GEOL300 **Student's Copy**

2025

(NEP—2020)

(5th Semester)

GEOLOGY (MAJOR1)

(Engineering Geology, Remote Sensing and GIS)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(*Marks* : 10)

Tick (✓) the correct answer in the brackets provided : 1×10=10

1. In arch dam the resultant force due to impounded water is transferred to the

(a) foundation rocks ( ) *(b)* heel of the dam ( )

(c) toe of the dam ( ) *(d)* abutment rocks ( )

2. Porosity (P) of a rock is determined as

(a) $P \quad W_2 \quad W_1 / V \quad 100$ ( ) *(b)* $P \quad W_1 \quad W_2 / m \quad 100$ ( )

(c) $P \quad W_2 \quad W_1 / m$ ( ) *(d)* $P \quad W_2 \quad W_1 / V$ ( )

3. The Brazilian test is commonly used for testing the

(a) tensile strength ( ) *(b)* binding properties ( )

(c) modulus of elasticity ( ) *(d)* hardness ( )

4. If you travel north direction from survey of India toposheet no. 84F/1, which toposheet will you encounter?

(a) 84A/2 ( ) *(b)* 84E/2 ( )

(c) 84E/4 ( ) *(d)* 84F/2 ( )

5. In a very low gradient slope, contour lines

(a) intersect ( )

(b) are closely spaced ( )

(c) bend upwards in V-shape ( )

(d) are widely spaced ( )

6. An instrument for establishing the line of sight in a plane table is

(a) alidade ( ) *(b)* compass ( )

(c) spirit level ( ) *(d)* U-fork ( )

7. Remote sensing techniques make use of the properties of

(a) magnetic waves ( ) *(b)* sound waves ( )

(c) electric waves ( ) *(d)* electromagnetic waves ( )

8. Which part of the electromagnetic spectrum is most commonly used in optical remote sensing?

(a) Gamma rays ( )

(b) Visible and near-infrared ( )

(c) X-rays ( )

(d) Radio waves ( )

9. What is the primary function of a GIS?

(a) To create detailed drawings for buildings and road networks ( )

(b) To manage, analyze and visualize spatial data ( )

(c) To store large datasets ( )

(d) To conduct statistical analysis ( )

10. Which of the following GIS softwares is an open source?

(a) QGIS ( ) *(b)* ArcGIS ( )

(c) ERDAS ( ) *(d)* Pix4D ( )

(SECTION : B—SHORT ANSWERS)

(*Marks* : 25)

Describe briefly *five* of the following, taking at least *one* from each Unit : 5×5=25

UNIT—I

1. Soil classification based on texture

2. Types of dams

UNIT—II

3. Map scale

4. Geodetic surveying

UNIT—III

5. Continuous Wave (CW) Radar

6. LANDSAT

UNIT—IV

7. Topology model

8. Vector and raster data

(SECTION : C—DESCRIPTIVE)

(*Marks* : 40)

Answer *four* questions, taking *one* from each Unit : 10×4=40

UNIT—I

1. Describe in detail the geological considerations for construction of tunnels. 10

2. Give accounts on the following : 5+5=10

(a) Rock strength

(b) Atterberg limit

UNIT—II

3. Describe in detail the method of traversing and triangulation in survey with suitable illustrations. 10

4. Write notes on the following : 5+5=10

(a) Plane table

(b) Significance of contours

UNIT—III

5. Define remote sensing. Add notes on remote sensing platforms and sensors. 2+4+4=10

6. Write notes on the following : 5+5=10

(a) IRS

(b) SPOT

UNIT—IV

7. Define GIS and discuss its applications in geology. 2+8=10

8. Write notes on the following : 5+5=10

(a) Digital elevation model (DEM)

(b) Hardware and software components of GIS

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