

# CBCS SCHEME

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18MN651

## Sixth Semester B.E. Degree Examination, July/August 2022 Tunneling Engineering

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Define tunnel and explain the purpose of tunnel. (10 Marks)  
b. Discuss in detail the historical developments in tunneling. (10 Marks)

OR

- 2 a. Explain the controlling factors that determine the shape and size of tunnels. (10 Marks)  
b. Discuss in detail the site investigations to be carried out for a tunnel. (10 Marks)

### Module-2

- 3 a. Discuss the forepoling method of tunneling in soft ground with neat sketch. (10 Marks)  
b. Discuss in detail the drill and blast method of tunneling for hard rock. (10 Marks)

OR

- 4 a. List and explain the various problems encountered in tunneling. (10 Marks)  
b. Discuss in detail the cut and cover tunneling method with neat sketch. (10 Marks)

### Module-3

- 5 a. Explain the factors to be considered for drill selection during tunneling. (10 Marks)  
b. Explain the properties of explosives for tunneling. (10 Marks)

OR

- 6 a. Discuss the principle of fan cut method with neat sketch. (10 Marks)  
b. Discuss in detail the factors to be considered for tunneling accuracy. (10 Marks)

### Module-4

- 7 a. Explain in detail the opening of a tunnel using road header with neat sketch. (10 Marks)  
b. Explain the factors that influence the performance and productivity of roadheader. (10 Marks)

OR

- 8 a. Explain the working principle of tunnel boring machine, with neat sketch. (10 Marks)  
b. Explain the factors that influence the performance and productivity of tunnel boring machine. (10 Marks)

### Module-5

- 9 a. Discuss in detail the NATM of tunneling. (10 Marks)  
b. Discuss the principles of ground treatment for tunnel. (10 Marks)

OR

- 10 a. Explain the natural ventilation system in tunnel. (10 Marks)  
b. Explain the various hazards involved in tunneling. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg.  $42+8=50$ , will be treated as malpractice.