

1. It is an adaptation of the familiar mileage chart appearing on most road maps which normally contains numbers representing some measure of the material flow between two machines, departments, buildings, or sites.
(1 Point)

- Flow Process Chart
- Multiproduct Process Chart
- Flow Diagram
- From-To Chart

2. It is obtained by dividing the usable cube by the exterior envelope of the container. (1 Point)

- Container Nesting Ratio
- Container Space Utilization
- Trailer Space Utilization
- Storage Space Efficiency

◆ Container space utilization:


- Divide the usable cube by the exterior envelope of the container.

3. It is determined by dividing the overall container height by the nested height. (1 Point)

- Container Nesting Ratio
- Container Space Utilization
- Trailer Space Utilization
- Storage Space Efficiency

◆ The container nesting ratio:

- Divide the overall container height by the nested height:

4. Which of the following is not a characteristic of product layouts? (1 Point) 

Standardized product

High material handling costs

Sequential arrangements of machines

Continuous production system

Clear my choice

5

Create manufacturing cells based on the machine-part matrix below.

Part #	Machine #				
	1	2	3	4	5
1			1		1
2	1				
3	1	1		1	
4			1		1
5				1	
6	1	1			

- a. cell 1{M1, M3, M4}, cell 2{M2, M5},
- b. We can have two separate cells, there is a bottleneck machine.
- c. cell 1{M3, M5}, cell 2{M1, M2, M4},
- d. cell 1{M1, M4}, cell 2{M2, M3, M5},
- e. None of the mentioned
- f. cell 1{M2, M3, M4}, cell 2{M1, M5},
- g. cell 1{M1, M3}, cell 2{M2, M4, M5},

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My courses

FACILITIES PLANNING AND MATERIAL HANDLING / جميع الشعب

General

Facilities Final Ex

Time left 0:54:05

Question 1

Not yet answered

Marked out of 1.00

Flag question

In fixed product type layout there is little flow of personnel and equipment, but an increased flow of material through the facility.


Select one:

True

False

F

(العكس)


6. The total number of containers along the length and width of the trailer and the container stacked vertically 
(1 Point)

- Container Nesting Ratio
- Container Space Utilization
- Trailer Space Utilization
- Storage Space Efficiency

7. The quantity of equipment required for an operation
(1 Point)

- Equipment Effectiveness
- Equipment Fraction
- Equipment Efficiency

?

7. The quantity of equipment required for an operation 
(1 Point)

Equipment Effectiveness

Equipment Fraction

Equipment Efficiency

Equipment Planning



*
سوال
بہتر

8. The arrangement of all equipment, machinery, and furnishings within the structure (1 Point)

- Facility Planning
- Facility Location
- Layout Design
- Handling System Design


Layout – consists of all equipment, machinery, and furnishings within the building envelope.

9. It determines how an activity's tangible fixed assets best support achieving the activity's objectives.
(1 Point)


- Facility Planning
- Facility Location
- Layout Design
- Handling System Design

Slides ↴

› *Facilities planning* determines how an activity's tangible fixed assets best support achieving the activity's objective.

10. Cellular layout is a type of layout which – 
(1 Point)

- Groups machines into department according to their function
- Groups machines into small assembly lines that produce families of parts
- Allows production of larger lots by reducing set-up time
- Encourages the use of larger and efficient machinery

11. It consists of the mechanism by which all interactions required by the layout are satisfied e.g. materials, personnel, information, and equipment handling systems. 
(1 Point)

Structure Design


Handling System Design


Layout Design

Facility Location

12. Machines within a manufacturing cell are organized by –
(1 Point)

- CORELAP
- Relationship Diagramming
- Direct Clustering Algorithm
- Block Diagramming

13. It establishes the prerequisite assembly steps that must be completed before performing a given assembly step 
(1 Point)

Operation Process Chart 

Precedence Diagram


Assembly Chart

Route Sheet

Facilities Planning)

