Registration no:

Total Number of Pages: 02   **M TECH**
                                                                           SMPE205

2nd Semester Back Examination – 2016-17
ROCK MECHNICS
Branch: SOIL MECHANICS &FOUNDATION ENGG
Time: 3 Hours
Max Marks: 70
Q.CODE:Z847
Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.
Assume suitable data wherever necessary

Q1   **Answer the following questions:**   **(2 x 10)**
   a)   What is a lineated and foliated rock? Explain with example.
   b)   Classify the rocks according to degree of weathering.
   c)   Name the agents which cause metamorphism. Name a few metamorphic rocks.
   d)   What do you mean by 'core recovery'? How to classify the rock according to RQD?
   e)   Enumerate various field tests which are performed on rock deposits.
   f)   What do you mean by deformation modulus of a rock? Give its expression.
   g)   State the Maxwell model for rheological behavior of rock.
   h)   What do you mean by logging of core? Explain with neat sketch.
   i)   Why shear tests are required for a rock mass?
   j)   What do you mean by guniting?

Q2   What are various defects in rock mass? Explain the following defects with neat   **(10)**
           sketches;
              (i)   Fissures
              (ii) Folds
           Explain the importance of folds in engineering practice.

Q3 a) Discuss various methods of rock exploration.   **(5)**
        b) What do you mean by geophysical prospecting? Discuss the 'Magnetic Method'. **(5)**

Q4   **Discuss the following in-situ tests on rock;**   **(10)**
              (i)   Jacking test
              (ii) Deformability test
              (iii) Tensile strength test

Q5   How do you estimate the following physical properties of a rock? Explain in   **(10)**
           brief.
              (i)   Plasicity
              (ii) Poisson's ratio
              (iii) Degree of saturation
              (iv) Swelling
              (v)   Durability

Q6 a) What is creep of a rock? How do you estimate it? **(5)**
   If the creep rate (ψ) is given by the expression; $\Psi = 0.035\ e^{-0.63t}$, determine the amount of creep that will occur in a rock mass in its life time if the thickness of the rock is 600 cm.

   b) What are various rheological models for rock? Explain the Kelvin Model. **(5)**

Q7 a) Analyse the state of stress around boundary of an open flow. **(5)**

   b) What is rock bolting? Differentiate between rock bolting and grouting? Under what conditions are they preferred? Differentiate between rock bolting and rock reinforcing. **(5)**

Q8   **Write brief notes on any FIVE of the following** **(5 x 2)**
   a) Failure in rock
   b) Strength criteria of a jointed rock
   c) Punch shear test
   d) Foundation on rocks
   e) Bituminous grouting
   f) Burger model
   g) Plutonic rocks
   h) Resonance method