BACHELOR OF SCIENCE EXAMINATION, 2024

(1st Year, 1st Semester)

GEOLOGICAL SCIENCE

PAPER : SEC–11/101

(Principles and Applications of Field Instruments)

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

(PART—I / 20 Marks)

Use separate answer scripts for each part.

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

(a) What is a contour line? How to you know the toposheet number of a location? How do you orient the topographical map during fieldwork? 1+2+2=5

(b) How do you measure the strike, dip and dip direction of an inclined plane with the help of clinometer compass? Why is east-west direction reversely printed on the dial of a clinometer? 3+2=5

(c) Write short notes on (*any* **two**) : 2.5×2=5

(i) Diagonal Scale

(ii) Digital Clinometer

(iii) GPR

(d) Describe a Barometric Altimeter with a schematic diagram.

Diagram showing the face of the "three-pointer" sensitive aircraft altimeter displaying an altitude. Calculate the altitude of the aircraft. 4+1=5

(e) How do you differentiate the disposition of sill and dyke with respect to contour lines on a topographic map? Explain with a suitable sketch. What do you understand by "Front Bearing" and "Back Bearing"? 3+2=5

4. What are the indirect methods of locating yourself with respect to the topographic map of your field working area?

Suppose, during a field work in an extremely remote place, you are following 'stepping method' to track your field location and to do that, from a known location (A) in your map first you proceed towards 290° by a walk count of 2100 steps, from there you move forward towards 65° by 1800 steps and finally from there again you proceed towards 130° by 1500 steps to reach the required rock exposure (B). If you are walking a distance of 2 meter by your 6 stepping and the scale of the map is 1cm = 100m. Draw the track line of your walking direction from A to B according to the given scale of the map. 1+4=5

5. What are the standard volume of rock samples and weight of loose earthy materials, needed to be collected during geological field work for further analysis? What are the advantages of drilled rock samples over normally hammered rock samples? What type of drill machine is generally used to collect the samples from harder rocks? 2+2+1=5

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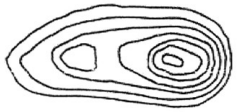
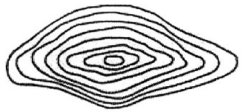
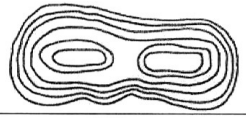
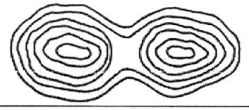
(f) Describe the functions of bridge of a clinometer compass.

Match the Contour lines to the Topographic profiles shown below. 2+3=5

Contours		Topographic Profiles	
1		A	
2		B	
3		C	
4		D	
5		E	
6		F	

PART—II

(Full Marks – 20)

Answer ***any* four** questions : 5×4=20

1. What are the major objectives of a Geological field work? Mention the possible data formats of geological field study. How does the primary data differ from the secondary data? 2+2+1=5

2. Why we use GPS during geological field work? At present how many active GPS satellites are there in space? Minimum how many satellite signals are required to record the accurate data from GPS? — explain with proper diagram. 2+1+2=5

3. What is the significance of closed topographic contours? Draw the tentative two dimensional outcrop patterns along the dotted intersecting line of the contour orientations as given below, for A & B separately. For both A & B the magnitude of contours decreases inward from the outer periphery. 1+4=5