LSCM 7001	**Operations Management**	L	T	P	C
Version 1.0		3	0	0	3
Pre-requisites/Exposure	Graduate in Engineering/Science discipline				
Co-requisites					

Course Objectives

- To develop an understanding of how the operations, have strategic importance and can provide a competitive advantage in the workplace.
- To understand the relationship between operations and other business functions.
- To understand techniques of location and facility planning; line balancing; job designing; and capacity planning in operations management.
- To understand the Materials Management function starting from Demand Management through Inventory Management.

Course Outcomes

On completion of this course, the students will be able to

CO1. Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.
CO2. Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments
CO3. Develop aggregate capacity plans and MPS in operation environments.
CO4. Plan and implement suitable materials handling principles and practices in the operations.
CO5. Plan and implement suitable quality control measures in Quality Circles to TQM.

Catalog Description

Operations & Materials Management (OMM) deals with the design and operation of the systems for production of goods and services. It will explore the approaches and analyze strategic decisions in operations management with a focus on designing products and processes, allocating scarce resources to strategic alternatives, and do long-range capacity and facility planning. These operations functions help in achieving the organization's long-range objectives. Subsequent focus will be on medium and short term planning and controlling. Care will be taken to strike a balance between theoretical and practical perspectives in manufacturing and service organizations.

Course Content

Unit I: INTRODUCTION [6 Lecture Hours]
Introduction to operations and Materials Management, Evolution Scope and Development Stages of OM, Operations strategy: As a competitive weapon & Concept of productivity

Unit II: FORECASTING [3 Lecture Hours]
Introduction to Forecasting Time Series Introduction, Components of Time Series, Types of Forecasting, Regression Method, Moving Average, Exponential method, Double Exponential method.

Unit III: FACILITY LOCATION & LAYOUT [6 Lecture Hours]
Facility location: Parameters & Criterion for selection of a location, Different types of layouts, their planning and production systems, Service Layouts & Operations.

Unit IV: ASSEMBLY LINE BALANCING & SCHEDULING [6 Lecture Hours]
Networking of Process Flow, Assembly Line Balancing, Scheduling of Operations.

Unit V: CAPACITY PLANNING [3 Lecture Hours]
Planning Capacity Across the Organization, Planning Long-Term Capacity, Capacity Timing and Sizing Strategies.

Unit VI: MATERIALS MANAGEMENT [3 Lecture Hours]
Materials Handling, Role of purchase department, Inventory Basics, ERP, KANBAN System, Lean operations and JIT.

Unit VII: INVENTORY PLANNING & CONTROL [6 Lecture Hours]
EOQ Models, Inventory Control Techniques: ABC,VED analysis etc.

Unit VIII: QUALITY PLANNING & CONTROL [3 Lecture Hours]
Total Quality Management (TQM), Statistical Process Control, Control Charts.

Text Books

1. James R Evans & David A Collier – Operations Management: Thomson Press Pub.
2. Richard B Chase, F Robert Jacobs, Nicholas J Aquilano, & Nitin K Agarwal – Operations Management for Competitive Advantage; Tata McGraw-Hill (12th Edition)

Reference Books

1. Richard B. Chase, Ravi Shankar and F. Robert Jacobs (2014); Operations & Supply Chain Management; McGraw-Hill - 2014 (14th Edition).
2. Chary S. N. Theory and Problems in Production & Operations Mgt.; Tata McGraw Hill (14th Edition).
3. Krajewski Lee; Operations Mgt. Process for Value Chains; Prentice Hall (8th Edition).
4. Russell S. Roberta & Taylor, Operations Mgt., Prentice Hall (4th Edition).

Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination

Examination Scheme:

Components	Internal Assessment (Class Participation/Project Assignment/Quiz)	ESE
Weightage (%)	50	50

Relationship between the Course Outcomes (COs) and Program Outcomes (POs)

Mapping between COs and POs		
	COURSE OUTCOMES (COs)	**POs**
CO 1	Identify the elements of operations management and various transformation processes to enhance productivity and competitiveness.	PO 1,2,3,6,7,12,13
CO 2	Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production & scheduling and sequencing techniques in operation environments	PO 1,2,3,5,6,8,10,11, 12,13
CO 3	Develop aggregate capacity plans and MPS in operation environments	PO 1,2,3,6,8,9,10. 11
CO 4	Plan and implement suitable materials handling principles and practices in the operations.	PO 1,2,3,5,7,9,11
CO 5	Plan and implement suitable quality control measures in Quality Circles to TQM.	PO 1,2,5,7,9,10

