

Reg. No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

CE205: ENGINEERING GEOLOGY (CE)

Max. Marks:100

Duration: 3 Hours

Draw neat sketches wherever necessary

Part A

(Answer any TWO questions)

- 1) Explain:
 - a) chemical weathering (7.5)
 - b) soil profile (7.5)
- 2) Describe vertical distribution of ground water (15)
- 3) What are:
 - a) exfoliation (4)
 - c) artesian wells (4)
 - d) Give an account of factors controlling groundwater movement (7)

Part B

(Answer any TWO questions)

- 4) Explain:
 - a) cleavage (5)
 - b) lineation and foliation (5)
 - c) chemical formulae of calcite and quartz (2.5x2= 5)
- 5) Discuss seismic waves and their properties (15)
- 6) Elucidate
 - a) Classification of rocks based on their origin (6)
 - b) Lithosphere and Asthenosphere (5)
 - c) Point load test (4)

Part C

(Answer any TWO questions)

- 7) Explain:
 - a) Folds (7)
 - b) faults (7)
 - c) their significance in civil engineering (6)
- 8) Discuss the different flood management strategies (20)
- 9) Elucidate on:
 - a) Longshore currents (7)Engineering significance of:
 - a) Dip and (7)
 - b) strike (6)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: **CE 205**Course Name: **ENGINEERING GEOLOGY (CE)**

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any 2 questions.

1. a) What is weathering? (2)
b) Describe the types of weathering and their products. (13)
2. a) Describe the laboratory tests to assess the intensity of weathering. (8)
b) Discuss the geological classification of soils. (7)
3. a) Write notes on different ground water zones. (7)
b) What is an aquifer? Describe the types of aquifers. (8)

PART B

Answer any 2 questions.

4. Write the distinguishing properties with the chemical composition of the following minerals.
a. a) Orthoclase b) Hornblende c) Kaolinite (5 marks each)
5. How do one differentiate Igneous rocks from Metamorphic rocks (15)
6. a) What is an earthquake? (2)
b) Describe the terms: intensity and magnitude of earthquakes. (8)
c) Write a note on plate tectonics. (5)

PART C

Answer any 2 questions.

7. Explain
a) Rip currents. (7)
b) Joints. (7)
c) Write on the significance of faults in civil engineering. (6)
8. What are the geological factors to be considered in Dam construction? (20)
9. a) Classify landslides (7)
b) Describe various methods used to protect the coastal areas from marine erosion. (7)
c) Write a note on soil conservation measures. (6)

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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) |

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- 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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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: CE205

Course Name: ENGINEERING GEOLOGY (CE)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks

Marks

- | | | | |
|---|----|--|-----|
| 1 | a) | What is weathering? Explain different types of weathering. | (6) |
| | b) | Explain any two laboratory tests used for assessing intensity of weathering. | (6) |
| | c) | Explain soil profile with neat sketch. | (3) |
| 2 | a) | Explain Artesian aquifer | (3) |
| | b) | Explain Hydraulic conductivity | (3) |
| | c) | Describe the methods to control of subsurface water. | (9) |
| 3 | a) | List the various sub-divisions in geology | (5) |
| | b) | Differentiate unconfined and confined aquifer with figure. | (5) |
| | c) | Elucidate on geological classification of soil | (5) |

PART B

Answer any two full questions, each carries 15 marks

- | | | | |
|---|----|--|------|
| 4 | | Explain physical properties of the following:
i) Amphibole ii) Pyroxene iii) Mica | (15) |
| 5 | a) | Explain the concept of lineation and foliation. | (5) |
| | b) | Write short note on rock types of Kerala. | (5) |
| | c) | Differentiate igneous, sedimentary and metamorphic rocks. | (5) |
| 6 | a) | Explain the properties that affect the strength of minerals | (6) |
| | b) | Write short note on
i) Granite ii) Shale iii) Lime-stone | (9) |

PART C

Answer any two full questions, each carries 20 marks

- | | | | |
|---|----|---|------|
| 7 | a) | What is meant by folds? Explain different types of fold. | (6) |
| | b) | Describe the classification of fault. | (6) |
| | c) | Describe geological factors considered in the construction of dams and tunnels. | (8) |
| 8 | a) | Explain Flood and its causes. | (6) |
| | b) | Discuss the various flood control measures | (6) |
| | c) | Explain soil erosion and its causes. | (8) |
| 9 | a) | Give the engineering significance of faults and joints. | (12) |
| | b) | What are the different soil conservation measures employed? | (8) |

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: CE205

Course Name: ENGINEERING GEOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- | | | |
|---|---|------|
| 1 | a) Give brief account of relevance of Geology in civil engineering. | (5) |
| | b) Describe different types of weathering and its engineering significance. | (10) |
| 2 | a) Describe the common methods to control subsurface water | (5) |
| | b) Explain (i) Hydraulic conductivity (ii) Artesian condition | (10) |
| 3 | a) Explain the classification of weathered rock mass. | (5) |
| | b) Explain how ground water can pose problems during the construction of tunnels. | (10) |

PART B

Answer any two full questions, each carries 15 marks.

