Roll No. .....

3206

B. Tech. (Civil Engg.) 5th Semester Examination – February, 2022

ENGINEERING GEOLOGY

Paper : PCC-CE-311-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any ***five*** questions. Question No. **1** is ***compulsory***. Attempt ***one*** question from each Unit. All questions carry equal marks.

1. Answer the following questions : $1.5 \times 10 = 15$

(a) Define the term soil profile

(b) Describe briefly the anticline and syncline.

(c) Define weathering.

(d) What is meant by seismic zone?

(e) Explain in short the term stratigraphy.

(f) Explain in detail about chemical weathering.

(g) Describe the term landslide.

(h) Write about ripple marks.

(i) Explain about dip faults.

(j) Write short note on exfoliation and exudation.

UNIT – I

2. (a) Discuss the role of Engineering Geology in Civil Engineering projects. 10

(b) Explain with neat sketch the interior of the earth. 5

3. Explain with neat sketches major geological features produced by water on earth surface. 15

UNIT – II

4. Give an account of different types of rocks among igneous, sedimentary and metamorphic groups which occur more frequently and abundantly in nature. 15

5. Write short notes on the following with sketches : $3 \times 5 = 15$

(a) Fan Fold

(b) Columnar joints

(c) Angular unconformity

(d) Radial faults

(e) Reverse fault

UNIT – III

6. (a) Draw and explain types of aquifers. 7

   (b) Explain methods of artificial recharge of groundwater. 8

7. Write a short note on uses of geological maps and interpretation of data, geological reports during Geological investigation. 15

UNIT – IV

8. (a) Explain briefly geological conditions influence on design of dams. 10

   (b) What do you understand by term hill-slope stability ? 5

9. Discuss the causes, classification and preventions of landslides. 15

Roll No. .....

3203

B. Tech. (Civil Engg.) 5th Semester Examination – February, 2022

SOIL MECHANICS

Paper : PCC-CE-305-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in all, selecting at least ***one*** question from each unit. Question no. 1 is ***compulsory***. All questions carry equal marks.

1. Answer the following questions : $1.5 \times 10 = 15$

(a) Define Consistency index.

(b) Write the assumptions taken in Darcy's Law.

(c) Define Atterberg's limits.

(d) Write effective stress equation for downward flow condition.

(e) Derive relationship between void ratio and porosity.

(f) Write down Boussinesq's equation.

(g) What do you mean by earth pressure at rest ?

(h) Define shear strength of soil.

(i) Draw void ratio-stress relationship curve for sand.

(j) Differentiate between primary and secondary consolidation

UNIT – I

2. (a) For a soil in its natural state, void ratio, water content and specific gravity are respectively 0.8, 24% and 2.68. Determine bulk density, dry density and degree of saturation. If the soil is completely saturated by adding water, what would be its water content and saturated density. 10

(b) Explain different method of compaction. 5

3. (a) Discuss Indian standard classification system. 7

(b) What are the various methods for determination of permeability of soil ? 8

UNIT – II

4. (a) What is quick sand condition ? Calculate hydraulic gradient for this case. 5

(b) In a soil deposit layer is 10m thick having water table at 5m below the ground surface. There is a capillary zone of 1.5m with degree of saturation 80%. Void ratio is 0.6 and specific gravity s 2.65. Assume soil above the capillary zone to be dry. Draw total, effective and pore pressure distribution 10

5. (a) Explain the factors affecting rate of compaction of a soil mass. 7

(b) Differentiate between standard and modified compaction test method. 8

UNIT – III

6. (a) Draw and explain vertical stress distribution diagram below a line load. 7

(b) A water tank is supported by a ring foundation having outer diameter of 10m and inner diameter of 7.5 m. the ring foundation transmits uniform load intensity of 160 KN/m^2. Compute the vertical stress at a depth of 4 m at the centre using Boussinesq analysis. 8

7. (a) Define overconsolidated state of a clay strata. Discuss its practical significance. 7

(b) Explain procedure to determine preconsolidated stress using graphical method. 8

UNIT – IV

8. (a) Explain briefly Direct shear test of soil. 5

(b) An unconfined compression test was conducted on an undisturbed clay sample. The sample had a diameter of 32 mm and length 66 mm. the load at failure was 30 N and axial compression of the sample was 10 mm. determine the undrained shear strength parameters if the failure plane makes an angle 46° with horizontal 10

9. (a) Derive expression for active and passive earth pressure using Rankine's theory 7

(b) What do you mean by the critical depth of vertical depth for a clay soil. 8
