Exam Date & Time: 31-Dec-2022 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH MAKEUP SEMESTER EXAMINATIONS, DEC/JAN 2023

PROJECT ENGINEERING [CHE 4069]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Explain the significance of factors raw material and different modes of transportation for the selection of plant site. (5)

A)

B) Explain the meaning of 2"W6418E, R434A, 3^{11}FG8318E with piping and instrumentation diagram. (3)

C) Analyze the significance of Schedule number in pipe sizing. (2)

2) Distinguish between PERT and CPM. (3)

A)

B) Explain the terms prototype, spalling, pneumatic control device. (3)

C) Classify and explain the four stages involved in the formation of fire. (4)

3) Explain the various types of piping stresses that occurs in pipelines. (4)

A)

B) Categorize the different parts of plant air system. (3)

C) Explain any three forms of water which are used in the industries. (3)

4) Show with sketches the function of union, gate valve, coupling and globe valve (4)

A)

B) Starting from the principle of similarity, analyze the dynamic similarity used for comparing model and prototype in pilot plant study. (3)

C) Evaluate the expression for optimum production rate in terms of maximum profit per unit of time. (3)

5) The annual fixed cost for insulating a certain steam pipe insulation is given by

A) $$C_F = (50S + 30) + 100S$$

where S is the thickness of insulation in mm. (3)

The annual cost of energy lost or the direct cost or steam cost is $C_D = \frac{130}{S}$. Determine the optimum insulation thickness and the optimum annual insulation thickness cost (fixed cost, steam cost and total cost).

B) From the following data, draw a Gantt chart with horizontal scale denoting weeks. The duration for each activity is in weeks.

Activity 1 is 8 weeks; Activity 2 is 4 weeks; Activity 3 is 7 weeks;

Activity 4 is 9 weeks; Activity 5 is 3 weeks; Activity 6 is 3 weeks;

Activity 7 is 14 weeks; Activity 8 is 17 weeks (3)

Activities 1 and 2 can occur simultaneously. Activity 3 can take place after activity 2 is completed. Activities 4, 6 and 3 can occur simultaneously. Activity 8 can start 4 weeks after the commencement of activity 6. Activity 7 should follow activity 5. Activity 5 can begin simultaneously with activity 8. Estimate the project completion time.

C) With a neat sketch explain the working of electrolytic hygrometer. (4)

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