Program Outcome / Course Outcome mapping

Course Outcomes	**CO 1**	**CO 2**	**CO 3**	**CO 4**	**CO5**
PO 1	3	3	2	3	2
PO 2	3	3	3	3	3
PO 3	3	3	3	2	2
PO 4	2	1	1	1	1
PO 5	3	3	3	2	2
PO 6	3	2	2	2	1
PO 7	2	2	2	2	2
PO 8	3	3	3	3	2
PSO 9	3	3	3	2	2

PSO 10	3	3	2	2	2								
PSO 11	2	2	2	2	2								
PSO 12	3	2	2	2	1								
PSO 13	3	3	3	2	2								

		Students will be able to develop and evaluate alternate managerial choices and identify optimal solutions.	Students will demonstrate effective application capabilities of their conceptual understanding of power generation, transmission and distribution.	Students will be able to exhibit effective decision-making skills, employing analytical and critical thinking ability.	Students will demonstrate effective oral and written communication skills in the professional context.	Students will be able to work effectively in teams and demonstrate team-working capabilities.	Students will exhibit leadership and networking skills	Students will demonstrate sensitivity towards ethical and moral issues and have ability to address them in the context of power management.	Students will demonstrate employability traits in line with the needs of changing dynamics of the power industry.	Students will demonstrate strong conceptual knowledge in fuel management, power generation, transmission, distribution, trading, energy management,	Students will demonstrate effective understanding of functioning of power sector.	Students will demonstrate analytical skills in identification and resolution of issues pertaining to fuel management, power generation, transmission,	Students will exhibit the ability to integrate technical, economic, social and regulatory frameworks for power sector planning and resource management.	Students will exhibit deployable skills pertinent to the power sector.
Course Code	**Course Title**													
LSCM 7001	**Operations Management**	**3**	**3**	**3**	**1**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**3**

1 – Weakly mapped
2 – Moderately mapped
3 – Strongly mapped

Model Question Paper

Name: **Enrolment No:**	UPES THE NATION BUILDERS UNIVERSITY

Course: LSCM 7001 – Operations Management

Programme: MBA (Power Management) **Semester: Even-2016-18**

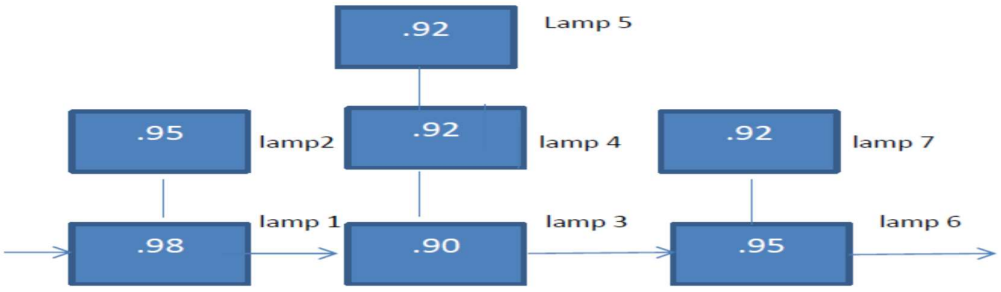
Time: 03 hrs. **Max. Marks: 100**

Instructions:

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

Section A (20)

Attempt all questions in this section

1.	1. (A) Write the full form of the following (a) DMAIC (b) DPMO (c) TOC (d) MRP (B) Explain the following (a) Throughput rate (b) MPS (c) FMS (d) Six sigma	**(2*4=8 marks)** **(3*4=12 marks)**	CO - 1, 2, 3, ,5
	SECTION B (20 Marks) **Attempt any 4 question, each question carries 5 marks only**		
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 Discuss the design process, its importance & the various stages of design process? (c) Define little's law? Describe an example that you have observed where little's law Applies? (d) What are the various types of process design? Explain with examples (e) Differentiate between make to order, make to stock & assemble to order?	**(5*4= 20 marks)**	CO 1, 2,4

SECTION C(30 marks)

(Attempt any 3 question, each question carries 10 marks only)

3. (a) Smart metering is a new startup that develops and markets smart meters. The company is currently located in Delhi & employs 15 people. Due to a strong growth, the company needs additional office space. The company has the option of leasing additional space at its current location in Delhi for the next two years, but after that will need to move to a new building. Another option the company is considering is moving the entire operation to a small town in Bhiwadi immediately. A third option is for the company to lease a new building in Delhi immediately. If the company chooses the first option & leases new space at its current location, it can, at the end of two years, either lease a new building in Delhi or move to the small town Bhiwadi

The following are some additional facts about the alternatives and current situation

1. The company has a 75% chance of surviving the next two years
2. Leasing the new space for two years at the current location in Delhi would cost $750000 per year
3. Moving the entire operation to Bhiwadi towm would cost $ 1million, leasing space would run only $500000 per year
4. Moving to a new building in Delhi would cost $200000, and leasing the new building's space would cost $650000 per year
5. The company can cancel the lease at any time
6. The company will build its own building in five years, if it survives
7. Assumes all other costs and revenues are the same no matter where the company is located

What should Smart Metering do?

