

B. E. PRODUCTION ENGINEERING THIRD YEAR FIRST SEMESTER EXAMINATION 2025

Subject: PLANT LAYOUT & PRODUCT HANDLING (HONS.)

Time: Three Hours

Full Marks: 100

Answer five questions taking at least two from each group

GROUP – A

- Q1. A) Explain the objectives of layout planning. Differentiate between flow and activity analysis.
B) Discuss the characteristics of a Cellular layout.
C) Explain with suitable example how the material handling cost of a machine tool manufacturing plant can be evaluated. 7+5+8
- Q2. The activity relationship chart, including the space requirements of a soft drink bottling plant is given in Fig. 1. Design a block layout for the plant using the SLP approach. Explain the all steps suitably. 20
- Q3. Activity relationships and departmental areas for a plant is given in Fig.2. Use the ALDEP heuristic to design the layout. Explain the all steps appropriately. 20
- Q4. Use the CRAFT heuristic to develop a layout for the given data shown in Fig.3. Explain the all steps correctly. 20

GROUP – B

- Q5. A) Draw neat sketch of a centrifugal discharge type Bucket elevator and explain: i) method of loading & unloading, ii) bucket type & bucket fixation.
B) Enlist & explain the desired properties of the material of the belt of a typical Belt Conveying system,
C) Evaluate the Conveying capacity of a typical Belt Conveying system carrying bulk material and explain how 'Angle of Repose' affects the conveying rate. 8+6+6
- Q6. A) Make a comparative analysis of the operating principle of i) pneumatic & hydraulic conveyor, & ii) oscillatory and vibratory conveyor.
B) State the applications of the following conveyors: i) Screw, ii) Roller, iii) Belt and iv) Chain conveyor.
C) State the characteristics of Bulk materials. 8+9+3
- Q7. A) What are the different types of AGVS used for product handling? With respect to an AGVS explain the following:
i) Vehicle Routing, & ii) Vehicle Guidance.
B) Draw neat sketch of a Walking Beam system and explain its' operation.
C) Explain the need for automated product handling. 10+7+3
- Q8. A) Which product handling equipment the following elements are associated with? State the functions of each one of them:
i) Nozzle, ii) Roller, iii) Take-up unit, iv) Slurry & v) Rigid Arm
B) With respect to the different product handling equipments, explain the following terms: i) pick-up velocity, ii) conveying rate, iii) loading efficiency, iv) inclination factor, v) specific water consumption. 10=10

[Turn over

B. E. PRODUCTION ENGINEERING THIRD YEAR FIRST SEMESTER EXAMINATION 2025

Subject: PLANT LAYOUT & PRODUCT HANDLING (HONS.)

Time: Three Hours

Full Marks: 100

Answer five questions taking at least two from each group

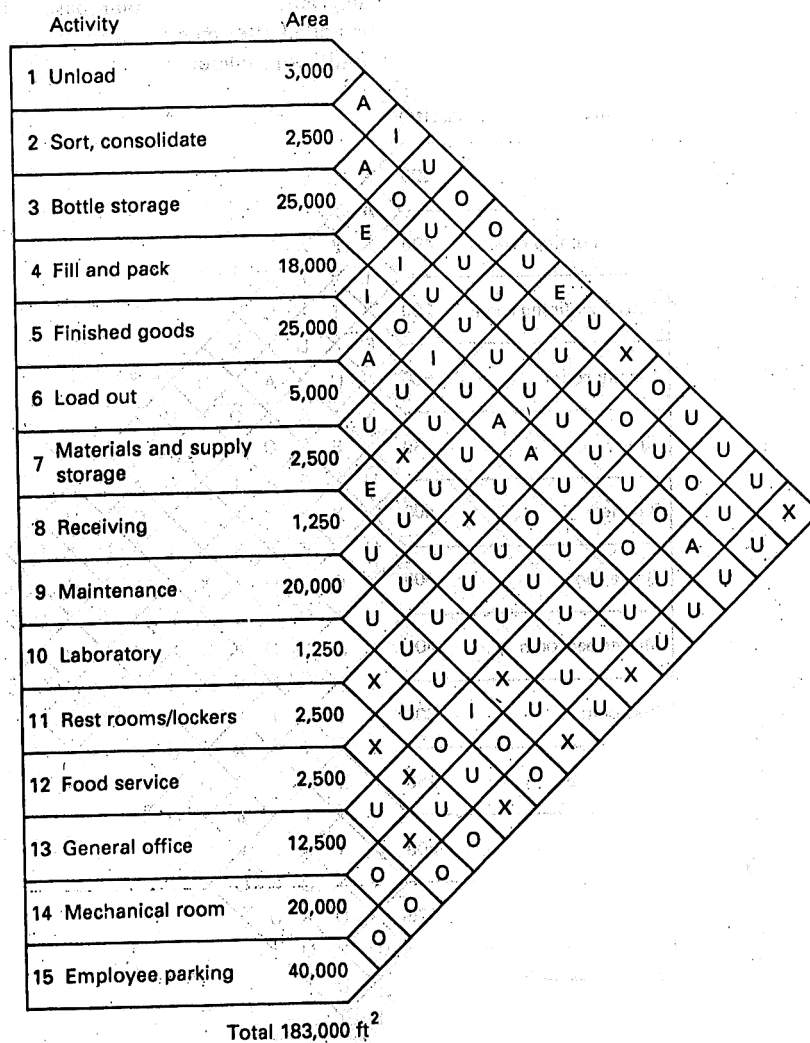


Fig: 1

B. E. PRODUCTION ENGINEERING THIRD YEAR FIRST SEMESTER EXAMINATION 2025

Subject: PLANT LAYOUT & PRODUCT HANDLING (HONS.)

Time: Three Hours

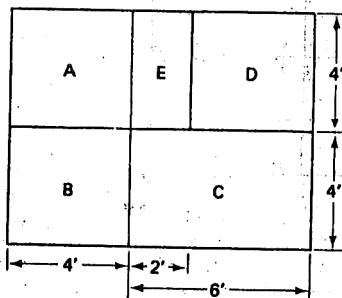
Full Marks: 100

Answer five questions taking at least two from each group

Dept. No.	Department	Area (ft ²)											
11	Lobby	600											
12	General manager's office	400	A										
13	Bookkeeping	350	E	E									
14	Supervisor's office	150	U	E	U								
15	Snack bar	350	O	U	O	O							
16	Maintenance	150	U	U	U	E	O						
17	Receiving and shipping	200	X	U	O	O	U	U					
18	Storage	800	U	U	O	O	U	O	A				
19	First aid	200	U	U	O	O	U	I	O	O			
20	Rest rooms	350	U	U	O	O	I	O	O	O	O		
21	Production	5,000	U	O	U	A	I	E	A	A	E	I	

Relationship Chart

Fig: 2



Initial Layout

To	A	B	C	D	E
From					
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

To	A	B	C	D	E
From					
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

Fig: 3