

Exam.	Regular		
Level	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Construction Management (CE754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt **All** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

1. a) Discuss on scope of construction management. Explain about the relationship between client, consultant and contractor to perform the project effectively. [2+3]
- b) The details of a project are shown below. If the indirect cost per week is Rs.400, find the lowest cost schedule of the project. [7]

Activity	Predecessor (s)	Time (weeks)		Cost (Rs)	
		Normal	Crash	Normal	Crash
A	-	8	5	2000	2200
B	-	10	8	3800	4000
C	B	6	5	2700	2600
D	A	9	6	4100	4300
E	C	10	9	3100	3350
F	B	12	12	3100	3100

2. a) What are the prominent advantages and disadvantages of using construction equipments? Explain in short. [3]
- b) Explain the equipments with the help of neat sketches: Concrete mixer and Backhoe. [3]
3. a) Write down the activities to be carried out before inviting tender. Explain about the different types of contract practicable in our context. [3+3]
- b) List down the various components for site preparation. Explain about the cash flow management in construction project. [3+3]
4. a) Discuss about the importance of safety requirements in the construction site. How building codes of any country helps in effective urban planning? [2+3]
- b) Why specification is important in construction contracts? Write down the major techniques that you follow for writing specification. [2+3]
5. a) Why it is necessary to do the material productivity control in the construction project? Define equipment productivity control. [3+3]
- b) What is muster roll and why it is important? Explain about the site order book. [3+3]
6. a) Name the types of Contract. Explain the item rate contract. [6]
- b) Calculate the value of a building built 20 years ago having plinth area 500 sqm, constructed in the land of 1000 sqm. Current market value of the land is Rs. 25000 per sqm and rate of building is Rs. 50,000 per sqm. Assume suitable data if necessary. [6]
7. a) Discuss the Use of Earned value analysis for Performance control in a project. [6]
- b) Prepare a typical job layout of a Building Project. [4]
8. Write short notes on: (Any two) [6]
- a) Value engineering
 - b) Leadership Styles
 - c) Pre-qualification for the selection of contractors
 - d) Scrap Value and Salvage value

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1. a) Define client and discuss the role of a client during pre tender stage. [4]
b) What is time-cost trade off? Explain the use of time cost trade off with example. [6]
2. a) What do you mean by ABC classification of materials? Discuss importance of material management. [5]
b) Discuss with examples cash-flow management during construction of project. [5]
3. a) Write advantages and disadvantages of using equipment in construction work. [5]
b) Write short notes on grader and dragline. [5]
4. a) Name types of contract and discuss the use of BOOT contracts the context of Nepal. [6]
b) What is pre-qualification of contractor's and why it is necessary. [4]
5. a) Describe the types of maintenance in a project and explain the importance of maintenance of already built projects. [6]
b) What is communication in a project? Discuss its importance. [4]
6. a) What are different types of specification you are aware of rite the importance of specification. [6]
b) Discuss the use of earned value analysis's for performance control in a project. [4]
7. a) What is valuation? Write different methods of valuation. [6]
b) What is material handling system and why is it useful in construction work. [4]

OR

- Discuss most important two roles each of client, consultant and contractor. [4]
8. Write short notes on: (any two) [5×2]
 - i) National building code
 - ii) Advantage and disadvantage of centralization
 - iii) Labor productivity control

Exam.	New Back (2066 & Later Batch)		
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1. a) Discuss on scope of construction management and project life cycle and phases. [6]
- b) Explain ABC classification of Construction material. Discuss inventory planning process for repetitive material. [6]
2. a) Consider the data of a project as shown in table below: [6]

Activity	Immediate Predecessor	Normal time (Week)	Normal Cost (Rs.)	Crash Duration (Week)	Crash Cost (Rs.)
A	-	8	2000	5	2300
B	-	10	4000	8	4300
C	A	6	3000	5	3125
D	A	9	5000	6	5225
E	B	10	2500	9	2700
F	B	13	5000	13	-
G	D, E	5	1000	3	1700

If the indirect cost per week is Rs. 3000, find the optimal crashed project completion time and corresponding minimum cost.

