Ref. No.: Ex/PROD/PC/H/T/315/2024

B. E. PRODUCTION ENGINEERING THIRD YEAR FIRST SEMESTER EXAMINATION 2024

Subject: PLANT LAYOUT & PRODUCT HANDLING (HONS.)

Time: Three Hours **Full Marks: 100**

Answer five questions taking at least two from each group

GROUP – A

1.a) What type of layout would you recommend for i) a LPG bottling plant, ii) a plant manufacturing small passenger cars, & iii) a coal fired thermal power plant ? And Why? Explain with proper reasons. 10

b)Elaborate the characteristics of the following type of layouts: i) Functional layout, ii) Line layout. 10

2. Briefly explain the followings highlighting their the applications in layout planning: i) Part Family, ii) Space Relationship diagram, iii)Man- Machine chart, iv) Relationship chart & v) From – To chart 20

3. a)State how space requirements are evaluated in Systematic Layout Planning (SLP). 5

b)From the given REL chart (Fig.1) make a layout using CORELAP heuristic. Explain all the steps and calculations. 15

4) Differentiate between: i) Activity analysis & Flow analysis, ii) Product Layout & Cellular Layout, iii) REL diagram & Space-Relationship diagram, iv) CRAFT & CORELAP 20

GROUP – B

5.a) Make a categorization of materials from product handling point of view and discuss their characteristics features. What is a material code? 7

b) Explain the basis of selection of product handling equipments for a given application. 6

c) Identify the main design parameters of a Product Handling System and explain their respective effects on system performance. 7

6. Which product handling equipment the following elements are associated with? State the functions of each one of them: i) Trough, ii) Nozzle, iii) Bucket, iv) Roller, v) Take-up unit, vi) Walking beam & vii) Swing tray 20

7. With respect to the different product handling equipments, explain the following terms: i) Settling velocity, ii) Conveying rate, iii) loading efficiency / filling factor, iv) specific water consumption, v) inclination factor & vi) Zone blocking. 20

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8. Discuss the principle of material conveyance, applications, and limitations and of the following (any three) : i) Hydraulic Conveying System, ii) Automated Transfer Line, iii) AGVS, iv) Belt Conveying System.

FIG.1 REL Chart