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Roll No .....

MI-701 (GS)

B.E. VII Semester Examination, June 2020

Grading System (GS)

Rock Mechanics

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. What are Rheological models? How are they useful in rock mechanics? Explain also Burger model.

2. Explain :
   i) Principal plane
   ii) Principal stress
   iii) Residual stress
   iv) Induced stress

3. i) A cylindrical specimen of moist clay has a diameter of 38mm, height of 76mm and mass of 174.2 grams. After drying in the oven at 105°C for about 24 hours, the mass is reduced to 148.4 grams. Find the dry density, bulk density and water content of the clay.

   Assuming the specific gravity of the sample grains as 2.71. Find the degree of saturation.

   ii) A typical hard rock with E = 100×10^3 MPa and Poisson's ratio, $v = 0.25$. What will be the modulus of rigidity.

4. A sample while testing has the following description

   Dry mass - 80 g

   Bulk mass - 86 g

   Saturated mass - 96 g

   Volume of the sample - 35 cc.

   Find the porosity moisture content and degree of saturation of the sample.

5. Describe the procedure for conducting triaxial compressive strength test on rock sample and its result interpretation.

6. What is the importance of insitu stress measurement? Explain any hydraulic fracturing method of insitu stress measurement.

7. Compare between plastic and viscous behaviour of rock materials by drawing stress Vs strain and strain Vs time diagram.

OR

Compare Maxwell model with St. Venant model.

8. Answer any two of the following:
   a) Write notes on Q system.
   b) How size and shape of sample affects the strength of rock sample?
   c) How shear failure differs from flexural failure?
   d) Explain how water affects the strength of rock?

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