

B TECH
(SEM VII) THEORY EXAMINATION 2017-18
TUNNEL ENGINEERING

*Time: 3 Hours**Total Marks: 100***Note:** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

- 1. Attempt all questions in brief. 10 x 2 = 20**
- a. Discuss the investigations made at the time of planning and construction of tunnels.
 - b. What is tunnel? Discuss the classification of tunnels on the basis of their alignment.
 - c. What are survey operations for a tunnel?
 - d. Discuss different types of locomotives. Explain any two.
 - e. Explain lightning and ventilation in tunnel.
 - f. Discuss about tunnel lining.
 - g. Write short note on "Safety precautions in tunneling".
 - h. What are the methods of hard rock tunnel? Explain any one.
 - i. Write short note on "Rock Bolting".
 - j. Differentiate between "Running Ground and "Soft Ground".

SECTION B

- 2. Attempt any three of the following: 10 x 3 = 30**
- a. Enlist various methods of tunneling in soft ground. Explain needle beam method.
 - b. Describe classification of tunnels. Sketch various shapes of tunnels and discuss their merits and demerits.
 - c. Why drainage is necessary in tunnels? Discuss various drainage systems for tunnels.
 - d. Describe with neat sketch the procedure to transfer the centre line inside the tunnel.
 - e. Discuss the following method of tunneling in farm ground:
 - (i) Full face method
 - (ii) Ring drilling method

SECTION C

- 3. Attempt any one part of the following: 10 x 1 =10**
- (a) State and explain the different methods adopted for controlling dust inhalation and also discuss equipment used for dust control.
 - (b) Explain Drift method of tunneling rock in brief.
- 4. Attempt any one part of the following: 10 x 1 = 10**
- (a) Explain in brief:
 - (i) Advantages of tunnels
 - (ii) Ideal alignment of Tunnels
 - (b) Explain Auger boring, micro tunneling and pipe jacking in detail.

- 5. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) What are locations where lighting arrangement to be made in tunnels. Also describe various lighting systems for tunnels.
 - (b) Discuss different types of Tunnels and explain shield method of tunnel construction in detail.
- 6. Attempt any *one* part of the following: **10 x 1= 10****
- (a) Explain the drill and blast method and also discuss various types of explosives used in tunneling.
 - (b) Enlist the different types of drilling equipments for the construction of tunnel. Explain any two types with neat sketches in detail.
- 7. Attempt any *one* part of the following: **10 x 1 = 10****
- (a) What are the psychological aspects of Tunnel safety? Explain risk analysis for road tunnels and what are the recommendations for the practical use of risk analysis.
 - (b) Explain the guidelines for the design of tunnels and also describe the general procedure in designing of tunnel.