

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

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|---|----|---|-------|
| 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.

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|---|----|--|-----|
| 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.

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| 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)
