V/ GEOL (v)

2016

(5th Semester)

GEOLOGY

FIFTH PAPER

(Physics and Dynamics of the Earth)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Describe in brief the depositional landforms produced by glaciers. 7

2. Explain in brief the evolution of landscape. 7

UNIT—II

3. Describe in detail the different types of plate margins. 7

4. What is Isostasy? Explain the hypothesis proposed by Pratt and Airy. 7

UNIT—III

5. Describe in detail the geometric and genetic classifications of faults. 7

6. Write short notes on the following : 3½+3½=7

(a) Pi diagram

(b) Geological significance of unconformities

UNIT—IV

7. Describe in detail the geometric and genetic classification of joints. 7

8. Write short notes on the following : 3½+3½=7

(a) Boudinage

(b) Mullions

UNIT—V

9. Describe in brief the stress-strain diagram. 7

10. Describe with diagram Mohr stress circle and envelope. 7

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Subject Code : V/ GEOL (v)

Booklet No. A

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2016

(5th Semester)

GEOLOGY

FIFTH PAPER

(Physics and Dynamics of the Earth)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

(a) The process by which the earth's surface irregularities are removed and a level surface is created is called

(i) erosion ( )

(ii) gradation ( )

(iii) degradation ( )

(iv) aggradation ( )

(b) The typical rate of spreading at oceanic ridges has been estimated to be

(i) 5 cm per year ( )

(ii) 4 cm per year ( )

(iii) 2 cm per year ( )

(iv) 3 cm per year ( )

(c) The folds which have straight or nearly straight limbs, their crests and troughs become sharp and angular are called

(i) drag folds ( )

(ii) fan folds ( )

(iii) chevron folds ( )

(iv) homocline ( )

(d) Fracture cleavage is inclined to the greatest principal axis at an angle of about

(i) 20° ( )

(ii) 30° ( )

(iii) 10° ( )

(iv) 25° ( )

(e) The algebraic difference between the greatest stress and the least stress at any point in a body is called

(i) tensile stress ( )

(ii) compressive stress ( )

(iii) shearing stress ( )

(iv) stress difference ( )

SECTION—B

(*Marks* : 15)

2. Write short notes on the following in *3* or *4* sentences each : 3×5=15

(a) Stalactite and Stalagmite

(b) Trenches

(c) Recognition of folds in the field

(d) Axial plain cleavage

(e) Plastic deformation

★★★

V/ GEOL (vi)

2016

(5th Semester)

GEOLOGY

SIXTH PAPER

(Earth Surface Processes)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. How is magnetic field generated? Explain the working principle and its significance. 2+5=7

2. Discuss any *two* of the following : 3½×2=7

(a) Elemental abundance in mantle

(b) Mass and density of the earth

(c) Geochronology

UNIT—II

3. Write a descriptive note on geochemical evolution of the earth. 7

4. Discuss the heat loss over the surface of the earth. Add a note on the sources of heat within the earth. 4+3=7

UNIT—III

5. Write a note on any *one* of the following : 7

(a) Orogeny

(b) Epeirogeny

6. What is seafloor spreading? Describe the evidences in support of this theory. 1+6=7

UNIT—IV

7. Write notes on any *two* of the following : 3½×2=7

(a) Mantle plume

(b) Hot spot

(c) Island arc

8. Describe the birth of plate tectonic theory. Explain the evidences in support of this theory. 3+4=7

UNIT—V

9. What is paleoclimatology? Describe different techniques employed to deduce ancient climates. 1+6=7

10. Give an account on the types and causes of ocean currents. 7

★★★

Subject Code : V/ GEOL (vi)

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2016

(5th Semester)

GEOLOGY

SIXTH PAPER

(Earth Surface Processes)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Choose the correct answer and put its number within the brackets provided : 1×5=5

(a) The technique used for dating samples older than one million years is

(i) radiocarbon dating

(ii) uranium-lead dating

(iii) uranium-thorium dating

(iv) potassium-argon dating [ ]

(b) The Curie temperature for most relevant minerals is

(i) 400 °C–500 °C

(ii) 500 °C–600 °C

(iii) 600 °C–700 °C

(iv) 700 °C–800 °C [ ]

(c) During Silurian period, which ocean divides Gondwana from Laurentia and Baltica?

(i) Panthalassic Ocean

(ii) Iapetus Ocean

(iii) Tethys Ocean

(iv) Indian Ocean [ ]

(d) A continental shelf inclines very gently seaward, generally at an angle of

(i) 0·1°

(ii) 0·2°

(iii) 0·3°

(iv) 0·4° [ ]

(e) Which of the following is not a geomorphic indicator of recent tectonic activity?