13. It establishes the prerequisite assembly steps that must be completed before performing a given assembly step
(1 Point)

- Operation Process Chart
- Precedence Diagram
- Assembly Chart
- Route Sheet


15. It contains the information concerning the structure of the product. 
(1 Point)

Parts List

Bill of Materials *Bill of Material*

Assembly Chart

Engineering Drawing

16. It summarizes whether a part will be purchased or produced, how the production of a part will be achieved, what equipment will be used, and how long it will take to perform each operation. 
(1 Point)

- Operation Process Chart
- Precedence Diagram
- Assembly Chart
- Route Sheet


18. The spaces required for the serving lines and cafeteria?
(3 Points)

5400

5,100

4800

1500

19. The spaces required for the full kitchen and cafeteria? 
(3 Points)

1,200

2,700

7,800

6,300


19. The spaces required for the full kitchen and cafeteria?
(3 Points)

1,200

2,700

7,800

6,300

23. The tree flow pattern is utilized in facilities that utilize robotic-type parts from workstation to workstation 
(2 Points)



True




False



tree flow
tree flow pattern is utilized in facilities that utilize robotic-type material handling for moving parts from workstation to workstation
(āhār. 2)

True

False

24. Material handling system should be well planned and designed before the facility layout planning starts in order to gather critical information necessary to make appropriate layout decisions. 

(2 Points)

True

False

slides ↷

◆ Which comes first, *the material handling system* or the *facility layout*?



◆ **BOTH!** The layout and the handling system should be designed simultaneously

25. The Jelo Motor Company, motors are produced in a three-stage process. Motors are inspected following each stage with percentage yields of good quality in process units as follows:

Stage	<u>Average Percentage Good Quality</u> $\longrightarrow = (1 - \text{defect})$
1	0.96
2	0.98
3	0.95

The company wants to know the daily product yield for product input of 250 units per day. (3 Points)

263

238

223


280

$$\frac{250}{.96 \times .98 \times .95} = 279.71$$

26. Refer to problem no. 25, how many input units it would have to start with each day to result in a final daily yield of 250 good quality units?

(3 Points)

- 263
- 238
- 223
- 280

27. Dason Plastics manufacturer must acquire some molding machines capable of producing 160,000 good parts per year. They will be installed in a production line that normally produces 20 percent rejects because of the tight aerospace specifications. Assume that it takes 90 seconds to mold each part and the plant operates 2,000 hours per year. If the molding machines are used only 50 percent of the time and are 90 percent efficient, how many molding machines would be required? 

(3 Points)

- 4
- 6
- 8
- 12

28. Assume your manager ask you to design 70° double loaded, two-way traffic parking space (W4) where Module width for standard car is 57 feet and stall depth of 18 feet. Then stall width will be

angle

Module width
for standard

SD=18

SW


(3 Points)

- 8 feet 0 inches
- 8 feet 6 inches
- 9 feet 0 inches
- 9 feet 6 inches

$$\theta = 70$$

Module width = 57
for standard

from the table
PW = 9'