- b) Explain different types of leadership styles. [4]
3. a) Discuss the importance of specification in construction work. Write down detailed specification for cement sand mortar 1:6. [6]
- b) Name types of contract and explain the content of tender document. [6]
4. a) Differentiate between cost and value. Explain different factors affecting valuation of property. [6]
- b) A building having a cubic of 1500 m³ was constructed 15 years ago on a free hold land measuring 1000 m². The building fetched a rent of Rs.12000 per month. What amount will you recommend for advancing a loan on a property against the Mortgage, if the rate of land in that area is Rs. 700 per sq meter? The building has following expenditure headings:
 - Insurance premium Rs. 6000 per annum
 - Repair and maintenance 8% of gross rent
 - Taxes 25% of gross rent
 - Management collection charges 5% of gross rent
 - Redemption of capital is 5%

[6]

5. a) Explain the merits and demerits of using equipments. What are the points that should be consider while selecting appropriate equipment? [6]
- b) List the different type of equipments for concrete construction with their function. Explain briefly. [6]
6. a) Explain the importance of work scope control and material productivity control in construction project. [6]

OR

What is cash flow and how do you prepare it? Explain its importance.

- b) Explain project maintenance and its objective. Differentiate different types of project maintenance. [6]
7. Write short notes on: (any two) [2x5]
- a) Measurement book and Muster roll
 - b) Use of Building code and Quality Control
 - c) Importance of communication
 - d) Pre-qualification of contractors

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Subject: - Construction Management (CE 754)

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt All questions.
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- ✓ Assume suitable data if necessary.

1. a) Write down the function of construction project management in context of Nepal as Nepal needed more infrastructure planning and development. [4]
- b) The details of a project are shown below. If the indirect cost per week is Rs. 300, find the optimal crashed result of the project network. [6]

Activity	immediate Predecessor(s)	Time (Weeks)		Cost (Rs.)	
		Normal	Crash	Normal	Crash
A	-	7	4	1800	2100
B	-	9	7	3500	3800
C	B	5	4	2500	2625
D	A	8	5	4000	4225
E	C	9	8	3000	3325
F	B	11	11	3000	-

2. a) Explain about ABC classification of construction material graphically. How the value of a construction materials can be analysed on the basis of value engineering? Discuss it. [3+3]
- b) Write down the factors to be considered for deciding the extent of mechanisation of construction project. Write short notes on equipment used for highway and pavement construction. [4+4]
3. a) Name contract types and reimbursable contract. Write down the activities to be carried out as preparation before inviting tendering. [4+4]
- b) List down the various components for site preparation, and prepare a typical arrangement facilities of a building construction project in Urban area of Nepal. [4]
4. a) Define material productivity and write down the basic reasons for material productivity control in construction project. [4]
- b) Explain and differentiate between site order book and measurement book. What is muster roll and why it is important? [2+2]
5. a) Write down the objectives of the maintenance. Explain in details about planning and scheduling of maintenance in project maintenance. [2+3]
- b) Define personnel management. Write down the steps of personnel selection in any organisation. [2+4]

6. a) Why specification is important in construction contracts? Write down the specification for Stone masonry work in 1: 6 mortar. [2+4]
- b) Why regulatory requirements are needed in any construction project? How building codes of any country helps in effective urban planning, explain it. [4]

OR

Discuss about safety requirements in a construction site.

7. Define value of any property and what is to be satisfied by any property to have its value. A person desire to sale his property having details as: Gross rent = Rs 5000 per month, total outgoings = 25% of gross rent, estimated future life = 35yrs, area of land = 200 m², estimated value of Land = Rs 2000 per square meter. Determine the fare value of property. Take rate of interest on capital as 10% and rate of redemption of capital as 5%. Assume suitable data, if required. [1+6]
8. Write short notes on: (Any two) [2×4]
- a) Pre-bid meeting
 - b) Methods of valuation of properties
 - c) Material handling system
 - d) BOOT

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 - ✓ Attempt **All** questions.
 - ✓ **All** questions carry equal marks.
 - ✓ Assume suitable data if necessary.
1. Write the various phases of project life cycle. Discuss the relation between Client, Consultant and Contractor in a construction project.
 2. Explain the importances and steps of construction planning and scheduling. Write the application of value engineering in the procurement of construction materials.
 3. Write the factors to be considered in the selection of appropriate construction equipment. Explain equipment for excavation and equipment for compaction.
 4. a) Define Tender Notice and write the essential information that should be included in a Tender Notice.
b) Explain the concept of time cost trade off in determining duration of contract.
 5. Explain the points to be dealt in financial management and cash flow management by a manager in a construction project. Explain how a manager takes decision in controlling project with "earned value analysis"?
 6. Write the responsibilities of 'site engineer' while supervising the work of a contractor. Justify the statement 'prevention maintenance is better than corrective maintenance'. Explain the importance of communication in construction project.
 7. a) State the purpose of specification and write the techniques of specification writing.
b) Write various methods of valuation of properties and elaborate concept of depreciations.
 8. Write short notes on: (any two)
 - i) Material handling system
 - ii) Leadership styles
 - iii) Measurement book
 - iv) Material productivity control

