BCE Third Year Second Semester Examination, 2025

CONSTRUCTION MANAGEMENT

Time: 3 hours Full Marks: 100

Use separate answer-scripts for each part
Part I: (Carries 50 marks. Attempt all questions.)

1. A company has 3 plants that sells pack of bolts through 4 outlets distributed in different parts of the country. The production cost varies from factory to factory and the selling price varies from market to market. The shipping cost per unit of the product from each plant to each outlet is known and stable. The relevant data are given:

(a) Production Cost	Weekly production Capacity (Units)	Unit Production Costs (Rs)
Plant 1	400	19
Plant 2	500	24
Plant 3	800	20

(b) Shipping Cost (Rs/units)	To outlet 1	To outlet 2	To outlet 3	To outlet 4
From Plant 1	3	5	7	3
From Plant 2	7	4	6	7
From Plant 3	3	6	4	6

(c) Demand of outlets and selling price of each outlet are		
Outlets	Demand (Units)	Selling Price (Rs)
1	400	32
2	500	35
3	300	31
4	400	36

Chalk the **optimal plan to maximize profit** of the company using VAM and MODI, where net profit/pack = selling price/pack –production cost/pack –shipping cost/pack. 17 (CO3)

2. Solve the following LPP by Big-M method (not the geometrical approach):
Minimize $Z = 4x + 2y$, subject to $3x + y = 3$, $4x + 3y \geq 6$, and $x + 2y \leq 3$, where x and $y \geq 0$. 17 (CO3)

3. **(a)** Deduce the formulae for sinking fund deposit factor, uniform-series present-worth factor and capital recovery factor **with needed explanation.** 8 (CO4)

(b) Deduce the expression for Economic Ordering Quantity with shortage **explaining necessary terms.** 8 (CO4)

Ex/CE/HS/B/T/325/2025

B. E. CIVIL ENGINEERING THIRD YEAR SECOND SEM. EXAM. -2025

Sub: CONSTRUCTION MANAGEMENT **Time: Three Hours** **Full Marks 100**

PART-II (50 marks for this part)

Use a separate Answer-Script for each part

No. of questions	Answer all questions	Marks 15+12+8+15=50
1.	Write short note a. Parallel activity and serial activity b. Predecessor activity and successor activity c. dummy activity d. Slack and critical path. e. Fulkerson rule	CO1 3x5 =15
2.	A project consists of six activities designated from A to F, With the following relationships: 1) A is the first job to be performed. 2) B and C can be done concurrently, and must follow A. 3) B must precede D 4) E must succeed C, but it cannot start until B is complete. 5) The last operation F is dependent on the completion of both D and E. Draw the network diagram.	CO1 12

3.	A project is expected to take 15 months along the critical path, having a standard deviation of 3 months. What is the probability of completing the project within a) 18 months and b) 15 months and c) 12 months? Z(+) | Probability(%) | Z(-) | Probability(%) +0.9 | 81.59 | 0 | 50 +1.0 | 84.13 | -1 | 15.87 +1.1 | 86.43 | -1.1 | 13.57	CO1 8
4. a) b)	What are the difference between PERT and CPM ? What do you mean by Earliest Start Time (EST), Earliest Finish Time (EFT), Latest Start Time (LST) and Latest Finish Time (LFT)? Describe briefly.	CO2 5+10=15