B.Sc. Geological Sciences Examination, 2025

(1st Year, 1st Semester)

Principles And Application Of Field Instruments

Paper : SEC/11/101

Time : *Two Hours* *Full Marks* : 40

Use separate answer scripts for each part.

PART—I (20 Marks)

1. Answer *any* **four (4)** questions : 5×4=20

(a) How do you get the Toposheet Number? What is the procedure by which you can locate yourself in your studied map? 2.5+2.5=5 **(CO2)**

(b) Describe briefly about the basic components of a Clinometer Compass. 5 **(CO1)**

(c) How is a Diagonal Scale constructed? Explain the basic principle. How do you measure the attitude of an inclined plane? 2.5×2=5 **(CO2)**

(d) Describe briefly a Barometric Altimeter with a schematic diagram. What is the atmospheric pressure of Mean Sea Level (MSL)? 4+1=5 **(CO1)**

(e) How do you measure the 'Front Bearing' and 'Back Bearing' using clinometer compass? What do you understand by 'scale of Toposheet'? 3+2=5 **(CO2)**

(f) Describe the operation of a digital clinometer with a schematic diagram. Describe the applications of a digital clinometer. 3.5+1.5=5 **(CO1)**

PART—II (20 Marks)

Answer *any* **four** question from the following : 5×4=20

1. What are the different types of positioning generally being used during a geological field work? Which positioning system is the most suitable and accurate one? Mention the situations when this accurate system may not work properly. **[CO1]** (2+1+2)

2. What are the series of actions you need to perform in proper sequence after reaching a location/exposure of interest during your field work? Why in most of the geological photographs a common item of known dimensions is normally placed? — Explain in brief. **[CO2]** (3+2)

3. A rectangular geological map of almost flat terrain has a length and width of 4 feet by 2.5 feet, respectively. The scale of the map given is 1 cm = 1 km. Estimate the actual area of the map given.

V. Reconnaissance survey in the field study area to be done is **[CO2]**

(a) long before the actual field work to be done

(b) some days prior from the actual fieldwork to be done

(c) at the starting day after reaching the study area for the fieldwork

(d) in between the two successive fieldworks of a particular study area

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Now, in this map there is a prominent exposure of basalt just at the center point of the map. If your field camp is located exactly 4 km apart from that exposure towards 135°, draw the line of your traverse you need to walk to come back at the camp from that exposure of basalt. **[CO1]** (2+3)

4. What is meant by the term intensity of a natural hazards? What are the common natural hazards a geologist may encounter during filed work? Discuss in brief. How does rock-fall differ from rock-slide? **[CO2]** (1+2+1)

5. Select the correct answer for the following questions from the given options : (1×5)

(*For MCQ - write the full question first, then mention your option with its full text*)

I. Which of the following natural hazards is not common, if the area of field study is in high altitude hilly region? **[CO2]**

(a) Falling Rocks

(b) Lahar

(c) Snow avalanche

(d) Rising tides

II. Number of active GPS satellites rotating around the Earth is

(a) 12

(b) 24

(c) 36

(d) 4

III. Considering a proper geological field work, which sequence of actions is not correct? **[CO1]**

(a) Data analysis - Data Interpretation – Preparation of report

(b) Plan and choose the study area - Prepare the necessary equipment - Conduct Reconnaissance

(c) Understanding the Geology and relevant information of the area from existing reports - Go to the filed for data collection - Data analysis

(d) Conduct Reconnaissance – Review the existing reports - Go to the field for data collection

IV. Suppose, during a field work you are proceeding to a direction of 257° according to your clinometer compass reading. Then you are grossly moving towards the geographical direction of **[CO2]**

(a) NSW

(b) NNW

(c) SSW

(d) WSW