Mid-West University

Examinations Management Office

End Semester Examinations 2081

Bachelor level/ B.E. Hydropower/ 6th Semester — Full Marks: 50

Time: 3 hours — Pass Marks: 25

Subject: Rock Mechanics and Tunneling (HE466/HE314)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. A tunnel of 10 m span is driven through slightly weathered granite with a dominant joint set dipping at 34° with the direction of the drive. Index testing and logging of diamond drilled core give typical Point-Load strength index values of 6 MPa and average RQD values of 80%. The slightly rough and slightly weathered joints with a separation of 0.5 mm are spaced at 800mm and the length of discontinuities are 1-3 m. The tunneling conditions are anticipated to be wet. Find the rock mass class based on given information. Also provide guidelines for excavation and support. **[5]**
2. What is discontinuity of rock mass? Classify different rock mass system and explain one of it. **[2+3]**
3. Describe different types and method of site investigation. **[4]**
4. What are the purpose of site investigation? How do you make site investigation of dam? **[2+2]**
5. What is slope stabilization? What are the factor that affects the slope stability? **[2+2]**
6. What is tunnel squeezing? Explain the process of NATM. **[1+4]**
7. Define the geological consideration and ground properties before constructing any tunnel project. **[5]**
8. Describe the various waves of earthquake. Differentiate between magnitude and intensity of earthquake. **[1+3]**
9. What is mass movement? Describe Verne's (1978) landslide classification. **[1+3]**
10. What is primary and secondary lining? What are the common materials for lining of bored tunnels? **[1+1+3]**
11. Write short notes on (***any two***). **[5]**
    a) Rock stress
    b) Tunnel support systems
    c) Mechanisms of failures of rocks

The End