

**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI**  
**First Semester (2023-24)**  
**MIDSEMESTER TEST**

**Course No. CE G527**  
**Duration: 90 Minutes**

**Course Title: Construction Management**  
**Maximum Marks: 60**

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**Q.1 a) Fill in the blanks**

**[1x5=5]**

- i. Slack time refers to\_\_\_\_\_
- ii. The time by which the completion of an activity can be delayed without affecting the start of succeeding activities is called\_\_\_\_\_
- iii. Interfering float is the difference between\_\_\_\_\_
- iv. In CPM and PERT methods activities are connected with each other in \_\_\_\_\_.
- v. The time corresponding to minimum total project cost is\_\_\_\_\_

**b) Answer briefly**

**[2x5=10]**

- i. What is the significance of the Cost Slope briefly explain?
- ii. What is the significance of total project cost and optimum duration, briefly explain their relations.?
- iii. What is the basic difference between building construction and infrastructure construction?
- iv. List the different stages of construction.
- v. List the different types of projects.

**Q.2** The following activities typically represent the construction of one-story Reinforced Cement Concrete (RCC) building. Draw the CPM network and calculate EST, LST, EFT, LFT for the following data and determine the total float. **[10]**

Name of the activity	Activity	Duration (in days)	Manpower/day
Earthwork excavation	1-2	5	3
Preparation of Foundation concrete	1-3	3	2
Foundation concrete and curing	2-4	10	4
Raising of superstructure (roof)	3-4	15	5
Sand filling	3-5	7	3
Preparation of reinforcement	4-6	3	1
Construction of reinforced masonry	5-6	25	6
Finishing and painting	6-7	15	2

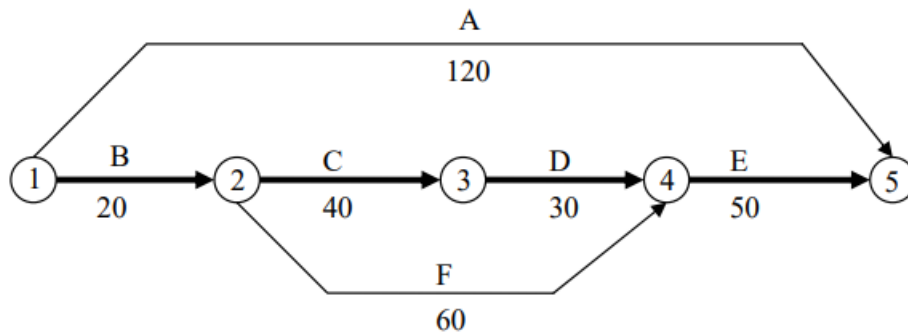
Q.3. For the following activities determine:

[15]

- Critical Path Using PERT
- Calculate the variance and standard deviation for each activity
- Calculate the probability of completing the project in 26 days.

Activity	$t_o$	$t_m$	$t_p$
1-2	6	9	12
1-3	3	4	11
2-4	2	5	14
3-4	4	6	8
3-5	1	1.5	5
2-6	5	6	7
4-6	7	8	15
5-6	1	2	3

Q.4 The network and durations given below shows the normal schedule for a project. You can decrease (crash) the durations at an additional expense. The Table given below summarizes the time-cost information for the activities. The owner wants you to finish the project in 110 days. Find the minimum possible cost for the project if you want to finish it on 110 days. (Assume that for each activity there is a single linear, continuous function between the crash duration and normal duration points). [20]



Activity	Normal duration (days)	Crash Duration (days)	Normal Cost	Crash Cost
A	120	100	12000	14000
B	20	15	1800	2800
C	40	30	16000	22000
D	30	20	1400	2000
E	50	40	3600	4800
F	60	45	13500	18000