

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Programme Name: B tech ADE/PIE

Semester : VII

Course Name : Facility planning and material handling

Time : 03 hrs.

Course Code : IPEG 411

Max. Marks: 100

Nos. of page(s) : 3

Instructions: Assume the suitable missing data.

SECTION A

S. No.		Marks	CO
Q 1	How is the break-even concept used in plant location decision	4	CO 2
Q 2	Highlight the type of expertise that planning engineer should have to discharge his duties in developing a layout.	4	CO 3
Q 3	State the different ways of expanding a plant and give their PROS and CONS.	4	CO 2
Q 4	What are the various functional areas to be considered in factory layout design?	4	CO 3
Q 5	“Activity relationship and space requirements are used as a foundation for facility planning”. Justify the statement.	4	CO 1

SECTION B

Q 6	<p>A company wishes to build a new plant in a country location. The following data are given.</p> <table border="1"><thead><tr><th>Part no.</th><th>Volume (Pieces/year)</th><th>Bulk Factor (Pieces/ load)</th><th>Sequence of operations</th></tr></thead><tbody><tr><td>1</td><td>6000</td><td>30</td><td>A, B, C, D, E</td></tr><tr><td>2</td><td>10000</td><td>200</td><td>A, C, B, D, E</td></tr><tr><td>3</td><td>600</td><td>30</td><td>A, B, E</td></tr><tr><td>4</td><td>3000</td><td>600</td><td>A, C, D, E</td></tr></tbody></table> <p>Determine the optimum arrangement of the departments. Each department requires equal area and diagonal aisles are prohibited. The measure of effectiveness should be the total distance travelled.</p>	Part no.	Volume (Pieces/year)	Bulk Factor (Pieces/ load)	Sequence of operations	1	6000	30	A, B, C, D, E	2	10000	200	A, C, B, D, E	3	600	30	A, B, E	4	3000	600	A, C, D, E	10	CO4
Part no.	Volume (Pieces/year)	Bulk Factor (Pieces/ load)	Sequence of operations																				
1	6000	30	A, B, C, D, E																				
2	10000	200	A, C, B, D, E																				
3	600	30	A, B, E																				
4	3000	600	A, C, D, E																				
Q 7	Explain with suitable example the effect of social, legal, and political factors on selection of plant location	10	CO 2																				
Q 8	Consider the following layout problem with unit cost matrix. Use CRAFT algorithm to	10	CO 4																				

obtain layout. The initial layout is shown in table 1.1 & the flow matrix in table 1.2. Assume the unit cost per Transfer to be 1.

Table 1.1

10 10

Table 1.2

A	B	10	Depart ments	A	B	C	D	
D	C			10	A OR	---	40	35
Identify the characteristics of product and process layouts and their needs in terms of materials handling.				B	30	---	25	30
				C	20	SECTION-C	---	20
				D	120	20	10	---

Q 9 Explain briefly (i) Material handling in process layout and (ii) Material handling in product layout.

10 CO 5

Q 10 You have been entrusted to improve the facilities design (plant layout and material handling) of a manufacturing plant.
 a) State the areas of the manufacturing plant that have the greatest opportunity for the improvement. Expan briefly.
 b) Explain the systematic procedure you would follow to accomplish your objectives.
 c) State the nature of the data or information you would require to solve the problem and the specific techniques you would employ.

20 CO5

Q 11 An analysis of 50 parts processed on four machines has been summarized in the From-to chart of the following table.
 Additional information is that 50 parts enter the machine grouping at machine 3, 20 parts leave after processing at machine 1, 30 parts leave after machine 4. Determine a logical machine arrangement using Hollier method .Draw the flow diagram and also find out the Percentage of in-sequence

20 CO 5

	TO	1	2	3	4
FROM	1	0	5	0	25
	2	30	0	0	15
	3	10	40	0	0
	4	10	0	0	0

OR

From the following data, select the most advantageous location for setting a plant for making transistor radios.

	Site X	Site Y	Site Z
	Rs.	Rs.	Rs.
(i) Total initial investment	2,00,000	2,00,000	2,00,000
(ii) Total expected sales	2,50,000	3,00,000	2,50,000
(iii) Distribution expenses	40,000	40,000	75,000
(iv) Raw material expenses	70,000	80,000	90,000
(v) Power and water supply expenses	40,000	30,000	20,000
(vi) Wages and salaries	20,000	25,000	20,000
(vii) Other expenses	25,000	40,000	30,000
(viii) Community attitude	Indifferent	Want business	Indifferent
(ix) Employee housing facilities	Poor	Excellent	Good