Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: Operations (& Materials) Management **Semester:** II
Program: BBA (LM / CORE / AIS) **Time:** 03 Hours
Course code: LSCM 2001 **Max. Marks:** 100
Instructions: Do as directed in the questions of respective sections.

SECTION A [20 Marks]

		Marks	CO
Q 1	Answer all the ten objective questions.		
(i)	In operations management, the term IPO model is frequently referred. What does IPO stand for?	[2]	1
(ii)	Mention two advantages of automation.	[2]	2
(iii)	The degree of customization is very high in _____type of production system. [Fill in the blank]	[2]	1
(iv)	JIT manufacturing is based on a push-type production planning system. [True / False]	[2]	2
(v)	Give an example of psychological transformation.	[2]	1
(vi)	Write the expanded form of AGVS and ASRS.	[2]	2
(vii)	_____ can be called as a waste. [select the right answer] Surplus material / Defective products / Both	[2]	2
(viii)	Dispatching is done in the _____ phase of PPC. [Select the right answer] Planning / Action / Control	[2]	2
(ix)	For a hospital, the surgical tools and equipment are _____. [Select the right answer] Inputs / Resources	[2]	1
(x)	_____ is the order size to minimize the total inventory cost. [Fill in the blank]	[2]	3

SECTION B [20 Marks]

Q 2	Answer any four of the following short questions.		
(i)	What are the types of facility layouts? Explain how each variety is suitable for a specific type of production?	[5]	2
(ii)	What are the seven wastes identified by TOTYOTA in their lean approach? Explain in brief.	[5]	2
(iii)	List the types of wastes. Explain how those are managed?	[5]	2
(iv)	What are the cost elements considered in the inventory management practices? Derive a formula for the 'economic ordering quantity' by using them.	[5]	4

(v) What is the difference between quality inspection and quality assurance? Whether TQM is governed by the quality inspection or quality assurance approach. [5] 4

(vi) Given the weekly demand information and weights, what is the weighted moving average forecast of the 5th period or week? [5] 4

Week	Demand	Periods	Weights
1	750	t-4	0
2	700	t-3	0.1
3	650	t-2	0.2
4	600	t-1	0.7

SECTION-C [30 Marks]

Q 3 Answer any <u>three</u> of the following long question.

(i) The Arkansas Cement Co. plans to locate a new production facility at either Little Rock, Fort Smith, or Jonesboro. Six location factors, factor weights and location scores are tabulated below. Which location is the best location according to the factor rating method? [10] 3

Sl. No.	**Location Factor**	**Factor Rating**	**Little Rock**	**Fort Smith**	**Jonesboro**
			Location score	Location score	Location score
1	Cost per ton	0.55	55.4	62.3	59.1
2	Labor availability	0.15	0.7	0.9	0.5
3	Local transportation	0.08	0.7	0.7	0.6
4	Union activities	0.15	0.8	0.4	0.9
5	Proximity to similar industry	0.05	0.8	0.8	0.4
6	Proximity to raw materials	0.02	0.7	0.8	0.5

(ii) Explain in details the ten functions of PPC. [10] 1

(iii) List and explain various types of production systems. [10] 1

(iv) If the inter-departmental transactions summary of a hospital is shown as below, prepare the best possible layout for its five departments. [10] 2

Inter-departmental Transactions Summary					
From / To	1	2	3	4	5
1	10	70	70	10	10
2	50	10	--	--	10
3	60	--	10	40	60
4	10	60	20	10	20
5	10	10	60	50	10

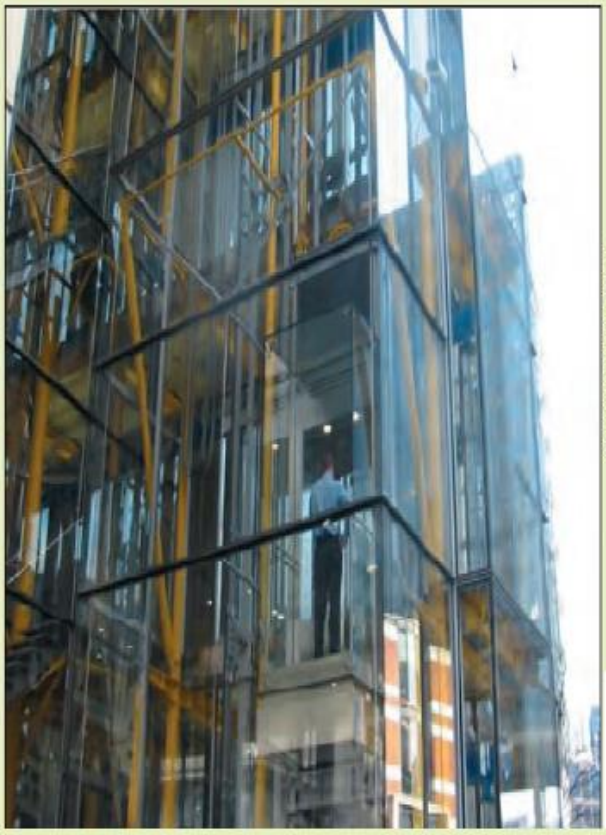
(v) Explain the use of seven quality control tools. [10] 4

SECTION-D [30 Marks]

Q 4	Answer the question related to the CASE after thorough reading and analysis.		

