

**V.S.B. ENGINEERING COLLEGE, KARUR  
DEPARTMENT OF CIVIL ENGINEERING**

**Year/Semester : III / V – ‘A’ & ‘B’ Section**  
**Subject Code & Name : CE 6501 – STRUCTURAL ANALYSIS I**

**ASSIGNMENT QUESTIONS**

1. Basics concepts of force method.
2. Basic concepts of unit load method.
3. Applications of force method.
4. Concepts of slope deflection method.
5. Concepts of moment distribution method.
6. Energy method and it's applications.
7. Importance of influence lines and it's uses.
8. Influence lines for member forces in pin-jointed frames.
9. Influence lines for member forces in rigid-jointed frames.
10. Begg's deformeter, its components and uses.
11. Arches and types of arches and its applications
12. Types of arch structures
13. Most popular arch structures in world
14. Truss and its important components and its applications
15. World's most wondered truss structure.
16. Temperature and settlement effects of arches.
17. Various methods of structural analysis
18. Various software packages of structural analysis.
19. Importance of structural analysis in civil engineering.
20. Importance of structural analysis in planning and execution process.
21. Steps involved in structural analysis of any structures.
22. Muller's Breslau's principle

23. Types of structures and components.
24. Neylor's simplification.
25. Differences between three hinged, two hinged and fixed arches.
26. Types of beams and types of supports.
27. Types of frames.
28. Moving loads and its transmission.
29. Analysis procedure of bridges (moving loads and rolling loads)
30. Types of loads in beams and its deflections.
31. Types of beams and its reactions and moments.
32. Difference between pin jointed and rigid jointed frames.
33. Difference between sway and non-sway mechanism.
34. Differentiate energy and deformation methods.
35. Differentiate strain energy and consistent deformation methods.
36. Fundamentals of structural mechanics and analysis.
37. Classical and modern methods of structural analysis.
38. What are the various types of joints and supports available in structures.
39. Concepts of indirect model analysis.

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**Year/Semester : III / V – ‘A’ & ‘B’ Section**  
**Subject Code & Name : CE 6502 – FOUNDATION ENGINEERING**

**ASSIGNMENT QUESTIONS**

1. What are the factors consider for the depth of exploration in the proposed site?
2. Give the codal provisions of penetration resistance to identify the soil type.
3. Illustrate the Geophysical method of soil Investigation.
4. Discuss the IS code recommendation for the selection of spacing and depth of bore hole for various projects.
5. Justify the types of foundation for different soils.
6. What are the semi direct methods considered for soil exploration in the field?
7. How to calculate the shear strength parameters?
8. Discuss the methods to reduce the settlement of the structures.
9. Discriminate the bearing capacity for various types of soil.
10. What are the failures occurs in the footing of structures?
11. Discuss the permissible settlements recommended by IS codes?
12. Enumerate the factors governing the selection of permissible settlement.
13. Discuss the causes of settlement of the structures.
14. Explain in detail about IS code method for computing the bearing capacity of soil with various types of failure and shape factor.
15. Discuss the design procedure for rectangular combined footing.
16. Explain the conventional methods of design of raft foundation.
17. Discuss the design procedure for trapezoidal combined footing.
18. Discuss the design procedure for mat foundation by elastic methods.
19. Design a square footing of short axially loaded column of size 300mm X 300mm carrying 600kN load. Use M20 concrete and Fe 415 steel. Adopt SBC of soil is  $180 \text{ kN/m}^2$ . Sketch the details of reinforcement.
20. Design a rectangular combined footing for two columns 6m c/c apart. The exterior column size is 0.5mX0.5m and it carries 1500 kN load. The interior column is of size 0.3m X0.3m and it carries a load of 1000kN. the projection of footing beyond left column is 0.7m from

centre and 1.8m beyond right side column centre take allowable soil pressure as 200 kN/m<sup>2</sup>.

