N.B. : (1) Question No. 1 is **compulsory**.
(2) Attempt any **four** questions out of remaining **six** questions.
(3) Assume **suitable** data if **necessary** stating them **clearly**.
(4) Draw **suitable** sketches where **necessary**.

Q. 1] a) What is project? Explain Project planning in context with functions, task management, project life cycle elements. (10)

b) Describe various scheduling techniques. (10)

Q. 2] a) Write detailed note on escalation. (10)

b) A project has the following cash flow stream:

Sr.No.	Year	Cash Flow (Rs.)
1	0	1,000,000/-
2	1	200,000/-
3	2	200,000/-
4	3	300,000/-
5	4	300,000/-
6	5	350,000/-

The cost of capital 'r' is 10 percent. Calculate the net present value. (10)

Q. 3] a) Explain the concept of Work Breakdown Structure (WBS) and prepare a WBS for a project consisting of building an proposed engineering college building housing Civil, Electrical and Mechanical departments. (10)

b) Prepare Bar chart for the project work mentioned in Q.[4]. (10)

Q. 4] Table below shows the details of a small construction project. For the above Project indirect cost is Rs. 3000/- per week. Incentive of Rs. 3000/- per week for completion of work before normal duration upto a maximum of four weeks. Estimate the normal duration of activities from the time estimates.

Activity	Predecessor	Time Estimates (Weeks)			Normal Cost (Rs. Th.)	Crashed Duration (Weeks)	Crashed Cost (Rs. Th.)	Crew Size (Nos)
		t_o	t_m	t_p				
M	H,L	4	8	12	11	5	17	4
L	C	4	7	10	6	5	9	2
K	G	10	12	14	7	10	13	1
H	F	12	15	18	13	12	17	6
G	E,A	6	10	14	10	7	12	2
F	E,A	3	6	9	7	5	13	6
E	D,B	6	10	14	4	7	14	2
D	C	6	7	8	1	6	6	3
C	-	2	4	6	3	2	5	0
B	-	2	3	4	9	2	10	6
A	-	4	6	8	6	5	9	7

(i) Prepare cash flow diagram.
(ii) Prepare Time Scaled Network for Optimal duration.
(iii) Carry out step by step crashing to obtain optimum time-cost network. (20)

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Q. 5] a) With reference to data given in Q. [4] Determine (i) the probability of completion of the work in all crashed duration. (ii) the probability of completion of work 2 weeks early and 2 weeks later than the optimum duration. (06)

b) Following table shows details of a small project. Carry out resources leveling as per EST, LST and Leveled criteria. Also determine, (i) man-days required for the work. (ii) all the floats. (14)

Activity	Node		Duration (Days)	Mason (Nos)
	Start	End		
A	10	20	10	2
B	10	30	7	5
C	10	40	5	3
D	20	60	3	0
E	30	50	4	5
F	40	50	6	3
G	50	60	7	5
J	50	80	10	2
K	50	90	12	2
H	60	70	6	5
R	60	80	5	5
N	70	100	10	2
S	70	110	7	5
L	80	90	9	5
M	80	100	6	3
Q	90	100	15	5
P	100	110	5	5

Q. 6] a) Describe in detail the safety measures that should be implemented to carry out civil works for a high rise building. (10)

b) Discuss the use and limitations of quality control charts. (10)

Q. 7] a) Describe the overall change in scenario of construction industry in the Metro cities since last five years. (10)

b) Describe following (i) Matrix Organization, (ii) Fulkerson's Rule, (iii) use of computers in managing construction projects. (10)

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