Year: - Second Year B Arch. Subject: - BCM III Pattern: - 2019

1. Define soil mechanics
2. Explain the ingredients of soil based on following criteria's size bond strength / cohesiveness with examples.
   a Explain four type of soil found in India mention the region and characteristics of soil
   b On a political map of India highlight the type of soil found with help of different colours or textures provide legends for the same.
3. Tabulate the types of soil and their soil bearing capacities.
4. With help of sketch explain the concept of bulb of pressure for stress isobar.
5. Define the following
   a Ultimate bearing capacity
   b Safe bearing capacity
   c Allowable bearing pressure In a tabular format explain the properties of soil
6. Why is it important to do a soil investigation?
7. Explain in brief with sketches
   1. Tree diagram showing all foundations
   2. Shallow foundations:-
   2A. Strip foundations 2B. Isolated footings 2C. Combined footing.
   3. Deep foundations:-
   3A. Pile foundations (End bearing and friction piles) 3B. Raft or mat foundations
   4. Machines foundations (Any two types)

8. Explain the requirements of good concrete.
9. Calculate the percentage of cement in concrete for following proportions –
   1:2:4 - M15 5
   1:1.5:3 –M30 5
10. Explain the concept of water cement ratio
11. Write a short note on Grades of concrete & Cement
12. Explain the properties of good qualities of sand
13. Explain the quality of water good for RCC construction
14. Explain compressive strength & characteristic strength of concrete.
15. Explain the slump test & Cube test of concrete with sketches
16. Explain the processes, advantages, disadvantages of following types of flooring
    a. IPS flooring
    b. Tre mix flooring
    c. Epoxy Flooring
    d. Terrazzo flooring
17. Explain any one type of any resilient timber floor used for basketball court or gymnasium.
18. Explain flexible and rigid pavement.
19. Comparative analysis between Pre cast construction and cast in situ construction
20. Explain the advantages and disadvantages of Pre-cast concrete construction
21. Draw neat and labelled diagram of the following junction details of pre-cast concrete structural elements,
    a. Pre-cast Footing to column connection
    b. Column to beam connection
    c. Beam to slab connection
    d. Staircase flight to landing connection
    e. Staircase Landing to intermediate beam.

22. An outhouse admeasuring 3m x 3.5 m with an attached toilet of size 1.2 m x 2.1 m is to be constructed in RCC frame structure and 2530 mmm thick brick walls. Draw a framing plan at plinth level and a section up to a plinth level through room & toilet, showing plinth formation, footings and other relevant RCC members of the structure. Scale 1:20
23. A shop of size 3 m x 3 m x 4.5 m height needs to be constructed in RCC frame structure. It has flat roof and plinth height of 600 mm from the ground. Draw sectional elevation & plan showing all RCC elements. Also draw detailed section through plinth showing RCC footing & plinth Beam.
24. A site office of size 4 m x 2.5 m needs to be constructed in RCC frame structure, having 1.2 m wide projecting plinth in front along the longer side having steps to climb up to it. The office is divided equally in two cabins with 150 mm thick wall having two separate entry doors. Assume plinth as 600 mm from the ground level. Draw key plan showing above features and framing plan with plinth beams, columns & foundations. Also draw detailed section through steps and plinth up to foundation.
25. Draw neat & labelled sketches-
    a. Section showing formwork for beam & slab junction
    b. Two types of piles used in non-cohesive soil condition
    c. Longitudinal section of typically simply supported beam showing reinforcement details
    d. Any two types of shallow foundations