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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: CE205

Course Name: ENGINEERING GEOLOGY (CE)

Max. Marks: 100 Duration: 3 Hours

Draw figures wherever necessary

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) Evaluate the porosity and permeability factors of intact rock and rock masses. (3)

b) Permeability alone cannot be used to judge the flow of ground water. Discuss. (4)

c) How long does it take for water subjected to 10m head difference to pass through a 5m length of (2.5)

1. intact granite which has an isotropic hydraulic conductivity (K) of 1×10^{-12} m/s (2.5)
2. fractured sandstone with an isotropic hydraulic conductivity (K) of 1×10^{-4} m/s

d) From the above two results of time factor of water flow, which among those rocks need care while accomplishing engineering projects affecting subsurface. (3)

2 a) Discuss the significance of O and E horizons of soil profile. (7)

b) Examine the role of acids in chemical weathering. (8)

3 Compare the effectiveness of barriers and liners to control subsurface water in construction sites. (15)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Chemical composition alone is insufficient to name a mineral, Discuss. (3)

b) Write a short description on any two properties that are used to identify a mineral species during field work phase. (7)

c) Why colour and streak of minerals are not always identical? (2)

d) Quartz occur less than 10% in majority of crustal rocks. But they form more than 60% of sand deposition on earth surface. Why? (3)

5 a) Discuss (5)

i) Granite ii) Basalt

b) How do sedimentary rocks differ from metamorphic rocks? (5)

c) Discuss any two major rock species outcropped in the state of Kerala. (5)

6 a) Are the properties (related to strength) desirable for building stones and road aggregates, similar? Evaluate. (7)

b) Discuss the disadvantages of intensity as a measure of earthquake strength. (8)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Discuss the origin of folding and faulting of rocks (5)

b) Briefly discuss why the knowledge on rock joints is important for the construction of engineering structures. (5)

c) How do the trends of geological structures decide the location of huge civilian constructions like dam and reservoirs? (5)

d) . Identity the category to which the fold having following geometry falls into (5)

Strike of limb 1 – N60 degrees; Dip of limb 1 – 20 degrees to N 330

Strike of limb 2 – N 240 degrees; Dip of limb 2 – 20 degrees to N 330

And draw a cross section of the fold along the limbs

8 a) Assess beach nourishment and relocation of engineering structures as alternatives to hard methods of coastal protection. (10)

b) Evaluate the negative effects of seawalls and groins as shore protection structures. (10)

9 a) Appraise the benefits of crop rotation and strip farming as soil conservation strategies. (10)

b) Mass wasting is a tug of war between gravity and friction. Judge this statement in terms of gravity and shear strength of earth materials. (10)

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