

CSM—21/24
PART—II/PAPER—VII
CIVIL ENGINEERING
PAPER—II

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Time : 3 Hours

Full Marks : 250

*The question paper contains **18 (Eighteen)** questions in **GROUP—A, (12)** and **GROUP—B, (06)** together.*

GROUP—A

*Candidates to attempt **10 (ten)** questions within word limit of **250**.*

*Each question carries **15** marks.*

1. State the principles of a good brick bonding in a masonry wall. Distinguish between English bond and Flemish bond with neat sketches.
2. What do you mean by orientation of a building? Describe the various criteria used in deciding the orientation of a building. State the salient features of an energy-efficient building.
3. What do you mean by a batching plant? Explain the components, capacity and functions of a batching plant. Explain RMC and its advantages.
4. What is the difference between points and crossings? Draw the line diagram of a right-hand turnout and show the different components.
5. Describe the procedure adopted in the construction of a gravel road. Distinguish between flexible pavement and rigid pavement w.r.t. geometry of layers, preference, cost and maintenance.
6. Enumerate the aims and objectives of a traffic survey. Explain the functions of various rotary design elements.

7. What are the various methods adopted for flood forecasting? Explain any one method of flood forecasting. What do you mean by flood routing?
8. Explain the various distribution systems adopted for canal irrigation. How can you improve the salinity condition of a waterlogged soil?
9. Describe the salient features of the principles and design of weirs on a permeable foundation. Explain the energy dissipation device in a spillway.
10. Draw a flow chart to show the sequential treatment units of a typical water treatment plant with source of water collected from a perennial river. Explain the physical, chemical and microscopical characteristics of water.
11. Explain the various steps associated with the design of a sewer system. Describe the importance of the COD test of sewage.
12. Explain various methods of collection and disposal mechanism of solid waste which can be taken up by the Municipality. Describe the concept of activated sludge process.

GROUP—B

Candidates to attempt 05 (five) questions within word limit of 300.

Each question carries 20 marks.

13. What are the various provisions of NBC which are to be adopted in construction of residential apartments in cities? Explain the concept of cost analysis and resource allocation in a construction project.
14. Explain why all the contours must form closed loops. Explain the basic principles and applications of photogrammetry. Draw the figure of a transition curve and show the different components.
15. Enumerate the various types of failures observed in a flexible pavement. How these pavements can be strengthened? Explain various steps associated with maintenance of permanent ways.

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16. Draw the figure of a septic tank and show the different components. Describe the step by step procedure for design of a septic tank for 30 domestic users.
17. Explain the concept of regime theory. Design a trapezoidal canal section in alluvial soil carrying a discharge of 30 cumec by applying Lacey's regime equation. Assume Lacey's silt factor as 1.0 and side slopes of 0.5 : 1. Assume any other data, if required.
18. Explain any one method of air pollution control to be taken by the Municipality. Describe the salient features to be taken into account for environmental impact assessment for establishment of a new mega steel plant at Keonjhar.

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SPACE FOR ROUGH WORK

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