontracting

(c) Information for café coffee day is given below. Fixed costs are \$3500 per month

Item	Price(\$)	Cost	Annual forecasted sales unit
Sandwich	2.95	1.25	7000
Soft drink	.80	.30	7000
Baked potato	1.55	.47	5000
Tea	.75	.25	5000
Salad bar	2.85	1.00	3000

Calculate the breakeven point in dollars

(d) Five jobs are waiting to be assigned. Jobs area given below

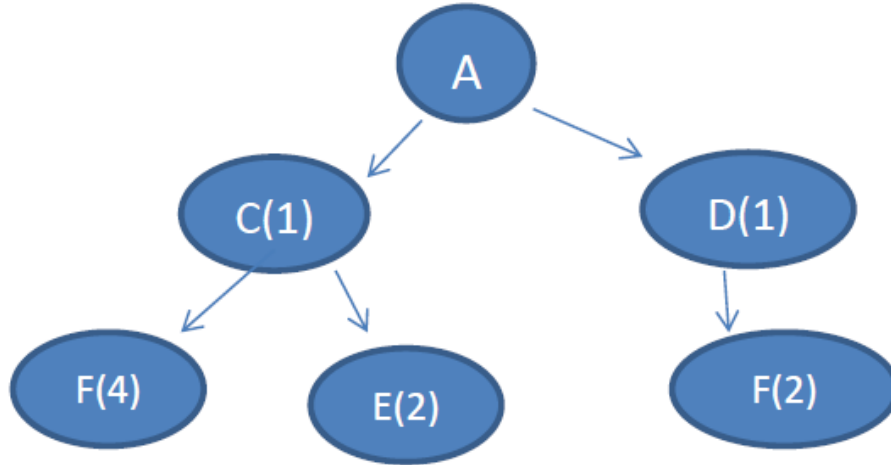
Job	Job work(processing time)	Job due date(days)
A	6	8
B	2	6
C	8	18
D	3	15
E	9	23

Using SPT, FCFS, EDD & LPT rule, Calculate

- (i) Average completion time
- (ii) utilization
- (iii) Average number of jobs in the system
- (iv) average job lateness

**Section – D (30 Marks)**

**Attempt the situation & provide the solution for this situation**



In the above figure, the bills of material and inventory records for product A is given & their components. The MPS for product A calls for completion of 100 units in period 2, 125 units in period 4 & 150 units in period 6. The manufacturing lead time for product A is 1 week. The numbers in parentheses are the number of parts needed to make the parent item. Compute a full MRP explosion & apply the appropriate lot sizing rules to determine a schedule of planned order releases

	<b>Part C</b>	<b>Part D</b>	<b>Part E</b>	<b>Part F</b>
<b>Lot size rule</b>	FOQ=250	LFL	FOQ=1000	POQ=2 weeks
<b>Lead time(weeks)</b>	2	1	1	2
<b>Schedule receipts</b>	300(week 1)	None	None	1000 (week 2)
<b>Beginning inventory</b>	0	125	750	2500
<b>Spare parts orders</b>	None	100 each in week 3 & 6	None	none
<b>Source of item</b>	Manufactured in house	Manufactured in house	Manufactured in house	Purchase items from supplier