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1. What are the characteristics of Construction Project? Explain. [4]
2. Explain time cost trade off with example. [6]
3. What is material wastage standard? Describe the application of value engineering in procurement of material. [6]

OR

Define economic order quantity. Calculate EOQ and reorder point if rebar required is 1000 tonnes; Ordering Cost is Rs. 10,000; Carrying Cost is 15%, rebar rate is Rs. 90,000 per tonne; Safety Stock is 50 tonnes; lead time is 4 day and consumption per day is 50 tonnes.

4. a) Discuss the methods of tunnel excavation. [6]
b) Discuss Batching and Mixing plant. [6]
5. Classify contract based on payment. Explain lump sum contract and cost plus contract. [2+2+4]
6. Prepare a typical job layout of a Building Project. [4]
7. Define work scope control. Discuss earned value analysis with example. [2+4]
8. Explain procedure to prepare Bills. [4]
9. Describe the types of maintenance in project. [4]
10. Define leadership. What are the characteristics of good leader? Which style is better? [1+3+2]
11. What are the causes of accidents in construction project? How it can be minimized? [2+2]
12. Explain the importance of specification. Write a detailed specification of brick work in cement sand mortar. [3+5]
13. Calculate the value of a building built 10 years ago having a plinth area of 450 sqm, constructed in the land of 1000 sqm. Current market value of land is Rs. 15,000 per sqm and rate of building is Rs. 30,000 per sqm. Assume suitable data if necessary. [8]

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1. Define Consultant. Explain the role of Consultant in maintaining the quality of Construction works. [1+3]
2. Why do you prefer Bar Chart as planning tool? Explain pretender Stage Planning by contractor in Detail. [2+4]

OR

Calculate Minimum Cost and Minimum Duration Schedule using time cost Trade-off analysis of the project with following detail. Indirect cost is Rs. 1000 per day. [6]

Activity	Predecessor	Normal Duration	Crash Duration	Normal Cost	Crash Cost
A	-	5	2	5000	6200
B	A	4	3	6000	7000
C	A	3	2	5000	6500
D	A	6	4	4000	4400
E	B	5	3	15000	18000
F	D	4	2	3000	4800
G	C,E, F	6	3	8000	10400

3. Define A, B and C category of materials. Calculate Economic Order Quantity of Cement with following details; Total Quantity = 12000 bags; $C_i=15\%$, $C_o=10000$; $P = 750$ Rs. per bag. [3+3]
4. What are the disadvantages of using equipment in Construction sites? List out construction equipment used in hydropower and explain any two of them with sketches. [2+3+5]
5. What is BOOT Contract? Explain its importance in Developing Countries like Nepal [2+4]
6. Why cash flow management is necessary for a contractor. Draw a typical cash flow estimate of a contractor showing the most critical stage. [2+3]
7. What are the reasons of excessive material wastage during usage? Explain its preventive measures. [3+3]

or

Perform earned value analysis of a project with five activities as given below. Progress was evaluated at the end of 5th day. [6]

Activity	Cost	1	2	3	4	5	6	7	8
A	6,000	■	■	■					
B	15,000		■	■	■	■	■		
C	10,000				■	■	■	■	
D	4,000							■	■

At the end of 5 th day	% Complete	Actual Cost
A	100%	7000
B	55%	7500
C	40%	3600
D	0%	x

Also comment on the performances.

