

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -2 EXAMINATION- OCTOBER 2022  
B.Tech 5<sup>th</sup> Semester (CIVIL)

COURSE CODE: 18B1WCE531 (3)

MAX. MARKS: 25

COURSE NAME: Construction Technology and Management

COURSE INSTRUCTORS: Mr. KAUSHAL KUMAR

MAX. TIME: 1.5 Hrs

*Note: All questions are compulsory. Carrying of mobile phone or sharing of materials during examinations will be treated as case of unfair means.*

Q 1. A project consist of seven activities P, Q, R, S, X, Y and Z. Their sequence and duration is shown in following table: CO-1, CO-2, CO-3 [ 1+2+ 2 = 5 Marks]

Activity	Duration in weeks			Immediate Predecessor
	Pessimistic	Optimistic	Most likely	
P	18	9	12	-
Q	17	6	10	P
R	8	4	6	P
S	26	14	17	Q, R
X	21	10	14	Q
Y	14	8	11	S, X
Z	10	6	8	S

- i. Draw the network Diagram.
- ii. Show the critical path and determine the expected completion time.
- iii. What is the probability of the project being completed in 58 days? Probability may be linearly interpolated from the table of probability factors (Z).

Z	1.0	1.5	2.0	2.5	3.0
Probability	84.13	93.32	97.72	99.38	99.87

Q 2. Draw the network for the following project and indicate the event times and Critical Path. Also find the Project duration and Total Float for all activities:

Activity	Duration (Days)	Preceding Activities
A	5	-
B	3	A
C	3	A, B, F
D	7	C, L
E	7	D, G, H
F	2	A
G	2	F
H	3	G, L
K	6	A
L	3	F, K

CO-1, CO-2, CO-3 [ 2+2+ 2 = 6 Marks]

**Q 3.** A small CPM network has the following data given in the table below. Establish the optimum schedule for (i) minimum cost, and (ii) minimum duration. Indirect cost is *Rs 3000* per day and normal total cost is *Rs 2,00,000* only. Above results must be clearly shown in Graph paper along with total cost curve on it. **CO-2, CO-3, CO-4 [ 2+2+2 = 6 Marks]**

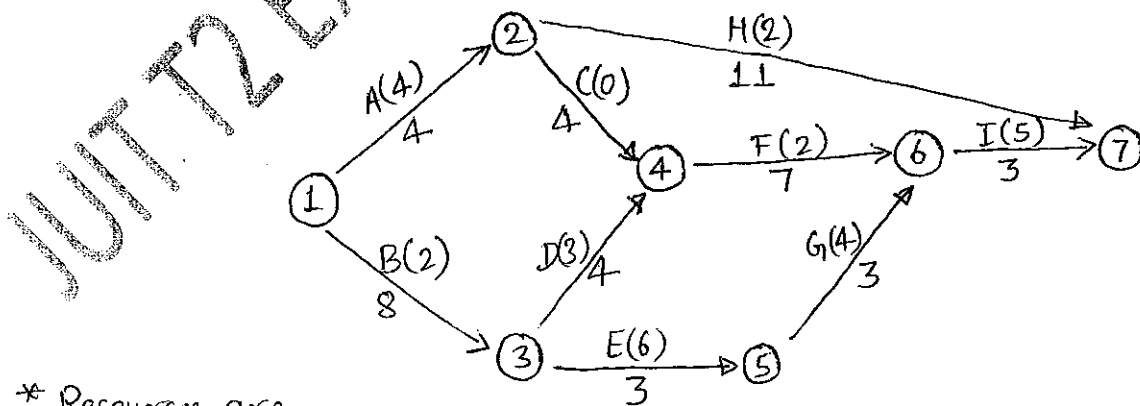
Activity	Following	Preceding	Duration, days		Time cost curve slope in Rs/day
			Normal	Minimum	
A	D & E	-	8	6	2000
B	F	-	12	8	1500
C	-	-	20	19	2500
D	-	A	10	9	3000
E	F	A	5	3	1000
F	-	B & E	10	9	2200

**Q4.** A network is shown which is to be updated at the end of 12 weeks. The following exists at the time of updating:-

- Act. 0-1, 0-2, 1-2 are completed
- Act. 2-3 has been progressing for 3 weeks and need 8 more weeks for completion.
- Act. 2-4 has been in progress for 3 weeks, since a new machine has been commissioned, the present estimate is that it can be completed in 6 more weeks.
- A reassessment of activity 5-6 has revealed that it can be completed in 7 weeks.

**CO-3, CO-4 [ 3 Marks]**

**Q5.** Consider the network diagram shown below. Level out the requirement of the resources, if the maximum number of labour on any day, has to be limited to 7. Draw the allocation of resources before and after Leveling operation on *Graph Paper*.



\* Resources are shown in bracket

**CO-3, CO-4 [ 5 Marks]**

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