- | | | |
|---|--|------|
| 4 | a) Describe any three physical properties which affect the strength of minerals. | (6) |
| | b) Explain: (i) Quartz (ii) Feldspar (iii) Gypsum | (9) |
| 5 | a) Give brief account of rock features that affect the strength of rock as construction material | (6) |
| | b) How are igneous and sedimentary rocks differentiated in field (site)? Add a note on their outcrops in Kerala. | (9) |
| 6 | a) Compared to Himalayan region earthquakes are less frequent in Kerala -
Elucidate | (5) |
| | b) Write short notes on: (i) Granite (ii) Shale | (10) |

PART C

Answer any two full questions, each carries 20 marks.

- | | | |
|---|--|------|
| 7 | a) What is meant by folds? Explain three different types of fold. | (7) |
| | b) Describe geological factors considered in the construction of tunnels; Add a note on overbreak in tunnel. | (10) |
| | c) What are contours? Draw a contour pattern (not on scale) representing a 60m high volcanic cone, with a dry crater of 25m deep, located along sea shore (use contour interval – 20m) | (3) |

- 8 a) What are the damaging coastal processes? What are the coastal protection strategies? (10)
- b) Describe different soil conservation measures (10)
- 9 a) How Joints are formed? How do joints differ from fault? (8)
- b) What are the causes of landslides? Add a note on their preventive measures. (8)
- c) The dip amount and dip direction of two outcrop of a contact between limestone and sandstone, located at a distance of 500m apart, are $20^{\circ}/N150^{\circ}$ and $21^{\circ}/N330^{\circ}$. Identify the structure and its strike. (4)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: CE205

Course Name: ENGINEERING GEOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

- | | | Marks |
|---|---|-------|
| 1 | a) Define weathering of rocks. Explain the weathering by mechanical means. | (7) |
| | b) Describe any two laboratory test used for assessing intensity of weathering. | (4) |
| | c) Sketch the typical soil profile with a short description of each zone. | (4) |
| 2 | a) Define aquifer. Discuss the classification of aquifers. | (5) |
| | b) Relate porosity and permeability in aquifers. | (5) |
| | c) Explain any three methods to control sub-surface water during the constructions. | (5) |
| 3 | a) Elucidate any three geological classes of soils | (9) |
| | b) Explain the relevance of geology in construction engineering. | (6) |

PART B

Answer any two full questions, each carries 15 marks.

- | | | |
|---|---|-----|
| 4 | a) Describe any three physical properties which affect the strength of minerals. | (6) |
| | b) Explain: (i) Calcite (ii) Biotite (iii) Gypsum | (9) |
| 5 | a) Give an account of any two rock features that affect the strength of rock as foundation material | (6) |
| | b) Discuss the origin of igneous rocks and sedimentary rocks | (9) |
| 6 | a) How do earthquake waves help to understand the interior structure of earth? | (6) |
| | b) Write short notes on: (i) Basalt (ii) Marble | (9) |

PART C

Answer any two full questions, each carries 20 marks.

- | | | |
|---|---|-----|
| 7 | a) Explain strike and dip with figures | (6) |
| | b) Describe any two geological factors considered essential in the construction of tunnels | (8) |
| | c) How are folds formed in rock? Discuss the significance of fold in selecting feasible sites for dam. | (6) |
| 8 | a) The dip amount and dip direction of two outcrop of a contact between limestone and sandstone, located at a distance of 500m apart, are 20° /N150 ^o and | (5) |

21⁰/N330⁰. Identify the structure and its strike.