8. What are the responsibilities of site Engineer in construction site? Explain procedures to prepare bills. [3+3]
9. "Prevention is better than cure" Elaborate it with reference to preventive and corrective maintenance [4]
10. Explain various types of leadership and their suitability in construction projects in Nepal. [6]
11. Why insurance is necessary during construction? Explain. [4]
12. Differentiate between general and detailed specification. Write detailed specification for brick work in 1:4 cement sand mortar. [2+7]
13. Define valuation. What are the purposes of valuation? Explain the factors affecting value of the property [2+3+3]

Or

Workout the value of a Cinema hall from the following data. [8]

- i) Cost of Land = Rs 5 crore
- ii) Gross income = Rs. 2 crore
- iii) Operating Cost = 40% of Gross income
- iv) Repair and Maintenance of machineries = 5% of Capital Cost where capital cost is Rs. 40 lakh
- v) Repair of Hall = 5% of Gross income
- vi) Sinking fund for machineries whose life is estimated 25 years @ 4% after allowing 10% scrap value.
- vii) Insurance premium = Rs 50000 per year
- viii) Assume year's purchase for 60 years at 8% and redemption of capital at 10%.

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1. Write short notes on (Any Three only) [3×4]
 - (a) Tower Cranes
 - (b) Tunnel excavation by Blasting
 - (c) Concrete Batching Plants
 - (d) Road pavers
2. Write short notes on (Any Four only) [4×3]
 - (a) Responsibilities of Site Engineer
 - (b) Measurement Book
 - (c) Safety Requirements
 - (d) Building Codes
 - (e) Diagnostic Maintenance
 - (f) Importance of Maintenance
3. (a) Explain the importance of Specifications in Construction Works [4]
 (b) Write a note on the art and science of writing Specifications covering following aspects [6]
 - (i) Necessity of specification
 - (ii) Procedure of drafting
 - (iii) What to write and what to avoid in writing.
4. (a) Explain the situation where the following method of valuation will be used [3]
 - (i) Cost based method
 - (ii) Plinth area method
 - (iii) Development method
 (b) Work out the valuation of a Cinema hall with the following data [5]
 - (i) Cost of land = Rs. 15,00,000
 - (ii) Gross income = Rs. 90,00,000
 - (iii) Expenses undergone per year to run the Cinema including Staff salary, electricity charges, municipal taxes stationery and printing etc. 30 % of gross income.
 - (iv) Repair and maintenance of machinery, plant and equipment at 5 % of their capital cost which is Rs. 55,00,000
 - (v) Sinking fund for machinery , plant and equipment whose life is estimated as 25 years at 5 % after allowing 10 % Scrap value.
 - (vi) Insurance premium is Rs. 60,000 per annum.

Assume year's purchase for 60 years at 8 % and redemption of capital at 4 % and repair of hall at 2 % of gross income.
5. (a) Discuss on scope of construction management and Project life cycle phases. [5]
 (b) Discuss on Time cost Trade-off with examples and steps in planning. [5]
6. Write short notes on (Any ~~Three~~ ^{Four} only) [4×4]
 - (a) ABC Classification of materials.
 - (b) Material inventory.
 - (c) Types of contract
 - (d) Financial management
 - (e) Prequalification of contractor
7. Write short notes on (Any three only) [3×4]
 - (a) Performance control using EVA
 - (b) Labor productivity control
 - (c) Leadership styles
 - (d) Motivating and directing

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Subject: - Management of Construction and Maintenance (EG776CE)

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- ✓ Attempt any Five questions.
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1. a) Explain the importance of specification in construction work. Write down the main techniques that you follow for writing specification.. [4+4]
- b) Write detailed specification of: [4+4]
 - i) RCC with M20 concrete in column
 - ii) Brick work in 1: 6 cement sand mortar
2. a) What are the responsibilities of site engineer in construction work? Explain the relationship between owner, contractor and consultants. [4+4]
- b) Explain about the process for evaluation of tender and selection of contractor. [8]
3. a) Discuss about the different equipments for tunnel construction. [8]
- b) Enlist the equipment for highway construction and explain any two of them with sketches. [2+6]
4. a) What is job layout? Discuss various factors to be considered in construction site planning. [2+6]
- b) "Preventive maintenance is better than the corrective maintenance". Do you agree with this statement? Explain with suitable example. [8]
5. a) For the activities lying on the critical path of a network, the normal duration and the crash duration along with their respective direct cost are given in the table. [8]

Activity	Normal duration	Normal cost (Rs)	Crash duration	Crash costs (Rs)
1-2	2 days	50	1 day	75
2-3	4 days	160	3 days	225
3-5	9 days	270	6 days	350
5-6	5 days	100	4 days	250

The overhead indirect cost is Rs.30/- per day. Crashing is possible for 1 day for each of the activities 1-2, 2-3, and 5-6 and 3 days for activity 3-5. Find the lowest cost schedule by crashing step by step assuming no fresh critical path is developed on crashing a project.

