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B.Tech.
(SEM- VII) ODD SEMESTER EXAMINATION, 2015-16
TUNNEL ENGINEERING

Time : 3 Hrs

Max Marks: 100

NOTE : ATTEMPT ALL QUEST

1. Attempt any **FOUR** Parts: **5x4=20**
 - (a) Name various shapes of tunnels and draw horse shoe section. Give main use of this section.
 - (b) What are advantageous and disadvantageous of tunnels? Classify the tunnels.
 - (c) Describe types of tests done for intact rocks use of test data.
 - (d) Explain RQD and RSR system of rock mass classification.
 - (e) How the centre line of tunnel is transferred from top to inside of tunnel.
 - (f) Discuss rock mass classification system and explain Q system and RQD system.

2. Attempt any **FOUR** Parts: **5x4=20**
 - (a) Discuss functional requirements of tunnels.
 - (b) What is a shaft? Give construction method for making a shaft in soft and hard rock.
 - (c) What are various types of drilling methods and equipments used in tunneling? Explain with sketch percussion drilling machines .
 - (d) What are various types of mountings for drill .when each type is used .
 - (e) Explain road headers .Differentiate between road header and TBM
 - (f) Describe basic functions of TBM

3. Attempt any **TWO** Parts: **10x2=20**
 - (a) What are steps in tunneling of hard rocks .Discuss Head & Bench method of tunneling .
 - (b) Explain the following
 - (i) Fore-poling method
 - (ii) New Austrian method
 - (iii) Grouting in soft ground tunneling
 - (iv) Types of explosives used in tunneling
 - (c) Discuss liner plate method in soft ground tunneling .Give sequence of operation .

4. Attempt any **TWO** Parts **10x2=20**
 - (a) What do you know by shield tunneling .Discuss various types of shield boring machines.
 - (b) What do you mean by trenchless technology? Give main areas in it. Also list methods of trenchless Installation.
 - (c) Write notes on:
 - (i) Pilot tube micro tunneling
 - (ii) Common modes of pipeline failure

5. Attempt any **Four** Parts **5x4=20**
 - (a) On what factors ventilation system depends .When natural ventilation is suitable?
 - (b) What are different systems in mechanical ventilation. Draw schematic diagram of combined system.
 - (c) How dust is controlled in tunnels? Discuss different types of lights used in tunnel works
 - (d) What are causes of accidents in tunnel , explain man made causes .Discuss preventive measures
 - (e) Write notes on fire safety in tunnels
 - (f) Discuss guidelines for design of ventilation pipes.