

[Time: 3 Hours]

[Marks:80]

1. Questions No. 1 is Compulsory.
2. Attempt any three out of remaining Questions.
3. Figures to the right Indicate full marks.

Q.1 Attempt any Four.

20

- a) Explain any five Salient features of the Environment Protection Act, 1986.
- b) Describe the current energy scenario in India. What challenges does India face in meeting its energy demands?
- c) What is a food chain? How does it differ from a food web?
- d) What are atomic and biomedical hazards?.
- f) Explain the role of the government as a planning and regulatory agency.

Q.2 a) Discuss major environmental problems in India and their implications for public health and natural resources.

10

- b) Explain Ozone layer depletion? What are the Causes, effects and preventive measures of Ozone depletion?

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Q.3 a) Define ecosystem. Classify different types of Ecosystems? What are the biotic and abiotic components of an ecosystem?

10

- b) Discuss the role of Central Pollution Control Board (CPCB) in pollution monitoring.

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Q.4 a) What is ISO 14000? Explain its significance in environmental management and how it helps organizations reduce their environmental impact.

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- b) What is Corporate Environmental Responsibility (CER)? Explain its importance and mention any three ways in which companies can practice CER to promote environmental sustainability.

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Q.5 a) Compare natural and human-made sources of greenhouse gases. Which ones have the greatest impact on global warming and why? Support your answer with examples

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- b) What is Environmental Quality Management (EQM)? Explain its objectives in detail.

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Q.6 a) With reference to EMS, explain PDCA cycle with neat diagram.

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- b) Critically evaluate the concept of sustainable development as a multidimensional approach. How does it reconcile the conflicting goals of economic growth, environmental conservation, and social equity?

10

Time: 3-hour

Max. Marks: 80

Note:

Question 1 is Compulsory**Attempt any three of remaining five questions****Figure to Right indicates full Marks****Assume the suitable data and clearly state the same**

- Q1a. Explain 14 principles given by Mr. Henry Fayol for successfully running the organization 10M
- Q1b. Determine the critical path and Project Duration, Activity times and all the types of floats. 10M

Activity	Succeeding Act	Duration
A	C, D	2
B	F, G	3
C	F, G	7
D	E	2
E	K	2
F	K	5
G	H, I	3
H	K	1
I	-	4
K	-	6

- Q.2a. Following is the data of associated with research and development project (All Durations in Months)

Activity	A	B	C	D	E	F	G
Preceding Activity	-	-	A	B	A	B	C, D
to	6	5	4	4	4	2	4
tm	9	8	7	7	7	5	10
tp	12	17	22	16	10	8	22

- i) Determine the Duration, standard deviation, and variance of project.
- ii) What is the probability of completing the project in 29 months?
- iii) What is the schedule duration with 90% probability?
- iv) What is the schedule duration with 98% probability