- b) Among CPM, PERT and bar chart which planning tool do you prefer for building construction? Explain. [8]
6. Write short notes on: (any four) [4×4]
 - a) Process of material procurement
 - b) Purchase or lease of equipment
 - c) Fayol's principles of management
 - d) Maslow's theory of motivation
 - e) Importance of record keeping
 - f) Balance sheet

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b) Write detailed specification of: [4+4]
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1. Write down the detailed specifications for brick work in (1:4) cement sand mortar in superstructure [16]
2. a) Explain the procedures followed after opening and evaluation of a tender in government projects. [8]
b) What is prequalification? Mention various steps to be followed in prequalification and what are the differences between prequalification and post qualification. [8]
3. Describe in detail the operation and application of the following types of excavating equipments with line diagram showing the basic parts. (i) Power shovel (ii) Back hoe (excavator) (iii) steel roller (3 wheeled) [16]
4. a) Explain the main considerations necessary in the storing and stacking of civil engineering materials. *p.le q sd* [8]
b) Explain the importance of preventive maintenance in roads and buildings and also mention various types of maintenance. [8]
5. a) ~~What~~ What are the principles of management and compare administrative principle and management principle. [8]
b) Describe balance sheet and profit and loss account and their functions. [8]
6. Write short notes on: (any four) [4x4]
 - a) Tunnel boring machines
 - b) Batching and mixing in concrete construction
 - c) Centralization and decentralization
 - d) Barriers of communication
 - e) Building code
 - f) Cost control *colg manual*

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 INSTITUTE OF ENGINEERING
Examination Control Division
 2068 Bhadra

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1. a) Discuss the importance of specifications in construction work. Write down detailed specification for cement sand mortar (1:4) [8]
- b) What is contractor's prequalification and why it is necessary? What are the advantages and disadvantages of prequalification? [8]
2. a) How does corrective maintenance differs from preventive maintenance? Describe the importance of maintenance on highways. [3+5]
- b) Explain the procedures for opening and evaluation of bid in construction project. [8]
3. a) The following information are available about various activities of the network. Determine least cost schedule. Project overhead cost are Rs 2000 per week. [10]

Activity	Normal Duration	Normal cost	Crash Duration	Crash cost
1-2(A)	4	4000	3	7000
1-3(B)	8	5000	7	8000
2-3(C)	5	3000	3	1000

- b) Elaborate the factors to be considered to reduce accident while working with machine. [6]
4. a) What is motivation? Why it is necessary in construction sites? Explain Herzberg's theory of motivation. (Pg 175-180) [8]
- b) Explain steps of procurement procedure for materials in Government offices. [8]
5. a) Discuss any two types of excavating and earth moving equipment in detail. [8]
- b) List different types of tunneling and rock drilling equipments. Explain briefly. [8]
6. Write short notes on: (any four) [4×4]
 - a) Scientific theory management
 - b) Compacting machines
 - c) Equipment for lifting
 - d) Trade unions and relation with management
 - e) Importance of record keeping for construction
 - f) Building code
 - g) Safety regulation

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1. Write down the detailed specifications for brick work in (1:4) cement sand mortar in superstructure [16]
2. a) Explain the procedures followed after opening and evaluation of a tender in government projects. [8]
b) What is prequalification? Mention various steps to be followed in prequalification and what are the differences between prequalification and post qualification. [8]
3. Describe in detail the operation and application of the following types of excavating equipments with line diagram showing the basic parts. (i) Power shovel (ii) Back hoe (excavator) (iii) steel roller (3 wheeled) [16]
4. a) Explain the main considerations necessary in the storing and stacking of civil engineering materials. [8]
b) Explain the importance of preventive maintenance in roads and buildings and also mention various types of maintenance. [8]
5. a) What are the principles of management and compare administrative principle and management principle. [8]
b) Describe balance sheet and profit and loss account and their functions. [8]
6. Write short notes on: (any four) [4×4]
 - a) Tunnel boring machines
 - b) Batching and mixing in concrete construction
 - c) Centralization and decentralization
 - d) Barriers of communication
 - e) Building code
 - f) Cost control

02 TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2066 Magh

Exam. Level	Regular/Back		
	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Management of Construction and Maintenance

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt any **Five** questions.
- ✓ The figures in the margin indicate **Full Marks**.
- ✓ Assume suitable data if necessary.

