

Time: 3 Hours

Marks :80

Note:

- i) Q. 1 is compulsory.
- ii) Attempt any three out of remaining five questions.
- iii) Figures to right indicates full marks.
- iv) Assume Suitable data if required and specify it clearly, correctly and in upper case letters.

- Q1. a) Describe in detail Henry Fayol's management principles (any ten). -10M
 b) What are the unique features of Construction Industry in India? -05M
 c) Write Short note on 'Life Cycle of Construction Project' -05M

- Q2)a) Draw Activity on Arrow diagram to show following relationship: -10M

Sr No	Activity	Preceding Activity	Duration in days
1	P	-	4
2	Q	-	6
3	R	P	8
4	S	Q	4
5	T	Q	7
6	U	R,S	6
7	V	R,S	4
8	W	T,U	6

Show Critical Path on network and specify critical activities and find Project duration. Find the Activity Times and calculate all types of Floats.

- b) What is the difference between CPM and PERT network? -05M
 c) Write a short note on Post-work order and preconstruction planning by contractor. -05M

Q3) A PERT network comprises of 10 activities. They together with their 3 time estimate are shown in the following table:-

Activity	i-j	to (days)	tm(days)	tp(days)
A	10-20	4	6	8
B	20-40	3	6	9
C	20-30	1	2	3
dummy1	30-40	-	-	-
D	40-50	2	4	6
E	30-50	3	6	9
F	50-60	1	2	3
G	50-70	2	4	6
dummy2	60-70	-	-	-
H	70-80	4	6	8

- i) Draw PERT network and find variance of each activity -3M
 ii) Compute the expected completion time of the project corresponding to 50% probability -3M
 iii) What is the probability of the work being completed in 29 weeks? -2M
 iv) What will be the project duration corresponding to 90% probability? -2M

Z - factor	Probability	Z - factor	Probability
+3.00	99.87	-1.00	15.87
+2.00	97.72	-2.00	2.28
+1.00	84.13	-3.00	0.13
0.00	50.00		

- b) Explain WBS with an example. -5M
 c) Write note on Bar chart and milestone chart and highlight their difference. -5M

Q.4 a) What is the distinction between resource smoothing and resource levelling? -8M
 Explain with example resource conflict on a construction project.

- b) Prepare Resource histogram with respect to EST and LST -12M
 Comment which solution is better and why.

Activity	Preceding Activity	Duration	Resources(men)
A	-	2	4
B	A	2	3
C	A	3	4
D	B	3	4
E	C	1	2
F	D,E	2	3
G	D,E	3	2
H	F	2	3

Q5) a) What do you understand by compression and decompression of a network? -10M
 When in a Construction project a project manager has to compress and decompress a network?

- b) The Cost duration data for a construction job is as given below:-

Activity	Preceding Activity	i-j	Normal duration (weeks)	Crash duration (weeks)	Normal Cost (Thousand)	Crash Cost (Thousand)
L	-	10-20	4	2	8	12
M	-	10-30	5	4	10	15
N	L	20-40	3	2	6	8
P	M	30-50	4	2	4	6
Q	N	40-50	6	4	3	4
R	P,Q	50-60	4	2	3	5

The Indirect Cost of the project is Rs.2000/- week

- Find i) Critical Path, Normal Project duration and Critical Activities. -3 M
 ii) Minimum duration and corresponding cost. -2 M
 iii) Optimum Time Cost Combination and -4 M
 iv) plot time cost curve. -1 M

Q.6) Write notes on followings (Any five) -20M

- Workmen's Compensation Act 1923.
- Statistical Quality Control
- Quality Manual and Checklists
- Updating of Project network
- OSHA
- ABC Analysis
- Costs of accident

Time: 3 Hrs

Total Marks: 80

1. Question No.1 is compulsory
2. Attempt any three questions out of remaining questions

Q1. Attempt any Four

(4x5)

- a. Write a detailed note on "General OSHA Requirements
- b. What do you mean by work place violence? How it can be prevented?
- c. Write a short note on vehicle safety on site
- d. Write a short note on "Pre-Planning and Safe Work Practices".
- e. What is safety campaign? State the importance of safety campaign.

Q2.

(2x10)

- a. What are different types of work place violence? Discuss preventive steps.
- b. Write a detailed note on safety precautions in using scaffolding and platforms

Q3.

(2x10)

- a. State various causes of falls. Explain General Strategies for Preventing Slips under OSHA guidelines.
- b. What is workers compensation insurance? Explain in detail with considering various key points.

Q4.

(2x10)

- a. Explain each and every one in detail "Safety Measures and accident Prevention in Bridges"
- b. State types of safety audits. Explain each of them in detail.

Q5.

(2x10)

- a. What precautions are to be taken while excavation at a site for foundations?
- b. Write a short note on "safety in building construction".

