EX/PROD/T/314/2019

B.PRODUCTION ENGINEERING EXAMINATION,2019.

(3rd Year, 1st Semester)

PLANT LAYOUT AND PRODUCT HANDLING

Time: 3hrs. **Full marks: 100.**

(Attempt any one from (a), (b) and (c) in Question-1.)

1.(a) Describe the following charts and diagrams and state their applications

In layout planning: (i) REL diagram;
(ii) space-Relationship diagram;
(iii) From-To Chart. (3X5=15)

(b) Briefly **explain** the following type of layouts stating their characteristics and applications with **neat sketches**:

(i) Fixed /Static layout; (iii) Product layout;
(ii) Group/Cellular layout; (3X5=15)

(c) From the given **REL-Chart** as shown in **FIGURE-1**,

(i) Evaluate the **TCR** of all the departments;
(ii) Construct activity relationship diagram. (7+8=15)

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(Attempt any two from (a), (b), (c) and (d) in Question-2.)

2.(a) From the given **REL Chart** as shown in **FIGURE-2**, make a layout using **CORELAP**. (20)

(b) Based on the data given in **FIGURE-3 (i),(ii) and (iii),** Use the **CRAFT** pairwise interchange techniques to obtain the final **CRAFT layout,** Department **C and E** are to be **fixed** in location. (20)

(c) Use **ALDEP** procedure to **determine the Layout vector, Construct** and **evaluate the layout** for the facility based on the **REL Chart** as shown in **FIGURE-4**, with the department dimensions. The dimensions of the facility are **10X18**. Use the **sweep width of 2** and the **minimum acceptable** level of importance '**E**'. The **closeness values : A=64, E=16, I=4, O=1, U=0** and **X=-1024**. (20)

(Attempt any two from (a), (b) and (c) in Question-3.)

3.(a) (i) **Draw neat sketch** of a **Suction type Pneumatic conveying** system and **explain** its operation. Explain the significance of "**pick up velocity**". (8)

(ii)**Discuss** the **advantages** and **applications** of a **Hydraulic conveying System.** (7)

(b) **Discuss** the operation and **application** of the following product handling equipments:

(i) Upward Roller Conveyor;

(ii) **Screw Conveyors**;

(iii) **Belt Conveying System**. (3X5=15)

(c) (i) **Draw neat sketch** of a **centrifugal discharge** type **Bucket Elevator** and explain the method of loading and unloading. (7.5)

(iii) With the help of **neat sketches explain** the operation of **Roller Conveyors.** (7.5)

(Attempt any one from (a) and (b) in Question-4.)

4.(a) (i) What is an **AGVS**? Explain its **routing system** (7)

(ii) Briefly explain the **different** methods of **Automated** Workpart Transfer. (8)

(b) (i) State **and explain** the principles of **product handling**. (7)

(ii) **Discuss** how **Robots** are applied in **different product** Handling application. (8)

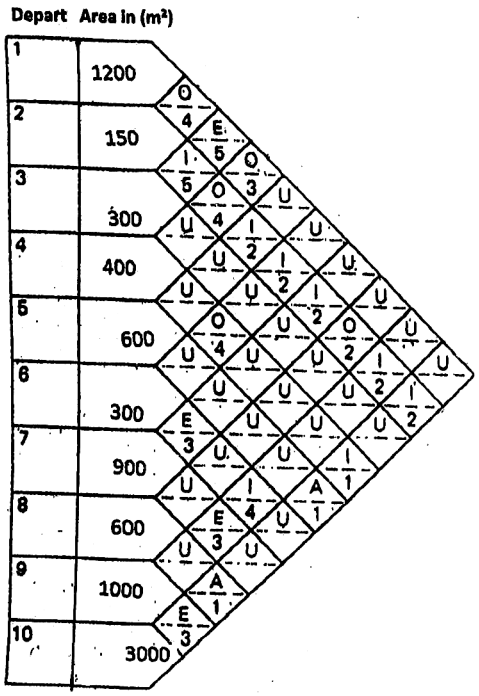


FIGURE- 1.

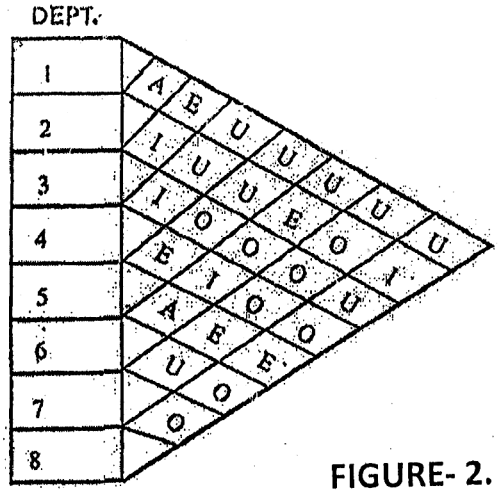
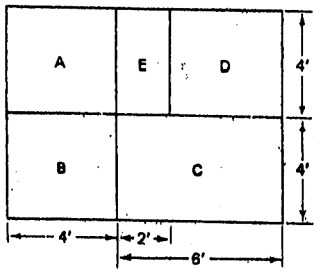


FIGURE- 2.



Initial Layout (i)

To / From	A	B	C	D	E
A		1	2	2	0
B	0		2	0	0
C	2	0		0	0
D	3	0	1		0
E	0	0	0	0	

Flow Data (ii)

To / From	A	B	C	D	E
A		1	1	1	1
B	1		1	1	1
C	1	1		1	1
D	1	1	1		1
E	1	1	1	1	

Cost Data (iii)

FIGURE- 3.

Dept.	Area
1	12,000
2	8000
3	6000
4	12,000
5	8000
6	12,000
7	12,000

FIGURE- 4.