1. What are Bid bond and Performance bond? Explain the procedures to be followed in pre-qualifying contractors for bidding for the construction of a commercial complex of Rs. 500 million estimated cost. [16]
2. Describe the different equipments used for road-construction. Explain the functions and sequence of operation of paver and bitumen sprayer. [16]
3. a) Describe in detail the relationship among Owner, Contractor and Engineer in any construction project. [8]
b) Explain the concept of 'time cost trade off' with illustrations. What do you mean by crashing of a project activity? Your boss is asking you to reduce the time schedule of a project considerably, what do you suggest? [8]
4. a) Interview is considered as an important step in selecting people for the job, what abilities of a candidate are viewed during an interview? Explain. [8]
b) What is material handling? Explain. What factors would you consider in material handling? [8]
5. a) Explain maintenance needs and types of maintenance. Describe balance sheet and profit and loss account and their functions. [8]
b) What is motivation? Explain the concept of motivation using Maslow's need hierarchy and Herzberg's two factor theories. [8]
6. Write short notes on: (any four) [4x4]
 - a) Barriers of communication
 - b) Centralization and decentralization
 - c) Advantages and disadvantages of trade union
 - d) Tunnel boring machines
 - e) Batching and mixing in concrete construction

Exam. Level	Back		
	BE	Full Marks	80
Programme	BCE	Pass Marks	32
Year / Part	IV / II	Time	3 hrs.

Subject: - Management of Construction and Maintenance

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt any Six questions.
- ✓ All questions carry equal marks.
- ✓ Assume suitable data if necessary.

1. a) How do you differentiate between the general specification and detailed specification for a particular work?
b) Explain various important points which should be considered while preparing detailed specifications.
2. a) Write the names of different types of contracts used in Civil Engineering. Which type of contract is used for Government works? Why?
b) How are tenders scrutinised and compared before the selection of the tender is made? How is a tender to be chosen?
3. Discuss any two types of excavating and earth moving equipment in detail. Give sketches.

OR

What are different types of tunneling and rock drilling equipment? Explain briefly.

4. Write short notes on (any three)
 - a) Tower Cranes
 - b) Concrete Mixers
 - c) Use of CPM and Bar Charts
 - d) Safety Regulations
 - e) Cash Flows
5. a) Mention the various factors effecting the selection of construction equipment.
b) Explain how "Preventive maintenance is better than corrective maintenance".

OR

Explain the steps involved in diagnosing the problem affecting a structure for which rehabilitation is to be done.

6. a) Explain the characteristics of supervisory and leadership style.
b) Describe briefly the characteristics of training and selection method.
7. Write short notes on (any four)
 - a) Site order book
 - b) Material handling system
 - c) Time-cost trade off
 - d) Balance sheet
 - e) Building codes
 - f) Communication
 - g) Importance of quality control

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Subject: - Management of Construction and Maintenance

- ✓ Candidates are required to give their answers in their own words as far as practicable.
- ✓ Attempt any ***Five*** questions.
- ✓ ***All*** questions carry equal marks.
- ✓ Assume suitable data if necessary.

1. What is performance bond? Prepare a tender notice for selecting contractor for the construction of a commercial complex of Rs. 100 mln cost. Assume necessary data as you require.
2. Name and discuss the equipment used for earthwork in excavation and pavement construction.

OR

List different types of cranes and discuss in brief with sketches.

3. a) What is cash flow? Explain the procedure how you prepare cash flow for a construction project.
b) How you fix duration of a construction project. What is time cost trade off? Explain.
4. a) Write steps you follow in procurement of 10000 bags of cement for a commercial complex.
b) In the selection of personnel for a project, what would you consider in the interview? Explain.
5. a) Explain maintenance needs and all types of maintenance. Prepare chart with figures, the balance sheet and profit and loss account and explain the functions.
b) Explain the need of communication, flow, barriers and breakdown of communication. And also explain decision making levels and stages.
6. Write short notes on (any three):
 - a) 14 principles of administration management by Fayol
 - b) Advantages and disadvantages of trade union
 - c) Centralization and decentralization
 - d) Supervisory style and types of leadership
 - e) Equipment for tunnel boring
 - f) Concrete mixers