29. Refer to problem no. 28, parking width will be: 
(3 Points)

$$PW = \frac{SW}{\sin \theta} = \frac{9}{\sin 70^\circ} = 9.5775$$

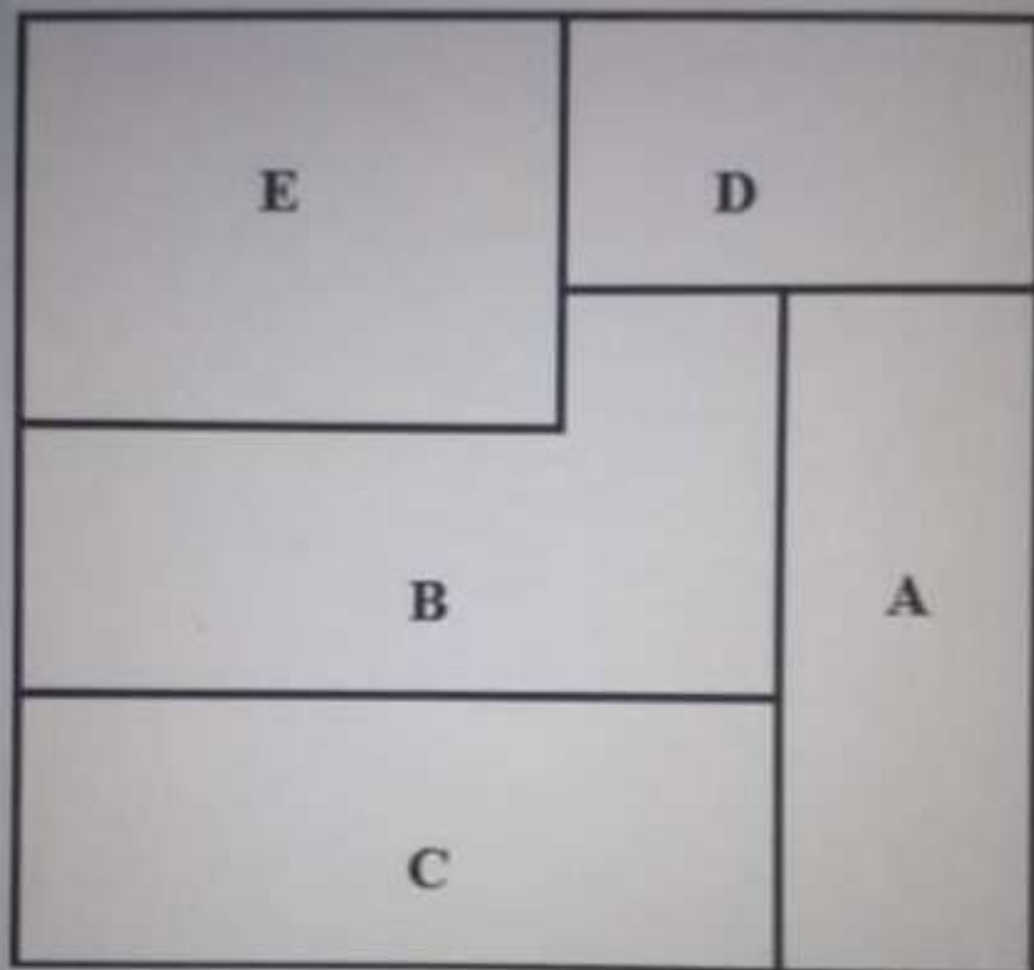
8.467 feet

9.053 feet

9.578 feet

60.66 feet

Given the recommended layout for a new facility and the weekly flow between departments A, B, C, and E. The normalized Adjacency score (relative efficiency) the layout is:



	A	B	C	D	E
A	---	350	250	250	
B		---	350	300	400
C			---		150
D				---	450
E					---

It determines how an activity's tangible .9
fixed assets best support achieving the
activity's objectives
(1 نقطة)


Facility Planning

Facility Location

Layout Design

Handling System Design

Facilities planning determines how an activity's tangible fixed assets best support achieving the activity's objective.

10. Cellular layout is a type of layout which – 
(1 Point)

- Groups machines into department according to their function
- Groups machines into small assembly lines that produce families of parts
- Allows production of larger lots by reducing set-up time
- Encourages the use of larger and efficient machinery

Time left 0:31:29

In designing a health service area, assume that the facility has employed four nurses and two part time physician, then the area required for the waiting room is ----- ft squared.