Short case **Lifting maintenance performance**

Back in 1853 Elisha Graves Otis introduced the world's first safety elevator in Yonkers, New York. It was to have a remarkable impact on the world's skylines. Without elevators, the skyscraping buildings that dominate most modern cities would probably never have been developed. Given the number of elevators in regular use throughout the world and the Otis Company's position as a leading supplier, Otis is the world's leading people mover. And Otis is very much aware that every time we enter an elevator we are trusting our lives to the people who designed and made it and, more immediately, the people who maintain it. Without effective maintenance the elevators which are often on duty every minute of every day would literally be death traps. Central to the Otis philosophy of maintenance is its 'Otis Maintenance Management System' (OMMS), a programme that takes into account its clients elevators' maintenance needs. Using this system Otis can customize inspection and maintenance schedules for up to 12 years of operation or 5 million trips in advance. Maintenance procedures are determined by each elevator's individual pattern of use.



Source: Courtesy of Greg McPartlin

Frequency of trips, the loads carried by the elevator and conditions of use are all incorporated to determine the frequency and nature of maintenance activities. Because no component part of any equipment is perfect, Otis also monitors the life cycle characteristics of all its elevators' components. This information on wear and failure is made available to its customers via its 24 communications centres and website. This ongoing understanding of component life also is used to update maintenance schedules.

With Otis's call service, when an elevator has a problem, a technician can be on their way to a customer's facility within minutes. Its twenty-four hours a day, seven days a week service handles over 1.2 million calls a year and can get the elevators back in service on average within two and a half hours. Also the Otis on-site monitoring equipment system is a sophisticated and interconnected system of sensors, monitors, hardware and software that collects, records, analyzes and communicates hundreds of different system functions. If the system detects a problem it automatically makes a service call, calling out a technician who has been provided with the information collected by the system which will be used to help identify the component causing the problem. '*Around-the-clock response is important*,' says Otis, '*because problems don't keep office hours . . .* (the remote sensing) *. . . system detects deteriorating components, identifies intermittent anomalies, notes the small nuisances that . . . would have gone undetected . . . It identifies most potential problems before they occur.*'

Questions

1 What could be the effects of failure in elevator systems? How does this explain the maintenance service that Otis offers its customers? [10]

2 What approach(es) to maintenance are implied by the services that Otis offers? [10]

3 How would you convince potential customers for these services that they are worthwhile? [10]

Source: Nigel Slack, Stuart Chambers and Robert Johnston, Ch. 19, Failure Prevention and Recovery, p.639-640, Operations Management, 5th Ed., Pearson Education Ltd.

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Instructions: Do as directed in the questions of respective sections.

SECTION A [20 Marks]

		Marks	CO
Q 1	Answer all the ten objective questions.		
(i)	Define and express the term 'productivity'.	[2]	1
(ii)	Mention two disadvantages of automation.	[2]	2
(iii)	The degree of customization is very low in _____type of production system. [Fill in the blank]	[2]	1
(iv)	JIT manufacturing is based on a pull-type production planning system. [True / False]	[2]	2
(v)	Give an example of physical transformation.	[2]	1
(vi)	Write the expanded form of CAD and CIM.	[2]	1
(vii)	Which types of production systems a sugar factory used to operate with? [Select the right answer] Job production / Batch production / Mass production	[2]	1
(viii)	The popular technique of project management, CPM stands for _____. [Fill in the blank]	[2]	2
(ix)	What are the three types of automation?	[2]	**2**
(x)	What are the three types of wastes?	[2]	2

SECTION B [20 Marks]

Q 2	Answer any four of the following short questions.		
(i)	What is a 'bill of materials'? Explain its importance in materials management.	[5]	4
(ii)	What are the seven wastes identified by TOTYOTA in their lean approach? Explain in brief.	[5]	2

<table>
<tr><td>(iii)</td><td>Given the weekly demand information and weights, what is the weighted moving average forecast of the 5th period or week?

<table><tr><td>Week</td><td>Demand</td><td>Periods</td><td>Weights</td></tr><tr><td>1</td><td>820</td><td>t-4</td><td>0</td></tr><tr><td>2</td><td>775</td><td>t-3</td><td>0.1</td></tr><tr><td>3</td><td>680</td><td>t-2</td><td>0.2</td></tr><tr><td>4</td><td>655</td><td>t-1</td><td>0.7</td></tr></table></td><td>[5]</td><td>4</td></tr>
<tr><td>(iv)</td><td>List and explain various types of automations in detailed.</td><td>[5]</td><td>2</td></tr>
<tr><td>(v)</td><td>List and explain how different factors influence the decision of selecting a facility location.</td><td>[5]</td><td>2</td></tr>
<tr><td>(vi)</td><td>With the following data pertaining to two locations and their factors, decide which one is better?