Z	-3	-2	-1	0	1	2	3
P%	0.13	2.28	15.87	50	84.13	97.72	99.87

- Q.2.b. i) Work Breakdown Structure
- ii) Differentiate CPM and PERT

Q3a.	What is Resource Smoothing and Leveling. Explain the process of Resource smoothing.								8M	
Q.3b.	Prepare EST and LST schedule. Prepare resource histogram Which schedule you will prefer and why?								12M	
	Activity	A	B	C	D	E	F	G		H
	Preceding Activity	-	A	-	-	-	C	B, E		F, G
	Time	2	2	2	4	2	3	3		4
	Mason/Day	6	7	3	9	4	8	2		1
Q.4.a	Determine the optimum cost and optimum duration of project. Data for each activity is given. Indirect cost = 4,000 Rs/ Day.								12M	
	Activity	Normal Time	Crash Time	Normal Cost (In Lakhs)		Crash Cost (In Lakhs)				
	U (1-2)	12	8	0.9		1.1				
	V (2-3)	28	18	0.75		1.1				
	W (3-5)	24	14	0.9		1.2				
	X (1-4)	18	12	1.2		1.5				
	Y (4-5)	24	23	0.4		1				
	Z (5-6)	12	12	1		1				
Q.4.b	What do you mean by time and cost over run? Discuss the causes of time over run and cost over run. What are the control measures to avoid time and cost over run.								8M	
Q.5a.	What is need of updating the schedule? Discuss the procedure of updating the schedule.								8M	
Q.5b.	What are the causes of accidents? Suggest the corrective measures to avoid accidents on construction site								8M	
Q.5c.	What is the role of inspection in Quality control								4M	
Q6	Solve any 4 (5 Marks each)								20M	
i)	Principles of scientific management									
ii)	Roles of various agencies involved in construction project									
iii)	ABC Analysis									
iv)	Role of safety in construction									
v)	OSHA									
vi)	Workmen compensation act									

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 short note on “Safety policies ”
- b. What are the responsibilities of safety committee and safety officer?
- c. Write a short note on “Specialized Bridge Access Equipment”
- d. What is the need of CPR as an emergency response at a construction site? Explain procedure.
- e. Write note on “safety in office”.

Q2.

(2x10)

- a. Write a detailed note on “Safety Measures and accident Prevention in Roads Construction”
- b. State and explain Safety while using electrical appliances

Q3.

(2x10)

- a. What are the objectives of “Safety in Construction Industry”. Explain all objectives in detail.
- b. What training is to be provided to the staff on a construction site of high rise structures for safety?

Q4.

(2x10)

- a. What is zero accident period? How it can be achieved? What are its advantages?
- b. What are different special precautions involved in construction site of tunnel.

Q5.

(2x10)

- a. Write a short note on accident analysis. How direct and indirect costs are involved in it.
- b. How India does promote occupational safety and health? Explain in the light of existing national safety policies.

Q6.

(2x10)

- a. Explain each and every step in detail “Safety Measures and accident Prevention in Dam Construction”.
- b. Write a short note on “Pre-Planning and Safe Work Practices.

Time: 3 hours

Max. Marks: 80

Please Note:

1. All questions carry equal marks
2. Question one is compulsory. Attempt any three out of remaining questions.
3. Figure to the right indicates full marks.

Q1	Attempt any four	20
	a) Describe the key steps of a benefit-cost analysis in project management.	
	b) Elaborate the importance of Road infrastructure in india.	
	c) Explain the types of subsidies in the power sector.	
	d) Write a short note on EIA Report Preparation.	
	e) Write a short note on PPP Public Private Partnership.	
	f) Write a short note on Environmental Impact Assessment.	
Q2	a) What challenges do governments face in maintaining effective project governance in public sector projects?	10
	b) How do the financing models for infrastructure projects in the transportation, power and telecom sectors?	10
Q3	a) How do infrastructure projects identify, assess and mitigate risks throughout their lifecycle?	10
	b) Explain in detail Life cycle and Benefit cost analysis.	10
Q4	a) Discuss different innovative funding options available for urban infrastructure projects in India.	10
	b) How does Environmental Impact Assessment evaluate and address the potential impacts of infrastructure projects on air quality, water Resources, soil health and noise pollution?	10
Q5	a) What are the major challenges in financing large-scale urban infrastructure projects?	10
	b) Discuss the role of fair process and negotiations in successful project delivery.	10
Q6	a) Explain case Studies in details from the Following 1)Mass Transit System 2)Government funded projects	10
	b) Explain risk management in infrastructure projects.	10

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.

Q. 1 Answer any **FOUR**. **20**

- a. Explain the necessity of project management in achieving organizational goals.
- b. What is Goldratt's critical chain method?
- c. What are the numeric and non-numeric models of project selection?
- d. What is concurrent engineering?
- e. Explain various Reasons for project termination.
- f. Define scope creep. What are two ways to control it in a project?