21. Briefly explain the wash boring and rotary drilling.
22. A square footing for a column is 2.5 m X 2.5 m and carries a load of 2000 kN. Find the factor of safety against bearing capacity failure, if the soil has the following properties' = 50 kN/m<sup>2</sup>,  $\phi = 20^\circ$ ,  $\gamma = 17.6$  kN/m<sup>3</sup>,  $N_c = 12.5$ ,  $N_q = 4.5$  and  $N_r = 2.5$ . The foundation is taken to a depth of 1.5 m.
23. Brief the plate load test conducted to determine the bearing capacity and settlement with neat sketches.
24. Explain any two important types of samplers
25. Size of an isolated footing is to be limited to 1.5 meters square. Calculate the depth at which the footing should be placed to take a load of 200 kN, with a factor of safety 3. The soil is having angle of internal friction  $\phi = 30^\circ$ . The weight of the soil is 21 kN/m<sup>3</sup>. Bearing capacity factor for  $\phi = 30^\circ$ ,  $N_q = 22$  and  $N_\gamma = 20$ .
26. A footing 2.4 m square carries a gross pressure of 350 kN/m<sup>2</sup> at a depth of 1.2 m in sand. A saturated unit weight of sand is 20 kN/m<sup>3</sup> and the unit weight of sand above water table is 16 kN/m<sup>3</sup>. The shear strength parameters are  $c = 0$  and  $\phi = 30^\circ$  (for  $\phi = 30^\circ$ ,  $N_q = 22$ ,  $N_r = 20$ ). Determine the factor of safety with respect to shear failure for the following cases:
  - W.T is 5 m below the ground level
  - W.T is 1.2 m below the ground level
27. Find the plan dimensions of rectangular combined footing to support two columns 250 mm X 250 mm and 300 mm X 300 mm carrying loads of 400 kN and 600 kN respectively. The columns are spaced at 4 m c/c. the allowable bearing capacity of the soil is 200 kN/m<sup>2</sup>.
28. Explain the under – reamed pile foundation with neat sketch.
29. A building is to be supported by raft 20 m X 10 m. the weight of the building and the load it can carry may be assumed to be 25,000 kN. The subsoil is clay having unit weight of 19.02 kN/m<sup>3</sup> and an unconfined compressive strength of 70 kN/m<sup>2</sup>. The factor of safety against bearing capacity failure is 3. At what depth should the raft foundation be placed? Also determine the depth for a fully compensated foundation. Use Skempton's equation
30. What are the different types of raft foundations?
31. What are different types of piles and their functions?

32. Explain the active and passive states of earth pressure acting on a retaining wall.
33. Explain the Coulomb wedge theory with neat sketches
34. Explain the Culmann's graphical method and the effect of line load
35. A retaining wall is 4 meters high. Its back is vertical and it has got sandy backfill upto its top. The top of the fill is horizontal and carries a uniform surcharge of 85 kN/m<sup>2</sup>. Determine the active earth pressure on the wall per metre length of wall. Water table is 1m below the top of the fill. Dry density of soil = 18.5 kN/m<sup>3</sup>. Moisture content of soil above water table = 12%. Angle of internal friction of soil = 30°, specific gravity of soil particles = 2.65. Porosity of backfill = 30%. The wall friction may be neglected.
36. A trapezoidal footing is to be produced to support two square columns of 30cm and sides respectively. Columns are 6 meters apart and the SBC of the soil is 400 kN/m<sup>2</sup>. The bigger column carries a load of 500kN and the smaller carries a load of 3000kN. design a suitable size of the footing so that it does not extend beyond the face of the columns.
37. Explain why the displacement necessary to produce the passive state is much more than that required producing the active state?
38. Explain the dynamic formulae for estimating the load carrying capacity of a single driven pile.
39. A group of nine piles, 12m long and 250mm in diameter, is to be arranged in a square form in a clay soil with an average unconfined compressive strength of 60 kN/m<sup>2</sup>. Work out the centre to centre spacing of the piles for a group efficiency factor of 1. Neglect bearing at the tip of the piles.

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**Year/Semester** : III / V – ‘A’ & ‘B’ Section  
**Subject Code & Name** : CE 6503 – ENVIRONMENTAL ENGINEERING I

