3 (Sem–1/CBCS) GLG HC 1

2022

GEOLOGY

(Honours)

Paper : GLG–HC–1016

(Earth Systems Science)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : ***(any seven)*** 1×7=7

(a) Which of the following constitute the earth as a system ?

(i) Lithosphere and hydrosphere

(ii) Lithosphere, hydrosphere and cryosphere

(iii) Lithosphere, hydrosphere, cryosphere and atmosphere

(iv) Lithosphere, hydrosphere, cryosphere, atmosphere and biosphere

(b) The terrestrial planet with CO_2 as the predominant atmospheric gas is

(i) Venus

(ii) Mars

(iii) Mercury

(iv) Earth

(c) The stratigraphic principles useful in establishing the chronological order in a sedimentary sequence is

(i) law of superposition of strata

(ii) law of faunal succession and law of superposition of strata

(iii) uniformitarianism

(iv) Walther's law

(d) The temperature (Curie point) at which magnetic elements in a cooling magma are magnetised in alignment with the earth's magnetic field is

(i) 500 °C

(ii) 600 °C

(iii) 500 – 600 °C

(iv) < 500 °C

(e) Which of the following regional geomorphic features in Indian subcontinent represents a cratonic block ?

(i) The Himalaya

(ii) The Shillong plateau

(iii) The Naga-Patkai range of hills

(iv) Cachar-Tripura-Mizoram fold belt

(f) The Mid-Atlantic ridge is a

(i) Collision zone

(ii) Subduction zone

(iii) Transform fault

(iv) Divergent margin

(g) Which of the following components of the earth's climate system will have a longer response time to climate change ?

(i) Ice

(ii) Surface water

(iii) Air

(iv) Land surface

(h) The most abundant element in the earth's crust is

(i) O

(ii) Si

(iii) Al

(iv) Fe

(i) Age of the earth is about

(i) 4.6 million years

(ii) 46 billion years

(iii) 4.6 billion years

(iv) 4 billion years

2. Write short notes on : ***(any four)*** 2×4=8

(a) Solar constant

(b) Earth's magnetic field

(c) ITCZ

(d) Rock cycle

(e) Benioff zone

(f) Rift valleys

(g) Lapse rate cooling

(h) Law of crosscutting relationship

3. Write explanatory notes with suitable sketches : ***(any three)*** 5×3=15

(a) Sea floor spreading

(b) Earth's heat budget

(c) Coriolis effect

(d) Soil profile

(e) Relative geological time

(f) Unconformity

(g) Stratigraphic correlation

(h) Layered structure of the earth's atmosphere

4. Answer ***any three*** of following : 10×3=30

(a) Explain with suitable sketches how the atmospheric pressure belts are developed. Add a note on the Hadley cell. 8+2=10

(b) What are the causes of surface ocean currents ? Explain how the subtropic gyres are developed. Give suitable examples. 2+8=10

(c) In a tabular form give the geological time scale showing the boundary time of the periods. What is the basis of these time divisions ? Add a note on the *K-T* (*K – Pg*) boundary issue. 6+2+2=10

(d) Define glacio and tecto eustasy. Explain how sea level changes due to eustasy. 3+7=10

(e) Briefly describe the types and distribution of volcanes. What is the 'Pacific Ring of Fire' ?

(f) Explain how the earth's mantle convection control its geodynamics.

(g) Write an account on the geological setting of NE India using suitable sketches and examples.

(h) What are the geochronological methods suitable for Precambrian chronology ? Explain the basic principles of one of these methods. Add a note on their limitations. 2+6+2=10

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