Q6.

(2x10)

- a. Explain in details safety tips while using crewel crane and tower crane.
- b. Write note on safety policies to be adopted on a construction site, methods and equipment.

Time: 3-hour

Max. Marks: 80

- N.B.:** (1) Question No. 1 is Compulsory.
 (2) Attempt any three questions out of the remaining five.
 (3) All questions carry equal marks.
 (4) Assume suitable data, if required, and state it clearly.
 (5) Notations carry the usual meaning.

Q1. Answer the following (Any FOUR).

[20M]

- Explain the triple constraint in Project Management.
- Explain the Stages of team development & growth.
- Explain the work breakdown structure (WBS).
- Explain Goldratt's critical chain.
- Explain the earned value management technique for measuring the value of work.
- Explain multicultural and virtual projects.

Q2. (a) ABC Industries has a potential project with an initial cost of Rs. 20,00,000. The capital budget allows to accept only one project. Using the NPV method, which project should be selected? [10M]

Cash Flows (Year)	Project A	Project B	Project C	Project D
1.	6,00,000	5,00,000	10,00,000	3,00,000
2.	6,00,000	5,00,000	8,00,000	5,00,000
3.	6,00,000	5,00,000	6,00,000	7,00,000
4.	6,00,000	5,00,000	4,00,000	9,00,000
5.	6,00,000	5,00,000	2,00,000	11,00,000
Discount Rate	9%	6%	15%	22%

Q2. (b) Discuss why project management is essential in today's business environment. What benefits does it provide in achieving organizational goals? [10M]

Q3. (a) Explain Risk response strategies for positive and negative risks. [10M]

Q3. (b) What is the importance of vendor documents? How the vendor documents should be preserved? [10M]

Q4. (a) The R & D project has a list of tasks to be performed whose time estimates are given in the table below. [10M]

Activity	Predecessor Activity	t_o	t_m	t_p
A	-	2	4	6
B	A	3	6	9
C	A	8	10	12
D	B	9	12	15
E	C	8	9	10
F	D, E	16	21	26
G	D, E	19	22	25
H	F	2	5	8
I	G	1	3	5

1. Draw the project network.
2. Find the critical path.
3. Find the time required to complete the following project and the critical activities.

Q4. (b) Explain the aggregate project plan used in the portfolio process. [05M]

Q4. (c) Explain the project buffer. [05M]

Q5. (a) Explain the project management template with a sample template sheet. [10M]

Q5. (b) Define Project Management Information Systems (PMIS) and evaluate its role in the successful execution of complex projects [05M]

Q5. (c) Write a short note on the GANTT chart. [05M]

Q6. (a) Why meetings are useful in project monitoring? What rules should be followed to maximize the effectiveness of meetings? [10M]

Q6. (b) List and briefly describe the ways projects may be terminated. What are some non-technical reasons for project termination? [10M]

Duration: 3 Hours

[Total Marks: 80]

Instructions:

1. Question No.1 is **compulsory**.
2. Answer any **three** from the remaining.
3. **Each** full question carries **20 marks**.

- Q. 1) Answer any four** **20 Marks**
- a) Write a note on importance of maintenance of structures.
 - b) Write a note on the use of ferrocement for the repair works.
 - c) Enlist various crack measurement techniques. Explain any one.
 - d) Write a note on repair & rehabilitation of heritage structures.
 - e) What are the various physical causes of deterioration of concrete?
- Q. 2)**
- a) Write a note on the damages caused to the structures due to earthquake. How restoration & retrofitting of such structures is carried out? **10 marks**
 - b) Explain gravity filling method and drilling & plugging method of crack repair techniques with the help of detailed sketches. **10 Marks**
- Q. 3)**
- a) With the help of neat sketches, explain pull-out test & probe test on concrete. **10 marks**
 - b) Explain Ultrasonic Pulse Velocity method of NDT, in detail, with neat sketches. **10 Marks**
- Q. 4)**
- a) Enlist the types of corrosion of structural steel. Discuss any one in detail. **10 Marks**
 - b) How shoring technique is used for the rehabilitation of foundations of the structures? Discuss in detail, with the neat sketches. **10 Marks**
- Q. 5)**
- a) Discuss about plate bonding technique & fibre wrap technique used for repairing the RCC elements. **10 marks**
 - b) Write a detailed note on cathodic protection method used for corrosion repair. **10 marks**
- Q. 6)**
- a) Discuss about epoxy injection method of crack repair technique. **05 Marks**
 - b) Write a note on plastic shrinkage cracks & thermal cracks in concrete structures. **05 Marks**
 - c) Discuss about shotcreting technique of repair. **05 Marks**
 - d) Discuss about the application of chemical rust remover for cleaning the corroded reinforcement. **05 Marks**
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