

CBCS SCHEME

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15MN661

Sixth Semester B.E. Degree Examination, Dec.2018/Jan.2019

Tunneling Engineering

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. What is the scope of tunnel engineering? Explain the parameters influencing location and shape of tunnel. (06 Marks)
- b. Define decline. A tunnel has to be driven inside the hill above the adjacent valley floor (or) coastal plain. Explain the best mode of entry along with neat sketch. (10 Marks)

OR

- 2 a. Define Aolit. Explain in detail the factors to be considered for underground excavations. (08 Marks)
- b. What are the applications of tunnel engineering? Explain the factor to be considered for underground excavation through shaft and tunnel. (08 Marks)

Module-2

- 3 a. What are the types and purpose of tunnels? Explain the factors affecting choice of excavation techniques of tunnels. (08 Marks)
- b. Explain fore pilling method in detail along with applications, sequence of operations, merits and demerits with neat sketch. (08 Marks)

OR

- 4 a. Explain English method of soft ground tunneling with applications sequence of operations, merits and demerits with neat sketch. (08 Marks)
- b. Explain cut and cover method of tunneling along with application, sequence of operations, merits and demerits. (08 Marks)

Module-3

- 5 a. What is the principle of drilling? Explain in detail factors affecting rock drillability. (08 Marks)
- b. Explain in detail fan cut and wedge cut patterns along with neat sketches. (08 Marks)

OR

- 6 a. Define powder factor. Explain the parameters influencing the blast performance? (08 Marks)
- b. What is the mechanism of blasting? Explain in detail the factors to be considered for marketing and transportation of equipment selection after blasting. (08 Marks)

Module-4

- 7 a. A SRP road way construction company has taken a context to construct a road from Mumbai to Mangalore. As a part of construction they come across a Hard rock in between. A tunnel has to be constructed in Hard rock. Considering the above case explain the parameters affecting the position of tunnel. (06 Marks)
- b. Explain in detail cutting principle, method of excavation, selection performance, limitations of road headers. (10 Marks)

OR

- 8 a. Explain in detail cutting principle, method of excavation selection performance, limitation of Tunnel Boring Machine (TBM). (10 Marks)
- b. Differentiate between TBM and Round Header. (06 Marks)

Module-5

- 9 a. What is NATM? Explain in detail principle types of supports and applicability of NATM. (08 Marks)
- b. What are the adverse ground conditions of tunneling and explain in detail how adverse ground condition effects on tunneling? (08 Marks)

OR

- 10 a. Explain in detail all the tunnel services that are to be adopted while constructing tunnel. (08 Marks)
- b. Define Hazard. Explain the tunneling hazards in detail. (08 Marks)
