Advanced Construction Equipments

Assignments

1. Pile Foundations

1. What is the meaning of the term pile foundation? Explain uses of piles
2. Mention advantages and disadvantages of cast in situ and pre cast concrete piles.
3. What is pile foundation? Explain under which condition you would prefer pile foundation.
4. Differentiate between End bearing and Friction piles.
5. Explain the method of construction of under reamed piles with help of neat sketch.
6. Explain pile driving. Give different equipments used for pile driving with its specific uses?
7. Explain pile accessories with figure.
8. Explain under reamed piles and timber piles.
9. What is group efficiency of piles? Describe in short various methods to determine group efficiency of piles.
10. Write short note on Vibroflotation.
11. Write short note on sand piles with its advantages and disadvantages.
12. Compare: (i) Cast in situ piles and pre cast piles. (ii)End bearing pile and friction pile
13. What are the most common causes of failure of piles?
14. Describe in brief, various reasons of pulling out of piles from their positions? What are the methods adopted for it?
15. Write short note:(i) Franki piles(ii) Pile cap and pile shoes

2. Caissons

1. What is a pneumatic caisson? Where is it adopted? How is it constructed?
2. What are the factors to be considered, while making choice between coffer dam and caisson?
3. Sketch typical well caisson. Discuss function of each element of well caisson
4. Discuss various cutting edges for caissons with their merits and demerits.
5. Explain Pneumatic Caisson in detail with neat diagram.
6. What is a monolith? Explain with figure.

3. Diaphragm wall

1. Give different uses for application of diaphragm wall for a given site?

4. Coffer Dams

1. Discuss in detail Ohio river type wood sheeting cofferdam
2. What is cofferdam? Which are its uses? Enlist common types of cofferdams.
3. Explain in detail the economic height of cofferdam
4. Discuss various factors governing the selection of type of cofferdam.

5. Control of Ground water in Excavations

1. Enlist various methods of controlling ground water during construction and suggest their suitability for different soil conditions. Explain with sketches any two methods.

2. Describe method of well point system for dewatering of foundation soils
3. Explain with neat sketch Cement grouting process to control the ground water in construction.
4. Enlist various methods of ground water control. Discuss any two methods with neat diagrams.

6. Form work

1. What is formwork? Explain formwork for following form works.
   1. R.C.C. Beam and slab floor. 2. Columns 3. Stairs 4. R.C.C. wall
2. What is centering? Explain in brief. Briefly explain its types.
3. Why steel formwork is preferred? Explain with neat sketches, the centering for Big arches.
4. What are the factors affecting the type and design of centering for big arches and mention the good features of such a centering.
5. What is false work? Discuss the causes of failure of false work.
6. Explain requirements of formwork.
7. Write a note on Slip Formwork? OR What is slip formwork? Explain their operation, uses, and advantages.
8. Why formwork is necessary? Which are the materials used for preparing formwork?
9. Discuss stripping/removal time of various form works.

7. Tall structures

1. Write short note on Tall structure.
2. Write short note on “Methods of construction of Tall Structures”.
3. Discuss the structural system of tall structures.

8. Demolition of Structure

1. List methods of demolition and explain below methods
   1. Machine demolition 2. Hammering 3. Hitting 4. Jack up 5. Hydraulic breaker
2. What is meant by Demolition? What are the factors affecting the evaluation of demolition methods?
3. Describe commercial types of explosives in brief.
4. List out methods of demolition. Explain wrecking ball method of demolition?
5. Briefly explain the methods of demolition. (Explain all methods except explained in above questions.)
6. Describe the procedure of safe demolition of structures.

9. Construction Equipment

1. Define following terms (1) Depreciation (2) Investment cost (3) Obsolescence cost (4) Down Time (5) Scrape value (6) Replacement cost (7) Maintenance charges (8) Operating Cost
2. State factors affecting in selection of equipment in construction industry. OR Enlist the various factors affecting equipment selection. Explain any four of them.
3. Explain in detail various financial aspects of procuring construction equipment
4. Discuss Rim pull and Drawbar pull and Gradability in detail.
5. How would you determine economic life of construction equipment?
6. Give the classification of construction equipments. Also discuss the importance of construction equipments.

7. Estimate book value of equipment using sinking fund method at the end of each year for following data.
   - Initial cost of equipment: Rs. 50,00,000
   - Life of equipment: 7 years
   - Salvage value: 8% of initial cost of an equipment
   - Rate of Interest = 14%
8. Explain sinking fund method for calculation of depreciation?
9. Calculate the depreciation for each year by sum of digits method for the construction equipment having purchase cost of Rs 10,000/- and scrap value at the end of useful life of five years equal to 10% of its original purchase price.
10. For construction equipment following information is available.
    - Initial cost of acquisition = Rs. 65,00,000
    - Cost of tyre sets Rs. 3,50,000/- to be replaced after every 30000hours of operation.
    - Cost of major overhaul and repairs Rs. 8,00,000 to be carried out after every 4500hours of operation.
    - Cost of fuel, lubricants and minor repairs and maintenance Rs. 1100/- per hour.
    - Estimated life of machine = 14,500 hours of operation.
    - Estimated salvage value = 15% of initial cost
    - Estimate usage of equipments = 1500 hours per year

    If MARR is 20% per year, estimate minimum hourly rental charges for equipments.

10. Excavating equipments

1. Write short note on (i) Crawler Tractor (ii) Wheel tractor
2. What are the purposes of bulldozers on the construction site?
3. What are the functions of rippers? How economy can be achieved in ripping rocks?
4. What are the uses of power shovels? Describe with neat sketch basic parts and operation of power shovel. Explain operation of power shovel.
5. Describe briefly the earth rammers.
6. Discuss advantages and disadvantages of Draglines and Clamshells.
7. Briefly explain the inter-relationship amongst material to be excavated, bucket type, bucket size, boom length and boom angle for safe and efficient dragline operations.
8. Discuss advantages and disadvantages of Scrapers.
9. Explain the factors influencing the output of HOE.

11. Hauling & conveying equipments

1. Write short note on Gantry Cranes.
2. Describe Travelling tower cranes.
3. What is concrete pump? What are the advantages of transportation of concrete by pumps?
4. Discuss belt conveyors with neat figure.
5. Discuss the economy in transporting material with a belt conveyor compared with other methods of transportation, giving example.
6. Give different methods of boring with respect to site conditions?
7. Enlist various crushers and discuss any Jaw crusher in detail.
8. Write a note on Impact crusher.
9. Classify compressors. Explain Axial-flow compressors in detail.
10. What is concrete batching plant? Give a general layout plan for a concrete batching plant?
11. What is Tunnel Boring Machine? What are its uses and advantages?