Answer:

waiting room → 75 ft² for first nurse + 25 ft² per additional nurse
 = 75 + 25 + 25 + 25
 = **150 ft²**

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Time left 0:25:20

Question 16
 Not yet answered
 Marked out of 1.00
 Flag question

using the graph based procedure, and given the material flow matrix for the five equal sized departments (A, B, C, D, E) the first three nodes added to the graph are: -----

		To				
		A	B	C	D	E
From	A	—	10	20	35	15
	B		—	50	15	5
	C			—	10	10
	D				—	20
	E					—

	B	C	Sum
A	10	20	30
D	15	10	25
E	5	10	15

a. (departments B and C), then department A
 b. (departments B and C), then department D
 c. (departments B and C), then department E
 d. all of the above are correct

Clear my choice

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FACILITIES PLANNING AND MATERIAL HANDLING

My courses FACILITIES PLANNING AND MATERIAL HANDLING General Final exam (June 2021)

Time left 0:31:10

Question 15
 Not yet answered
 Marked out of 1.00

In the CRAFT, you can exchange the location of two equal area departments even if the departments are not adjacent.

Select one:
 True
 False

T

Next page

Time left 0:37:46

Given the following dimensions of a particular type of plastic reusable containers:
 Inside dimensions 19"x 10"x11"
 Outside dimensions 20"x12"x12"
 Each nested container 20"x12"x3"
 A trailer inside dimension 260"x120"x120"
 Containers are not palletized. Assume no clearance is needed between containers, and between containers and the walls of the trailer
 the container nesting ratio is equal to -----

a. 2
 b. 3
 c. 4
 d. 5

$\frac{12}{3} = 4$

Time left 0:44:23

Given the following dimensions of a particular type of plastic reusable containers:
 Inside dimensions 19"x 10"x11"
 Outside dimensions 20"x12"x12"
 Each nested container 20"x12"x3"
 A trailer inside dimension 260"x120"x120"
 Containers are not palletized. Assume no clearance is needed between containers, and between containers and the walls of the trailer
 the trailer return ratio is equal to -----

a. 3
 b. 4
 c. 3.6
 d. 3.7
 e. 3.8
 f. none of the above is correct

1 2 3 4 5
 7 8 9 10 11
 13 14 15 16 17
 19 20 21 22 23
 25 26
 Finish attempt ...

using the graph based procedure, and given the material flow matrix for the five equal sized departments (A, B, C, D, E)
 the first three nodes added to the graph are : -----

		To				
		A	B	C	D	E
From	A	-	10	20	35	15
	B		-	50	15	5
	C			-	10	10
	D				-	20
	E					-

Question 5

Not yet answered

Marked out of 2.00

Flag question

Based on the relationship chart below, the recommended layout is:

Dept. No.	Sq. Feet	Dept. Desc.
1	3,500	Administration
2	2,600	Social Services
3	2,400	Institutions
4	1,600	Accounting
5	1,500	Education
6	3,400	Internal Audit

Dept. No. 1 2 3 4 5 6

Sq. Feet 3,500 2,600 2,400 1,600 1,500 3,400

Dept. Desc. Administration Social Services Institutions Accounting Education Internal Audit

- a.
- | | |
|---|---|
| 4 | 6 |
| 1 | 5 |
| 2 | 3 |
- b.
- | | |
|---|---|
| 6 | 4 |
| 1 | 5 |

False

37/61

For the two way pallet, the fork entry can be only on two opposite sides of the pallet and is perpendicular to the

Select one:

True

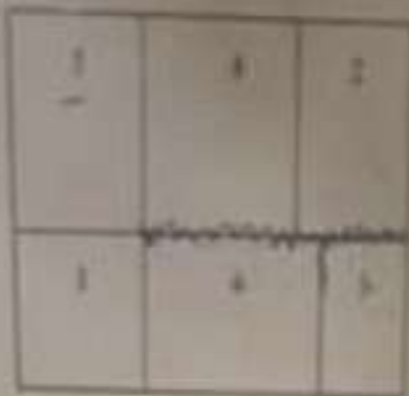
False

◆ Two-way pallet: the fork entry can be only on two opposite sides of the pallet and is parallel to the stringer side.