<table><tr><td>Sl. No.</td><td>Factors</td><td>Weightage</td><td>Rating of Location-A</td><td>Rating of Location-B</td></tr><tr><td>1</td><td>Facility utilization</td><td>25</td><td>3</td><td>5</td></tr><tr><td>2</td><td>Total service turnover</td><td>25</td><td>4</td><td>3</td></tr><tr><td>3</td><td>Scope for rush orders</td><td>25</td><td>3</td><td>3</td></tr><tr><td>4</td><td>Land and construction coast</td><td>15</td><td>1</td><td>2</td></tr><tr><td>5</td><td>Employee availability</td><td>10</td><td>5</td><td>3</td></tr></table></td><td>[5]</td><td>3</td></tr>
<tr><td colspan="4">SECTION-C [30 Marks]</td></tr>
<tr><td>Q 3</td><td>Answer any <u>three</u> of the following long question.</td><td></td><td></td></tr>
<tr><td>(i)</td><td>The following information is available on 3 vendors: A, B and C. Using the data below, and assigning 40 for quality and 30 weights to service, determine the best source of supply.
Vendor A: Delivered ‘56’ lots, ‘3’ were rejected, ‘2’ were not according to the schedule.
Vendor B: Supplied ‘38’ lots, ‘2’ were rejected, ‘3’ were late.
Vendor C: Finished ‘42’ lots, ‘4’ were defective, ‘5’ were delayed deliveries.</td><td>[10]</td><td>4</td></tr>
<tr><td>(ii)</td><td>Explain the 10 R’s or ten right practices adopted in materials purchasing.</td><td>[10]</td><td>4</td></tr>
<tr><td>(iii)</td><td>List and explain various types of plant layouts.</td><td>[10]</td><td>2</td></tr>
<tr><td>(iv)</td><td>Martha’s Meter Market is a retail outlet which deals exclusively with weather equipment. Currently MMM is trying to decide its inventory policy for home barometers. Barometers cost $50 each and demand is about 500 per year distributed fairly evenly throughout the year. Ordering cost is $80 per order and holding cost is figured out to 20% of the cost of the item.
a) What is the economic ordering quantity?
b) How many times would MMM place order in a year?
c) What is the resulting total annual inventory cost?</td><td>[10]</td><td>4</td></tr>
<tr><td>(v)</td><td>Explain the use various quality tools in the production shop floors.</td><td>[10]</td><td>4</td></tr>
</table>

SECTION-D [30 Marks]

Q 4	Answer the question related to the CASE after thorough reading and analysis.		

Short case **BA at Waterside**

Waterside is British Airways' state-of-the-art complex and training centre, designed by architect Niels Torp. The complex comprises six buildings arranged along a common spine called 'the Street'. They all have their own outward-facing courtyards and are linked by the Street which creates a 'mall' or 'village' atmosphere with trees and fountains, coffee shops and restaurants surrounded by glass-walled offices, walkways and lifts. In the open-plan offices cabin crew and customer service staff (the 'uniforms') are brought together with product developers, strategists and sales staff (the 'suits'). All the furniture and equipment in the buildings are the same, so office moves are simple. Many desks are shared and these 'hot desks' can be booked by staff as and when required. PIN numbers provide access to the telephone networks and personal-style telephone numbers and, like the computer links, they can be accessed from any desk. Likewise, cordless phones can be taken and used around the building. More transient staff – sales staff, for example – are provided with 'touch-down points' where they can use a phone or computer or plug in their own laptop.

Source: British Airways

Efficient use of space also comes from 'club' areas where employees can work informally in a lounge setting. Diaries and training manuals are all computerized and accessible throughout the building. The idea is to create a relaxed atmosphere which encourages interaction, communication and teamwork. Hours of work are flexible, with employees judged on their output rather than attendance. *'Staff should enjoy the experience of being here,'* says a company spokesperson, *'whether they are in the building all of the time or call in once a week. It is an informal environment. People can see and meet others who work in different departments. In the old building, it was different. People worked in their own rooms and had their own space. If you went to visit them it was like going onto someone else's territory. The way we operate here is not only more transparent, it is more efficient.'*

Questions

1 How might this way of working improve quality and flexibility? [10]

2 How might processing costs be affected? [10]

3 What do you think might be the disadvantages of this type of working? [10]

Source: Nigel Slack, Stuart Chambers and Robert Johnston, Ch. 9 Job design and work organization, p.277-278, Operations Management, 5th Ed., Pearson Education Ltd.

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