**ASSIGNMENT QUESTIONS**

1. Where does your drinking water come from? Describe the source of your water at home or school, how it is treated, and how it is conveyed from the source to the distribution system.
2. What are the causes for the global warming and what are the impacts of it?
3. Explain about the public water supply scheme provided at your locality.
4. Explain the need and necessity of proper sanitation for a town.
5. Explain the terms BOD and COD and their importance with respect to environmental pollution.
6. What are the various water treatment plants implemented in our country?
7. How treatment plants play a vital role in our daily needs?
8. Explain about the advanced water treatment methods and its advantages.
9. Explain briefly the new method to detect the leakage of water in the pipelines.
10. Briefly explain the different tests to be conducted on pipelines before putting them into service.
11. Explain the water service connection in your locality with neat diagram.
12. How will you recycle the waste effluents from treatment plants in an effective way?
13. How nanotechnology is implemented in the modern water treatment methods?
14. Do you think chlorine is a best disinfectant? Justify it.
15. How will you attain zero discharge and explain the methods to attain it?
16. How will you determine the per capita demand in a particular area?
17. Effects of Water Pollution on Human?
18. Effects of water on aquatic life?
19. How to reduce the water waste with modern technology?
20. Describe the factors to be considered in fixing the design period for water supply components.
21. Role of Environmental Engineers in water supply projects.
22. Role of Environmental and Civil Engineers in sustainable development.
23. How will you treat water at your home?

24. Describe about various sources of water.
25. Explain the techniques involved in defluoridation.
26. Why service reservoir is needed?
27. Why the water should be adopted to disinfection process?
28. What are the materials can't be used in water supply? Why?
29. How will you predict the population of future? How accurate it will be?
30. Why various pumps are used in water supply? Explain in own words.
31. Why sedimentation tanks are used in Water treatment? Where it will be used?
32. Explain the factors those influencing the water transmission from source to house.
33. How will you choose the water treatment process based on the source of it?
34. Why aeration is adopted in water treatment? Give its advantages over other operations?
35. How will you remove excess iron and manganese from groundwater?
36. What are the standards and limits of drinking water?
37. How will find the leakages in water supply system with latest equipment?
38. Explain the current computer softwares that can be used in piping system designing?
39. What are the methods used for the transmission of water from source to house?

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**Year/Semester : III / V – ‘A’ & ‘B’ Section**  
**Subject Code & Name : CE 6504 – HIGHWAY ENGINEERING**

**ASSIGNMENT QUESTIONS**

1. What is the history of Highway Engineering?
2. Explain About Ancient Roads? (international)
3. Elaborate the importance and necessity of highway planning
4. What are the Road construction techniques followed?
5. What are the environmental impacts of highway?
6. How can we minimize the pollutions due to highway facilities?
7. Give an account of road network in India.
8. List and brief about the national highways in India with their number.
9. Give an account of National Highways Development project.
10. Give an account of Indian expressways.
11. Write about the transportation system in India.
12. What is a detailed project report in highway engineering. Give detail.
13. Elucidate the importance of transportation.
14. Explain in detail about different modes of transportation.
15. Give an detail account of the materials used in highway construction.
16. Environmental and social issues in highway development.
17. Explain how the transportation plays a major role in the development of rural areas in India.
18. Draw the various road patterns and explain
19. What are the studies taken up for planning a highway. Elaborate them.
20. What is a master plan in a road development plan and explain about the details included in it.
21. Give a detail account of First twenty year road development plan.
22. Give a detail account of second twenty year road development plan.
23. Give a detail account of third twenty year road development plan.
24. Explain briefly the various stages of work in a new highway project.
25. Discuss about the realignment of a highway. Explain how the work is carried out.

26. Elaborate the significance of soil as highway material.
27. What are the desirable properties of subgrade soil? Enumerate the identification and classification tests of soils.
28. Explain various classification of soil.
29. Explain the mechanics of soil compaction and optimum moisture content.
30. What are the various tests for judging the suitability of road stones for pavement construction? Discuss the objects of carrying out each of these tests.
31. What are the different types of bituminous materials used in road construction? Under what circumstances each of this material is preferred.
32. What are the various tests carried out on bitumen? Briefly mention the principle and uses of each test.
33. Explain Marshall Method of bituminous mix design with sketch.
34. Describe the materials used for cement concrete pavement construction; explain the specified tests.
35. Explain ESWL. Explain the method of determination of ESWL
36. What are the special features of the following type of roads: continuously reinforced concrete pavement with elastic joints.
37. Explain about NH 7 history.
38. Explain steel fibre reinforced concrete pavement
39. Explain interlocking concrete block pavements.