Question 1: Carefully read the next statements and place True for those you agree with and False for those you do not. (10 points)

1.	If the operator walks between two operating machines, then a minimum of a 45-inch aisle is needed.	✓	X
2.	The tree flow pattern is utilized in facilities that utilize robotic-type material handling for moving parts from workstation to workstation.	✓	✓
3.	Aisle should be straight with minimal curves, right angle intersections, and dead ends.	X	X
4.	Exploded parts photograph is a photograph which includes all the detailed information on the product as dimensions, materials and whether the part is going to be produced in house or outsourced	✓	X
5.	Based on volume-variety chart, or Pareto chart the facilities plan should consist of a mass production area for the 15% of high-volume items and a job shop arrangement for the remaining 85% of the product mix.	X	X
6.	<u>Departmental area requirements</u> are the sum of the areas of the individual workstations.	✓	X
7.	For the process layout, product design changes cause the layout to become obsolete.	X	X
8.	For the Relationship chart, two departments can be placed adjacent to each other with a relationship value U, but they cannot be placed adjacent to each other with a relationship value X.	✓	✓
9.	A production system in which inventory is "pulled" from preceding processes tends to require a larger work-in-process inventory than a system in which inventory is "pushed" to the next processes.	X	X
10.	lean production uses a push system to control material flow in a production system	X	X
11.	Flexible facilities are easily being altered to handle a variety of requirements.	✓	X
12.	For the operation process chart, components are represented with a four-digit code starting with 0.	✓	X
13.	Product, process, schedule, and facilities design decisions are made independently and sequentially.	✓	X
14.	Production methods are the most fundamental factor affecting the physical layout.	✓	✓
15.	In <u>product layout</u> departments, there is little flow between the workstations, because flow occurs mostly between workstations and aisles.	X	X
16.	End-to-end, back-to-back patterns are indicative of process departments where <u>one operator</u> works at each workstation.	✓	X
17.	Precedence diagrams are needed for each component part.	X	X
18.	High work in process is a more likely characteristic for a <u>product layout</u> than for a <u>process layout</u> .	✓	X
19.	A push system means providing the next station with exactly what is needed when it is needed.	X	X
20.	Tree Diagram is used to map the logical links among related items, trying to identify which items impact others the most.	✓	X

Question 2: Determine the efficiency rating for the block layout shown below, given the closeness ratings between pairs of departments in the table at the right of the layout. Use the following numerical values for closeness ratings: A = 10, E = 5, I = 4, D = 2, D = 0, E = -5. (2 points)



		To			
		1	2	3	4
From	1	—	0	2	4
	2		—	5	4
	3			—	4
	4				—
	5				
	6				

Each pair (1)

$$Z = \frac{\sum f_{ij} x_{ij} - \sum f_{ij} (1 - x_{ij})}{\sum f_{ij} - \sum f_{ij}} = \frac{18 - (-5)}{46 - (-5)}$$

~~+~~ + flow = $\sum f_{ij} x_{ij}$

$$= (2 \times 0) + (5 \times 0) + (4 \times 1) + (4 \times 1) + (4 \times 1) + (10 \times 0) + (5 \times 0) + (6 \times 1)$$