Q.2 a. Describe the typical and atypical project life cycles, highlighting the stages in the stage-gate process. **10**

- b. Assume that ABC Inc. is considering two projects, namely Project X and Project Y, and wants to calculate the NPV for each project. Both project X and project Y are four-year projects, and the cash flows of both projects for four years are given below: **10**

Year	Project A Cash Flows in Rs.	Project B Cash Flows in Rs.
1	5000	1000
2	4000	3000
3	3000	4000
4	1000	6750

The firm's cost of capital is 10% for each project, and the initial investment amount is Rs.10,000. Calculate the NPV of each project and determine in which project the firm should invest.

Q.3 a. What are the advantages and risks of outsourcing in project management? **05**

- b. List the key components of a project communication plan. **05**
- c. Describe the methods of project cost estimation and differentiate between top-down and bottom-up budgeting approaches. **10**

Q.4 a. What are the different types of contracts? Draw the graph showing risk exposure to the buyer and seller in various contract types. **10**

10

b. A small project consisting of ten activities has the following characteristics:

Activity	Preceding Activity	Time Estimate weeks		
		Optimistic	Most likely	Pessimistic
A	—	4	5	12
B	—	1	1.5	5
C	A	2	3	4
D	A	3	4	11
E	A	2	3	4
F	C	1.5	2	2.5
G	D	1.5	3	4.5
H	B,E	2.5	3.5	7.5
I	H	1.5	2	2.5
J	F,G,I	1	2	3

Determine the critical path.

- Q.5** a. Explain the Probability and impact matrix. What are the risk response strategies for negative risks(threats) and positive risks(opportunities). **10**
- b. Explain the four stages of team development and growth. **10**
- Q.6** a. Discuss the various reasons for project termination and explain different types of project termination. **10**
- b. Explain the importance of ethics in projects. **05**
- c. Explain the Triple constraint of project management in brief. **05**

Duration: 3hrs

Marks:80

- Instructions.: (1) Question No 1 is **Compulsory**.
(2) Attempt any **three** questions out of the remaining five.
(3) **Each** full question carries **20** marks.

- Q.1 Answer any FOUR:
- a What are the different stages involved in condition survey of a building? (05 M)
 - b Discuss the different physical causes of deterioration of concrete structures. (05 M)
 - c What is the cause of lamellar tearing in steel structures? How it can be prevented? (05 M)
 - d How does Rebound hammer test help in assessing the quality of concrete? (05 M)
 - e Explain base isolation. (05 M)
- Q.2
- a Discuss the different semi-destructive tests conducted for strength assessment of concrete. (10 M)
 - b Explain the following methods of crack repair with neat sketches. (05 M)
 - (i) Routing and sealing
 - (ii) Stitching
 - c List out the applications of ferrocement as a repair material? (05 M)
- Q.3
- a Explain the dry mix and wet mix processes of shotcreting. (10 M)
 - b Briefly explain plastic shrinkage cracks. What are the measures taken to reduce plastic shrinkage cracks? (05 M)
 - c Write a note on cathodic protection. (05 M)
- Q.4
- a Briefly explain fibre wrapping and plate bonding techniques of retrofitting. (10 M)
 - b List out the various tests conducted for corrosion potential assessment. Briefly explain Half Cell Potential survey. (05 M)
 - c Explain injection grouting? (05 M)
- Q.5
- a Explain the physical and mechanical properties of Polymer Modified Mortar/Concrete. Enlist the applications of PMM/PMC. (10 M)
 - b What are the causes of deterioration of steel structures? Suggest some remedial measures. (05 M)
 - c Explain underpinning as a foundation rehabilitation technique. (05 M)
- Q.6 Briefly explain the following:
- a Passivators for reinforcement protection (05 M)
 - b Shoring and its types (05 M)
 - c Autogenous healing of concrete (05 M)
 - d Repair of heritage structures (05 M)
