BCE 4rth year 2nd Semester Examination, 2019
(2nd Semester)
CONSTRUCTION MANAGEMENT

Time: 3 hours

Full Marks: 100

Use a separate answer-script for each part
Part I
(Total 60 Marks; Attempt all questions)

1. What is an unbalanced transportation problem? Comment on what type of unbalance remains in the following problem. A construction company has three fabrication yards that require bolts. 3 suppliers have been invited to bid on supplying bolts. Their bids are as follows:

Supplier	Production cost, per pack	Annual capacity, in packs
A,	90	28000
B	100	76000
C	110	135000

The combined cost of transport and profit in rupees per pack varies from each supplier to each yard and is given as follows:

From Manufacturer	Sites number		
	1	2	3
A	20	40	10
B	50	30	60
C	30	20	70

The annual requirements of packs for 3 sites are 30000, 60000, and 122000, respectively. Use VAM and MODI to determine how many packs should each yard purchase from each manufacturer to **minimize** expenditure?   20

2. Use Big-M method to solve the following LPP:
   Minimize $Z = 5x + 3y$, subject to $2x + 4y \leq 12$, $2x + 2y = 10$ and $5x + 2y \geq 10$: $x, y \geq 0$
   20

3. (a) Storage tanks and pumps are to be provided for a growing demand. Two alternative proposals are to be considered.
   A. Construct Tank 1 with pump in year 1 at capital cost of Rs 400,000 and annual operating charges of Rs 30,000. Then on the 12th year construct Tank 2 with pump at additional cost of Rs 500,000 and operating cost of Rs 55,000 per annum.
   B. Construct Tank 3 in year 1 at capital cost of Rs 650,000 and running cost of Rs 30,000 per annum. Then on 12th year add extra pump at additional capital cost of Rs 50,000 and increased running cost of Rs 55,000 p.a. Use a discount rate of 8% p.a. Compare the proposals in the basis of **net present value.**   10

   (b) Formulate the EOQ model **with shortage.**   10

B. E. CIVIL ENGINEERING FOURTH YEAR SECOND SEM. EXAM. -2019

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

PART-II

(40 marks for this part)

Use a separate Answer-Script for each part

No. of questions	Answer all questions	Marks (20x2)=40
1. a)	Define optimistic time, pessimistic time, most probable time and expected time of completion of project and write down their relationship.	10+10=20

b)	Draw a network of a project having seven activities. Activity A, B, C runs concurrently. Activity predecessor relationships are as follows
	
	Activity Immediate predecessor
	  D A
	  E B
	  F C
	
	Activity G is the last operation of the project and immediate successor of D, E and F.	

2.

The network diagram of a project is given below. The Durations (t^{ij}) of each activity are given in following table. Calculate only Earliest Event time (T_E), Latest Event occurrence time (T_L), Earliest start time (EST), Earliest finish time (EFT), Latest start time (LST), Latest finish time (LFT) and total float (F_T) for each activity. Assume T_E and T_L of last event (event 8) is same. Also assume T_E and T_L of start event (event 1) is Zero.

20

Activity (i-j)	Duration (t^{ij})
1-2	10
1-3	12
2-5	8
2-7	12
3-4	6
3-6	5
4-5	8
5-6	8
5-7	10
6-7	6
7-8	12