Roll No: ----------

UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B tech PIE	**Semester – VII**
Subject (Course): Facilities planning and materials handling	**Max. Marks : 100**
Course Code : IPEG411	**Duration : 3 Hrs.**
No. of page/s: 3	

SECTION A

Answer the following questions (4*5)

1. Enlighten the major advantages of overhead travelling crane? (CO5)
2. Highlight the limitations of hand operated hoisting equipment? (CO5)
3. Justify the use of an escalator/lift during material handling? (CO1)
4. Compare the differences between ALDEP and CORELAP.

SECTION B

Answer the following questions (4*10)

5. Can it be designed to have a rope drive alone for a push and pull arrangements in a conveyor mechanism? Discuss in detail. (CO5)
6. Discuss the need of computerized planning Facilities in plant layout with example. (CO4)
7. Illustrate the major principles of material handling system. Mention its significance. (CO1)
8. Explain the various Layout algorithms used during plant layout improvement/construction.

OR

Explain the physical facilities required in industry/factory with examples. (CO3)

SECTION C

Answer the following questions (2*20)

9. Suppose a manufacturing unit has two plants at location *X* and *Y*. These plants ship the parts to five distribution centers namely *A, B, C, D,* and *E*. These distribution centers, in turn, supply to retail outlets. The cost of transportation of a single part varies from manufacturing unit to distribution center. Table 2 provides the information of per unit cost from various sources to various destinations. For example, from plant *X* to distribution center *A,* the unit cost of transportation is Rs.30 per unit. Moreover, table 1.Also provides the information regarding the capacity of manufacturing units and demand of various distribution centers. (C04)

Table 1: Per-unit cost between various sources and destinations

	A	*B*	*C*	*D*	*E*	Capacity	
Plant *X*	Rs.30	Rs.25	Rs.35	Rs.34	Rs.41	1000	
Plant *Y*	Rs.32	Rs.28	Rs.32	Rs.42	Rs.40	1000	
Demand	500	700	300	400	600	2000	2500

Since, the demand is more than the supply, the company is planning to install another unit with a capacity of 500 units at different location to reduce the transportation cost as well as to meet the demand. Two new locations *Z* and *T* are possible. The per unit transportation cost from plants *Z* and *T* is given in table 2. Which location the company should opt for, so that the transportation cost is minimum?

Table 2: Per-unit Transportation cost between sources and destinations

	A	*B*	*C*	*D*	*E*	Capacity
Plant *Z*	Rs.25	Rs.21	Rs.32	Rs.28	Rs.37	500
Plant *T*	Rs.30	Rs.25	Rs.28	Rs.40	Rs.39	500

10. Consider the following layout problem with unit cost matrix (as in table 2).Use CRAFT algorithm to obtain **feasible layout** and also find out the better option for inter departmental interchange within the layout). The initial layout is shown in table 1 & the flow matrix in table 3

7 7

A	B	7
C	D	7

7 7

Table 1 Initial Layout

Assume the unit cost per Transfer to be 1

Depart ment	A	B	C	D
A	----	30	25	45
B	20	---	15	20
C	10	20	--	10
D	100	10	5	----

Table: 2.Flow Matrix

Depart ment	A	B	C	D
A	0	7	14	7
B	7	0	7	14
C	14	7	0	7
D	7	14	7	0

Table 3: Distance matrix

OR

(i) Prepare guidelines for the effective utilization of material handling equipment with an example

(ii) How to develop and analyze plant layouts using manual and computer aided software methodologies. Quote a proper and relevant industrial example. (CO4)