3(b) Anik & Co. produces electric wires for state electricity department. Quality is not quite good as it could be at this point, but the selling price is low and Anik can study the market response while spending more time on R&D. At this stage, however Anik & co. needs to develop aggregate production plan for the next six months January through June. You have been commissioned to create the plan. The following information should help:

[10 x 3]

CO – 2, 3,4

	January	February	March	April	May	June	Total
Demand forecast	500	600	650	800	900	800	4250
Number of working days	22	19	21	21	22	20	125

Costs

Materials	$ 100/unit
Inventory holding cost	$ 10/unit/month
Marginal cost of stockout	$ 20/unit/month
Marginal cost of subcontracting	$ 100/unit
Hiring & training cost	$ 50/worker
Layoff cost	$ 100/worker
Labour hours required	4/unit
Straight time cost(first eight hours each day)	$12.5/hour

Inventory	
Beginning inventory	200 units
Safety stock required	0% of moth required

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

(a) Level strategy (b) subcontracting

3(c) The task shown in the following table identifies the work elements, time & immediate predecessors, management has designed an output rate of 192 units per 8 hours shift

Work element	Time(sec)	Immediate predecessors
A	40	none
B	80	A
C	30	D,E,F
D	25	B
E	20	B
F	15	B
G	120	A
H	145	G
I	130	H
J	115	

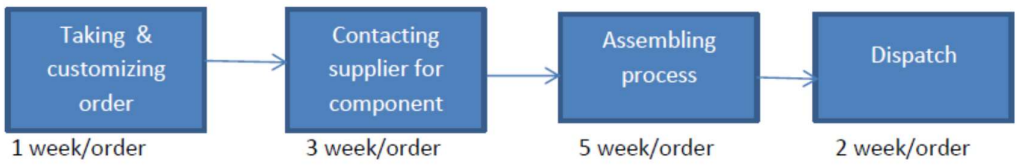
(i) What is the desired cycle time?

(ii) What is the theoretical minimum number of workstation?

(iii) Use a trial & error to work out a solution, and show your solution on a precedence diagram

(iv) What is the efficiency & balance delay of the solution found?

3(d) Jayant & company makes customized electric meter to order. They are analyzing the processes at their plant. The general flow of the process is shown below. There is a separate person working at each of the steps in the process



Jayant want to figure out the following for a typical 1 year(52 week)

(i) What is the current maximum output of the process?

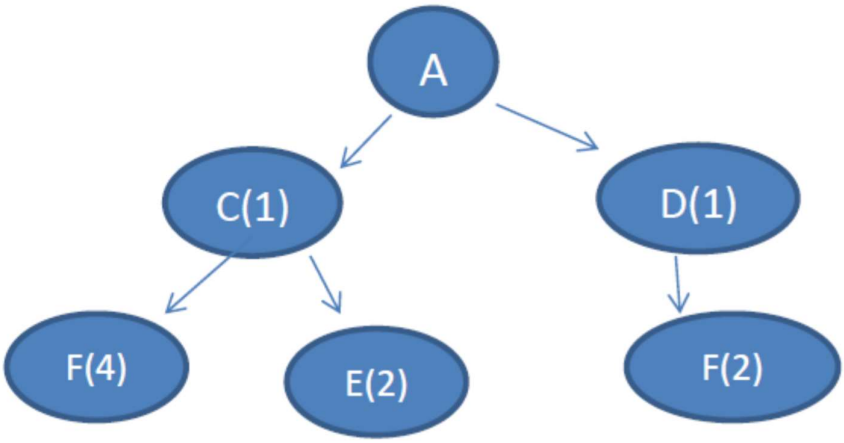
(ii) If we add another person, where would we add him or her & what is the benefit

(iii) If there is a benefit if we can shift 1 week from contacting supplier to customizing order? Assume we do not want make the change in part b above

(iv) Is there a benefit if we shift 1 week from assembling process to dispatch? Assume we do not make the change in part b & c above

SECTION D (30 marks)

Attempt the situation & provide the solution for this situation

4.	 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	[30]	CO-3

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