- b) What are contours? Draw a contour pattern (not on scale) representing a 60m high volcanic cone, with a dry crater of 25m deep, located along sea shore (use contour interval – 20m) (3)
- c) List the causes of soil erosion (12)
- 9 a) What are faults? Describe the parts of a fault with diagram. How do faults differ from joints (10)
- b) Describe any three types of mass wasting. (6)
- c) Discuss the causes of landslides in Kerala (4)

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
THIRD SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: CE205

Course Name: ENGINEERING GEOLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

- | | Marks |
|---|-------|
| 1 a) Write a note on the relevance of geology in civil engineering | (10) |
| b) Discuss the engineering significance of weathering | (5) |
| 2 a) Elucidate on the engineering classification of weathered rock masses | (8) |
| b) Evaluate the porosity and permeability of rocks | (7) |
| 3 a) Discuss the ground water flow equation using Darcy's law | (6) |
| b) Elucidate the problems created by subsurface water in construction sites | (9) |

PART B

Answer any two full questions, each carries 15 marks.

- | | |
|---|------|
| 4 a) Write short notes on
Shale | (5) |
| b) Marble | (5) |
| c) Quartzite | (5) |
| 5 a) Discuss about the seismic discontinuities inside the earth | (7) |
| b) Elucidate on the role of seismic waves in the study of internal structure of earth | (8) |
| 6 a) Explain hardness of minerals | (5) |
| b) Discuss any five rocks of Kerala | (10) |

PART C

Answer any two full questions, each carries 20 marks.

- | | |
|---|-----|
| 7 a) Describe the attitude of geological structures | (6) |
| b) Discuss any two types of faults in rocks | (7) |

- c) Examine the role of slope and water in the occurrence of landslides (7)
- 8 a) Discuss the geological factors to be considered in the selection of reservoir site (12)
- b) The dip amount and dip direction of two outcrop of a contact between limestone and sandstone, located at a distance of 500m apart, are 20° /N150⁰ and 21° /N330⁰. Identify the structure and its strike. (5)
- c) What are contours? Draw a contour pattern (not on scale) representing a 60m high volcanic cone, with a dry crater of 25m deep, located along sea shore (use contour interval – 20m) (3)
- 9 a) What are the landforms produced by marine erosion and deposition (8)
- b) Examine the methods to prevent landslides (5)
- c) Discuss the various flood management strategies (7)

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Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third semester B.Tech examinations (S) September 2020

Course Code: CE205**Course Name: ENGINEERING GEOLOGY**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any two full questions, each carries 15 marks.*

Marks

- | | | |
|---|---|-----|
| 1 | a) What is weathering? | (3) |
| | b) Discuss Dearman classification of weathering. | (4) |
| | c) Describe different types of weathering and their products. | (8) |
| 2 | a) What is an aquifer? | (8) |
| | b) Discuss different sources of ground water. | (3) |
| | c) With the help of a figure differentiate various types of aquifers encountered in earth. | (9) |
| 3 | a) The sandstone recovered from Dharmadam island, Kannur has bulk volume of 145m^3 and estimated to have a pore space volume of 27.76m^3 . Calculate the porosity of the sandstone. | (5) |
| | b) Explain the relevance of weathering in construction engineering | (4) |
| | c) Using a profile picture, discuss characteristics of soil in different soil horizons. | (6) |

PART B*Answer any two full questions, each carries 15 marks.*

- | | | |
|---|---|-----|
| 4 | a) Discuss Mohr scale of hardness. | (5) |
| | b) Define mineral calcite. How are they identified in the field? Discuss the importance of calcite in construction engineering. | (6) |
| | c) Discuss the mineral properties that affect its strength. | (4) |
| 5 | a) What are basalts? How do basalts differ from granites? | (5) |
| | b) Metamorphic rocks and sedimentary rocks cover larger part of Kerala compared to igneous rocks. Evaluate the statement with respect to their geographic spread. | (5) |
| | c) Discuss seismic waves? How do body waves differ from surface waves? | (5) |
| 6 | a) Briefly explain the concept of plate tectonics. | (5) |
| | b) Compare and contrast feldspar and quartz. | (4) |

- c) Discuss engineering properties of rocks. (6)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) With neat diagram, describe folding in rocks. Write a note on the significance of rock folding in engineering designs. (8)
- b) What are rock joints? How do they differ from geological faults? (7)
- c) Calculate the true dip directions to a shale- coarse sandstone contact with strike N130°. (5)
- 8 a) What are contours? Draw a contour diagram representing 60m deep basinal depression within a plateau land located at 120m height from msl. Note that, the basin has a mound of 40m height at its center. (9)
- b) What are landslides? Discuss the role human beings in accelerating landslides. (6)
- c) Discuss how structural contours help to deduce the subsurface structure of rock sequences. (5)
- 9 a) Discuss different engineering methods adopted to conserve river bank and flood plain from frequent flood. (10)
- b) Discuss various coastal landforms and their strategies to protect them from erosion. (10)