$$= 18$$

- flow = $\sum f_{ij} (1 - x_{ij})$

~~$= 5(1 - 1) - 5(1 - 1) - 5(1 - 0)$~~

~~$= -5$~~

$$= -5(1-1) - 5(1-1) - 5(1-0)$$

$$= -5$$

+ flow = $\sum f_{ij}$

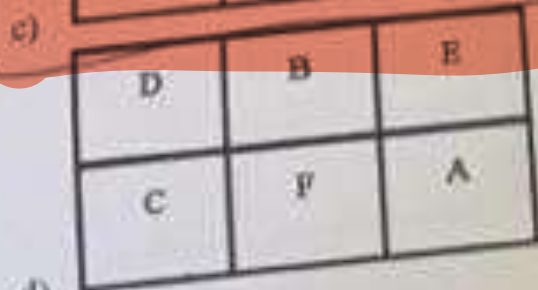
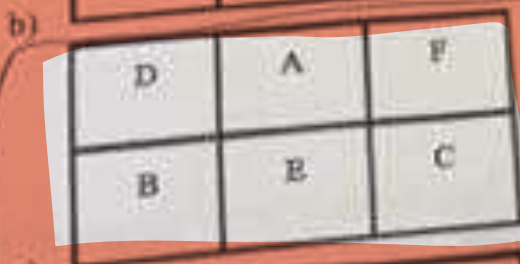
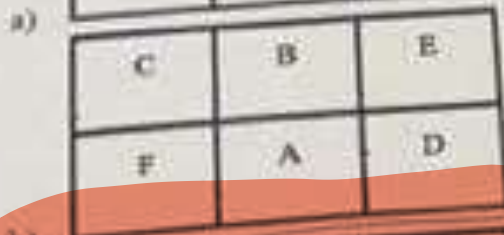
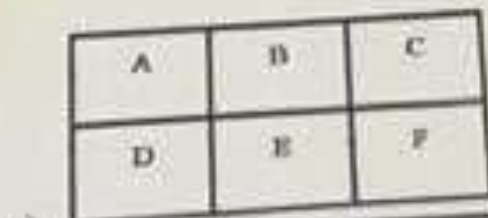
$$\sum f_{ij} = 2 + 6 + 4 + 4 + 4 + 10 + 10 + 6 = 46$$

- flow = $\sum f_{ij}$

$$2f_{ij} = -5 - 5 - 5 = -15$$

Q5: Based on the from-to-chart that shows the flow between departments (see table below), what is the best layout of your building that will minimize nonadjacent load? Justify your answer. (2 points)

From/To	A	B	C	D	E	F
A		15	50			125
B	20				75	
C	50				120	120
D						
E		50	100			
F	110		100			



©

Question 2: MULTIPLE CHOICES: circle around the correct answer. (9 points)

1. All of the following reduce the space requirements at the facility except:

- a. products are delivered to the points of use in smaller lot and unit load sizes.
- b. **centralized storage areas are used.**
- c. products are pulled from preceding processes using kanbans.
- d. more efficient layout arrangements (i.e., manufacturing cells) are used.
- e. None of the mentioned

2. All of the following are properties of using Fixed Product Layout except:

- a. Material movement is reduced.
- b. **Personal and equipment movement is minimized.**
- c. Highly flexible; can accommodate changes in product design, product mix, and production volume.
- d. None of the mentioned

3. To developing activity relationships, if there are 12 departments, then the number of pairwise combinations must be considered is:

- a. 13
- b. 132
- c. 156
- d. **66**
- e. 78
- f. None of the mentioned

$$\frac{12 \times 11}{2} = 66$$

4. The communications within materials management systems include all of the following except:

- a. **Production schedules**
- b. Inventory records
- c. Purchase order
- d. Move tickets
- e. Electronic data Interchange (EDI)
- f. Kanbans

5. The resources of materials management systems include all of the following except:

- a. The production control and purchasing functions
- b. The vendors
- c. The transportation and material handling equipment required to move the materials, parts, and supplies
- d. The receiving, storage, and accounting functions
- e. **The customer**
- f. None of the mentioned

1. What is the number of department pairs that will be considered for exchange that satisfy exchange requirements? (1 point)

2. What is the cost of the initial layout? (2 points)

3. What is the estimated layout cost assuming that departments 1 and 2 are exchanged? (1 point)

4. What is the estimated layout cost assuming that departments 1 and 4 are exchanged? (1 point)

5. What is the actual layout cost assuming that departments 1 and 2 are exchanged? (2 point)

6. What is the estimated layout cost assuming that departments 2 and 3 are exchanged? (1 point)
7. What is the actual layout cost assuming that departments 2 and 3 are exchanged? (1 point)