(i) Faulted Holocene deposits

(ii) Alluvial fans

(iii) Drainage patterns

(iv) Sand dunes [ ]

SECTION—B

(*Marks* : 15)

2. Write on the following in *3–4* sentences each : 3×5=15

(a) Effects of rotation on the earth

(b) Transition zone

(c) Landforms during carboniferous

(d) Active margins

(e) Active faults

★★★

V/ GEOL (vii)

2016

(5th Semester)

GEOLOGY

SEVENTH PAPER

(Petrology)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Write notes on any *two* of the following : 3½×2=7

(a) Fractional crystallization

(b) System, phase, and component

(c) Mixed crystals and their petrological significance

2. Define assimilation. Also write notes on the following : 2+2½+2½=7

(a) Assimilation of acid inclusions by basic magmas

(b) Assimilation of sedimentary rocks by basic magmas

UNIT—II

3. Write the phase relationship of diopside-anorthite-albite system. 7

4. Describe the petrography and petrogenesis of any *two* of the following : 3½×2=7

(a) Gabbro-basalt family

(b) Pyroxenites

(c) Granite-rhyolite family

UNIT—III

5. Discuss the process of formation of sedimentary rocks. 7

6. Describe the textures of sedimentary rocks. 7

UNIT—IV

7. Write the petrographic details of the following : 3½+3½=7

(a) Arkose

(b) Shale

8. Describe, with suitable sketches, the components of a 'sequence' as defined by sequence stratigraphers. How do the sequence boundaries differ from litho-stratigraphic horizons? 5+2=7

UNIT—V

9. Write an essay on the agents of metamorphism. 7

10. Write descriptive notes on any *two* the following : 3½×2=7

(a) Principles of AKF diagram

(b) Texture of metamorphic rocks

(c) Mineralogical phase rule

★★★

Subject Code : V/ GEOL (vii)

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2016

(5th Semester)

GEOLOGY

SEVENTH PAPER

(Petrology)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Choose the correct answer and put its number within the brackets provided : 1×5=5

(a) The intermediate compound in the system nepheline-silica is

(i) sanidine

(ii) enstatite

(iii) albite

(iv) anorthite [ ]

(b) The number of degrees of freedom in a can containing ice and water is

(i) 0

(ii) 1

(iii) 2

(iv) 3 [ ]

(c) What is the porosity of newly deposited mud?

(i) Less than 5%

(ii) Between 5% and 25%

(iii) Between 25% and 50%

(iv) Greater than 50% [ ]

(d) Which of the following is most likely to have been transported and deposited by bedload traction?

(i) Mudstone

(ii) Rock salt

(iii) Conglomerate

(iv) Chalk [ ]

(e) For representation of calcareous rocks, the suitable plot is

(i) ACF

(ii) AKF

(iii) AFM

(iv) AKFM [ ]

SECTION—B

(*Marks* : 15)

2. Write on the following in *3* or *4* sentences each : 3×5=15

(a) Primitive, primary and parental magma

(b) Degrees of freedom

(c) Current ripples

(d) Facies

(e) Barrovian zones

★★★

V/ GEOL (viii) (A)

2016

(5th Semester)

GEOLOGY

EIGHTH (A) PAPER

(Hydrology and Oceanography)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. Describe various methods for the determination of age of groundwater. 7

2. Write notes on the following : 3½+3½=7

(a) Vertical distribution of groundwater

(b) Formation of precipitation

UNIT—II

3. Write short notes on the following : 3½+3½=7

(a) Salinity of groundwater

(b) Formation of springs

4. Write about various water-bearing properties of rock. 7

UNIT—III

5. Write descriptive notes on the following : 3½+3½=7

(a) Continental shelf

(b) Oceanic conveyor belt

6. Write short notes on the following : 3½+3½=7

(a) Pacific ocean current

(b) Temperature variation of sea water

UNIT—IV

7. Write short notes on the following : 3½+3½=7

(a) Pollutants in groundwater

(b) Rain gauge

8. Describe the quality of groundwater for irrigation and industrial purposes. 7

UNIT—V

9. Elaborate the following : 3½+3½=7

(a) Waterlogging problems in India

(b) Earthquake hazard in North-East India

10. Write short notes on the following : 3½+3½=7

(a) Remote-sensing application in groundwater resources

(b) Geological succession of Mizoram

★★★

Subject Code : V/ GEOL (viii) (A)

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2016

(5th Semester)

GEOLOGY

EIGHTH (A) PAPER

(Hydrology and Oceanography)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Choose the correct answer and put its number within the brackets provided : 1×5=5

(a) ^{36}Cl method can be used for dating water sample up to

(i) 12·38 years

(ii) 30 years

(iii) 40,000 years

(iv) 1.5 million years [ ]

(b) TDS of Brine water is

(i) 0–1000 mg/l

(ii) 1000–10000 mg/l

(iii) 10000–100000 mg/l

(iv) 100000 mg/l [ ]

(c) The area with a slope of 1:100 in the ocean hyposography is

(i) abyssal plain

(ii) continental rise

(iii) continental shelf

(iv) continental slope [ ]

(d) Trihalomethane (THM) forms during

(i) chlorination of water

(ii) reverse osmosis process

(iii) infiltration of water

(iv) None of the above [ ]

(e) Cauvery river belongs to the river system of

(i) Indus system

(ii) Brahmaputra system

(iii) Ganga system

(iv) Peninsular drainage system [ ]

SECTION—B

(*Marks* : 15)

2. Write on the following : 3×5=15

(a) Origin of groundwater

(b) Darcy's velocity

(c) Difference between spring tide and reap tide

(d) Man-made pollutants in groundwater

(e) Shillong plateau

★★★