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**Year/Semester**

**: III / V – ‘A’ & ‘B’ Section**

**Subject Code & Name**

**: CE 6505 –DESIGN OF REINFORCED CONCRETE ELEMENTS**

**ASSIGNMENT QUESTIONS**

1. Explain in detail about Burj Kalifa Construction.
2. Explain in detail about Modern Methods of Construction.
3. Write about the biggest dams in the world with all details.
4. Explain about longest bridges in the world with all structural details.
5. List 10 biggest dams in India and explain all the structural details involved in the dams.
6. List 10 longest bridges in India and explain all the structural details involved in the bridges.
7. Write all the details about all the dams in Tamil Nadu.
8. Give Storage capacity of comparison statement Tamil Nadu dams and Karnataka dams.
9. List and explain the tallest buildings in India.
10. Give top 10 ongoing construction projects in India.
11. Explain in detail about Slender Column.
12. Explain in detail about Flat Slabs.
13. Write an article about Stair case design.
14. Explain in detail about Mat/Raft footing design.
15. Write an article about beam column joint reinforcement design.
16. Write an article about the floating buildings with an example.
17. Explain in detail about rotating buildings with an example.
18. Explain in detail about twisted buildings with an example.
19. Write an article about 10 ancient buildings in the world.
20. Write an article about Seven Wonders of the World.
21. Write an article about 10 ancient buildings in India.
22. Write an article about 10 ancient buildings in Tamil Nadu.
23. Write an article about U-Boot technology.
24. Write an article about nano technology in civil engineering.
25. Explain in detail about modern construction methods.
26. Write an article about demolition techniques available.

27. Explain in detail about reinforcement alignment in slabs and beams with an example.
28. Explain in detail about reinforcement alignment in columns and footings with an example.
29. Write an article about earthquake resistant structures.
30. Explain in detail about ductile detailing.
31. What are the methods available for earthquake resistant structures?
32. Write an article about dampers in earthquake resistant design.
33. Write an article about step by step procedure of demolition of building.
34. Write an article about stages of construction of a multi storey building.
35. What are the types of bridges available in the field? Explain in detail.
36. Write an article about stages of construction of a bridge structure.
37. Write an article about construction of a dam structure.
38. Write an article about water way project in India (Linking of rivers).
39. Write an article about Palm tree island construction.

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**Year/Semester : III / V – ‘A’ & ‘B’ Section**  
**Subject Code & Name : CE 6506 –CONSTRUCTION TECHNIQUES EQUIPMENT AND PRACTICE**

**ASSIGNMENT QUESTIONS**

1. Explain the various types of special concretes
2. What are the applications of high volume fly ash concrete?
3. What is the application of silica fume concrete?
4. Explain the manufacturing process of light weight concrete and GGBS concrete.
5. Write about shotcreting.
6. What are the applications of pervious concrete?
7. What are the properties of fiber reinforced concrete
8. What are the advantages of precast concrete members?
9. Explain about single design model in construction.
10. Create your own idea on the sequence of activities.
11. Can you apply your thoughts on the ways that you can manage the quality of concrete?
12. How do you construct a bridge using new techniques?
13. Explain briefly about the different types of articulated structures with suitable examples.
14. What are the real world problems of construction practices and what will be the solution?
15. Explain the construction using rat trap model of construction.
16. Explain the various types of cements available in the market.
17. Visualize a cement manufacturing plant and draw it briefly with all the processes.
18. What do you prefer a ready mix concrete or site manufactured concrete? Place your views regarding the same.
19. What are pollution problems that arise due to the cement manufacturing plant and how can you rectify it?
20. Pen your views on the different admixtures available and arrange them according to their usage.
21. What is meant by Permanent Modular Construction? Share your ideas on it.
22. Explain the green building concept of the building construction.
23. When can you think our country will be the one of the greatest infrastructure developed country in the world and what are the ideas you can place?
24. Explain any one type of flooring with a neat example.
25. Compare and contrast the stone and brick masonry in a brief manner.
26. Why dampness is caused in the building and how can you rectify it?
27. Explain about various types of roofing normally used for construction.

28. Where the hot weather concreting practiced in the world and explain their difficulties shortly?
29. Which is stronger? A ready mix concrete or a manufactured concrete at the site.
30. Say in detail about the advantages of brick masonry over the stone masonry.
31. Explain the various types of techniques for constructing domes.
32. Put in your own words about the dewatering techniques followed in our state.
33. Explain different types of cofferdam with neat sketches.
34. What type of bond is mostly practiced in India and state your reasons.
35. Can you suggest replacement of aggregates by any other material?
36. What are the different types of foundation you know and explain with neat drawings?
37. Explain different types of cranes used for construction lifting practices.
38. Describe the self healing and self compacting concrete in detail.
39. Why are precast concrete piers seldom used in seismic region?