PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech., Summer 2017 - 18 Examination

Semester: 2   Date: 23/05/2018
Subject Code: 03215153   Time: 02:00 pm to 04:30 pm
Subject Name: Rock Openings and Tunnels   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Define 1) Competent Rock 2) Pillar 3) Laminated Rock 4) Areal Extraction Ratio & 5) Multiple Opening **(05)**

B) Explain Geological Rock mass classification **(05)**

C) What assumptions are made in designing Multiple openings **(05)**

Q.2 Answer the following questions. (Attempt any three) (Each five mark) **(15)**

A) Explain Advantages & Disadvantages of Using Drift Method for Tunneling

B) What are the objectives of Rock Mass Classification.

C) Explain Terzaghi's Rock mass classification

D) Explain heading and benching method for Tunneling.

Q.3 A) In a rectangular roof clamped on all edges, it was observed that the ratio of longer lateral dimension & shorter lateral dimension for Poisson's ratio = 0.3 is 1.5. The constant α was observed to be 0.24, the value of maximum deflection is 0.00185 m & maximum stress is 0.6 kg/cm^2. Assuming E = 0.9 x 10^4 kg/cm^2 & the ratio of 2 constants β & α = 3 Calculate the unit weight of rock. **(07)**

B) Write a Short Note on Tunnel Ventilation **(08)**

OR

B) Write the Advantages & limitations of using Tunnel Boring Machine **(08)**

Q.4 A) Explain different types of tunnels & classify them. **(07)**

OR

A) Explain with neat sketches the factors affecting compressive strength of pillars. **(07)**

B) The compressive strength of rib pillar is 1.66 times the compressive strength of rib pillar having W_P/H_P = 1. The pillar area & excavated area were recorded as 64 m^2 & 192 m^2 respectively in 3D array of openings having length to pillar width ratio = 1. Calculate 1) Effective Width of Pillar, 2) Height of Pillar & 3) Extraction Ratio **(08)**