

B. PRODUCTION ENGINEERING THIRD YEAR, FIRST SEMESTER SUPPLEMENTARY EXAMINATION 2017

Subject: Plant Layout & Product Handling

Time : Three Hours

Full Marks: 100

Answer Any Five Questions

1(a)	Explain how Product design and Process design affect layout planning process.	(5)
(b)	Identify the design parameters of a Product Handling System and explain their respective effects.	(9)
(c)	Draw sketch of the cross-section of different type of screws used in Screw Conveyors and state their applications.	(6)
2.	Differentiate between i) Product Layout & Cellular Layout, ii) REL diagram & Space-Relationship diagram, iii) CRAFT & CORELAP iv) Activity analysis & Flow analysis	(20)
3(a)	Draw neat sketch of a Hydraulic conveying system & explain its operation. What is "Settling velocity"? Explain the significance of settling velocity with respect to a hydraulic conveying system.	(6)
(b)	Explain how conveying capacity and power requirement of a Hydraulic conveying system is evaluated.	(8)
(c)	Discuss the advantages and applications of a Pneumatic conveying system.	(6)
4(a)	Draw neat sketch of a gravity discharge type Bucket elevator and explain: i) method of loading & unloading, ii) bucket type & bucket fixation.	(10)
(b)	Enlist & explain the desired properties of the material of the belt of a typical Belt Conveying system,	(4)
(c)	Evaluate the Conveying capacity of a typical Belt Conveying system carrying bulk material and explain how 'Angle of Repose' affects the conveying rate.	(6)
5(a)	Briefly explain the followings: i) Man-Machine chart, ii) Fixed layout, iii) Part Family,	(12)
(b)	From the given data (Fig.1) evaluate the product handling cost corresponding to the initial layout.	(8)
6(a)	Explain the procedural steps of ALDEP,	(5)
(b)	From the given REL chart (Fig.2) evaluate the TCR of all the departments and identify the first, second and third department to move into the layout.	(7)
(c)	Explain the basis of selection of product handling equipments,	(4)
(d)	Discuss the advantages of automated handling of materials.	(4)
7	Write short note on (any three) : i) Unpowered Roller Conveyor, ii) Pneumatic Conveying System, iii) AGVS, iv) Automated transfer lines	(20)

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FIG.1

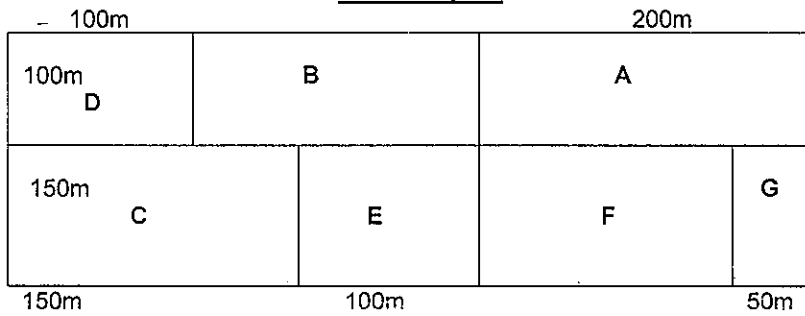
	A	B	C	D	E	F	G
A		12	7	8	11	--	3
B	9	--	2	3	7	9	--
C	1	2		4	4	7	4
D	--	3	1	--	--	8	5
E	3	2	--	--	--	5	2
F	3	--	3	--	1	--	5
G	--	2	--	3	--	7	--

Flow Matrix

	A	B	C	D	E	F	G
A		1	1	1	2		1
B	1		1	1	1	1	
C	1	1		2	1	1	1
D		1	2			1	1
E	1	2				1	1
F	1		1		1		2
G		1		1		2	

Cost Matrix

Initial Layout



DEPT. Area (m²) FIG.2

