Total No. of Printed Pages—11

1 SEM TDC GEGL (CBCS) GE 1 (A/B/C)

2024

(November)

GEOLOGY

(Generic Elective)

Paper : GE–1

Full Marks : 53
Pass Marks : 21

Time : 3 hours

The figures in the margin indicate full marks for the questions

Paper : GE–1(A)

(INTRODUCTION TO GEOLOGY)

Unit—I

(Solar System and Earth)

(*Marks* : 9)

1. Fill in the blanks : 1+1=2

(a) The most abundant light element present in the core is _____.

(b) The rotational direction of planets _____ and _____ is opposite to the rotational direction of all other planets.

2. Write a note on the magnetic field of the earth. 3

3. Describe the different discontinuity surfaces separating the different layers of the earth's internal structure with neat sketches. 4

Unit—II

(Principles of Geology)

(*Marks* : 7)

4. Answer as directed : 1+1=2

(a) The theory of uniformitarianism was first proposed by _____.

(Fill in the blank)

(b) Name one ultrabasic rock.

5. Answer any *one* of the following : 5

(a) What is rock-forming mineral? Write on igneous, sedimentary and metamorphic rocks with examples.

(b) What do you mean by rock cycle? Describe briefly.

Unit—III

(Earth's Exogenic Processes)

(*Marks* : 10)

6. Fill in the blank : 1

When thin shells of rocks get detached from the main mass layer-by-layer is called _____ weathering.

7. What do you mean by weathering? Describe the different types of weathering and their end products. 6

Or

What is soil profile? Describe the classification of soil profile. 2+4=6

8. Write a short note on any *one* of the following : 3

(a) Sand dunes

(b) Sea waves

Unit—IV

(Earth's Dynamic and Endogenic Processes)

(*Marks* : 9)

9. Fill in the blanks : 1+1=2

(a) Transform fault occurs in _____ plate boundaries.

(b) The magnitude of earthquake is measured in _____ scale.

10. Write short notes on any *two* of the following : $3\frac{1}{2}\times2=7$

(a) Types of plate boundaries

(b) Seafloor spreading

(c) Types of mountains

Unit—V

(Genesis of Rock)

(*Marks* : 9)

11. What do you mean by lava and magma? Write a note on the physical and chemical properties of magma. 2+4=6

Or

What is a volcano? Describe the different types of volcano with examples. 1+5=6

12. Define the following (any *two*) : $1\frac{1}{2}\times2=3$

(a) Metamorphism

(b) Lithification

(c) Metasomatism

(Continued)

Unit—VI

(Introduction to Palaeontology)

(*Marks* : 9)

13. What do you mean by fossil? Write the different modes of preservation of fossil. 1+5=6

Or

Discuss in detail the applications of fossils in geological sciences. 6

14. Write a short note on any *one* of the following : 3

(a) Palaeozoology and Palaeobotany

(b) Micropalaeontology

Paper : GE–1(B)

(Rocks and Minerals)

Unit—I

(*Marks* : 8)

1. *(a)* What is a mineral? What are the factors that control the physical properties of mineral? 1+2=3

(b) Describe five important physical properties of mineral with examples. 5

Unit—II

(*Marks* : 9)

2. *(a)* What are the elements of a crystal which are used to observe the symmetry? 3

(b) How are atomic structure, physical properties and optical properties related to each other? 3

(c) What do you mean by interfacial angle and axial ratio of a crystal? 3

Unit—III

(*Marks* : 9)

3. Answer any *three* of the following : 3×3=9

(a) Define ordinary light and polarized light.

(b) Define optical axis. Explain with figures.

(c) Draw a sketch of the simple petrological microscope.

(d) What is biomineralization?

Unit—IV

(*Marks* : 27)

4. Describe the rock cycle with neat sketches. 7

5. Answer any *four* of the following : 5×4=20

(a) Describe the different textures of igneous rocks with neat sketches.

(b) Write briefly the different processes of formation of sedimentary rocks.

(c) What is metamorphism? Describe the different factors of metamorphism.

(d) Discuss the generation of magma in the different tectonic settings.

(e) Describe the regional progressive metamorphism.

Paper : GE–1(C)

(Physics and Chemistry of Earth)

Unit—I

(*Marks* : 5)

1. Fill in the blanks : 1×3=3

(a) The percentage of the earth's surface covered by water is _____.

(b) The earth is shaped like an _____ spheroid.

(c) The outer layer of the earth is broken into pieces called ____ plates.

2. Write a short note on any *one* of the following : 2

(a) Oceanic trench

(b) Submarine ridge

(c) Continental rise

Unit—II

(*Marks* : 10)

3. Define any *two* of the following : 1×2=2

(a) P-wave

(b) Outer core

(c) Isostasy

4. What are the differences between the Airy and the Pratt models of isostasy? 2

5. Write briefly on any *two* of the following : 3×2=6

   (a) Mohorovicic discontinuity

   (b) Mantle convection

   (c) Seismic shadow zone

Unit—III

(*Marks* : 11)

6. Write short notes on any *two* of the following : 3×2=6

   (a) Aurora borealis

   (b) Magnetosphere

   (c) Solar wind

7. Explain the characteristics of the earth's magnetic field. 5

   Or

   Explain what are meant by secular variation and westward drift.

Unit—IV

(*Marks* : 15)

8. Define the following : 1×3=3

(a) Radioactive decay

(b) Nuclear fusion

(c) Big bang

9. Write short notes on any *three* of the following : 3×3=9

(a) Accretion of the early earth

(b) Differentiation of the early earth

(c) Radioactive dating

(d) Lithophile elements

(e) Siderophile elements

10. (a) Write about the mineralogy of the sublithospheric mantle. 3

Or

(b) Write briefly on the different stable isotopes of oxygen.

Unit—V

(*Marks* : 12)

11. Write short notes on any *two* of the following : 3×2=6

(a) Chemical weathering

(b) Soil remediation

(c) Deep geological repository

(d) Solute transport

12. Write briefly about how lead may enter the environment. 3

13. Write about the adverse effects of lead on human health. 3

★★★