

2 0 1 7

(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. With the help of diagrams, describe in detail various erosional landforms produced by the geological work of glaciers. 7
2. Describe the depositional landforms developed due to the action of a river channel. 7

UNIT—II

3. Write a note on the origin of mountains. 7
4. Describe the utilization of seismic waves in earth's interior studies. 7

UNIT—III

5. Classify various types of faults. Support your answer with the help of diagrams. 7
6. Write notes on the following : 3½+3½=7
 - (a) Mechanism of folding
 - (b) Various components of a fold

UNIT—IV

7. Define foliation. Describe the relationship between foliation and ductile shear zone. 2+5=7
8. Write descriptive notes on the following : 3½+3½=7
 - (a) Mullions
 - (b) Stereographic projections and its applications

(3)

UNIT—V

9. Write a note on the relation of rapture to stress. 7
10. Write on any *one* of the following : 7
- (a) Three stages of deformation
 - (b) Mohr's stress circle and Mohr's envelope

2 0 1 7

(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. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Effect of revolution on the earth
 - (b) Shape and density of the earth

2. What is geochronology? Explain the radiocarbon dating method and its applications. $2+5=7$

UNIT—II

3. Describe the internal structures of the earth with suitable diagram. 7

4. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Heat flow
 - (b) Concept of isostasy

UNIT—III

5. Give an account on evolution of continents and basins with special emphasis on the Indian subcontinent. 7

6. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Formation of Himalayan mountain
 - (b) Epeirogeny

UNIT—IV

7. What is continental margin? Describe different types of plate margin. $2+5=7$

8. Write short notes on any *two* of the following : $3\frac{1}{2}\times 2=7$
 - (a) Mid-oceanic ridge
 - (b) Continental shelf
 - (c) Trenches

(3)

UNIT—V

9. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$

(a) Palaeoclimatology

(b) Active fault

10. Give an account of various factors responsible for atmospheric circulation. 7

Subject Code : GEOL/V/06

Booklet No. A

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GEOL/V/06

2 0 1 7
(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) Which of the following is the inner planet?

(i) Saturn

(ii) Jupiter

(iii) Venus

(iv) Neptune

[]

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(2)

(b) Heat flow is maximum at

(i) trenches

(ii) ridges

(iii) mountains

(iv) continents

[]

(c) The elements with affinity for oxygen are referred as

(i) lithophile

(ii) chalcophile

(iii) siderophile

(iv) atmophile

[]

(d) The Science of landforms including their history and processes of origin is

(i) Geostatigraphy

(ii) Physical Geology

(iii) Petrology

(iv) Geomorphology

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(3)

(e) The last glacial period occurred during

(i) Holocene

(ii) Pleistocene

(iii) Miocene

(iv) Pliocene

[]

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(4)

SECTION—B

(Marks : 15)

2. Write notes on the following in 3 to 4 sentences each :

3×5=15

(a) Elemental abundance in crust

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(5)

(b) Application of geophysics in the study of the earth's processes

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(6)

(c) Seafloor spreading

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(7)

(d) Mantle plume

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(8)

(e) Causes of coastal erosion

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2 0 1 7

(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. Define magmatic differentiation. Write notes on the following : 1+3+3=7
- (a) Fractional crystallization
- (b) Mixed crystals and their petrological significance

2. Write notes on any *two* of the following : 3½×2=7
- (a) Magmatic assimilation
- (b) System SiO₂
- (c) Phase rule

UNIT—II

3. Write the phase relationship of forsterite-silica. 7
4. Describe the petrography and petrogenesis of any *two* of the following : 3½×2=7
- (a) Granite-rhyolite family
- (b) Lamprophyre
- (c) Syenite-trachyte family

UNIT—III

5. Define the term 'diagenesis'. Explain briefly the diagenetic process in siliciclastic sedimentary rocks. 2+5=7
6. What are heavy minerals? Write a note on the applications of heavy minerals in provenance interpretations. 2+5=7

(3)

UNIT—IV

7. Write notes on petrography of the following :
 $3\frac{1}{2}+3\frac{1}{2}=7$
- (a) Limestone
 - (b) Conglomerate
8. Give an account of sedimentary facies and environment. 7

UNIT—V

9. Write a note on metamorphic differentiation. 7
10. Write descriptive notes on any *two* of the following :
 $3\frac{1}{2}\times 2=7$
- (a) Gibbs' phase rule
 - (b) Metasomatism
 - (c) Prograde and retrograde metamorphism

Subject Code : GEOL/V/07

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2 0 1 7

(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 number of phase that can exist at invariant point is

(i) 0

(ii) 1

(iii) 2

(iv) 3

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(2)

(b) The migration of chemical species through magma in response to (gradients) in pressure, temperature or chemical state is called

(i) vapour transport

(ii) diffusion

(iii) filter pressing

(iv) gaseous transfer []

(c) Graded beddings are the result of deposition by

(i) rivers

(ii) blowing wind

(iii) moving ice

(iv) turbidity currents []

(d) Sediment dragged and pushed along the river bed is classified as the

(i) solution load

(ii) bed load

(iii) suspended load

(iv) episodic load []

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(3)

(e) The chemical alteration of rocks by hydrothermal or other fluid is called

(i) pneumatolysis

(ii) metamorphic differentiation

(iii) metasomatism

(iv) polymetamorphism

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(4)

SECTION—B

(Marks : 15)

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

(a) Congruent and incongruent melting

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(5)

(b) System

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(6)

(c) Textural maturity

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(7)

(d) Turbulent flow

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(8)

(e) Khondalites

8G—200/242

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2 0 1 7

(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. What is an aquifer? Describe different types of aquifer with representative diagrams. 7
2. With the help of neat sketches, describe the hydrogeological cycle. 7

UNIT—II

3. Describe Darcy's law with the help of mathematical equation. Also mention its limitations. 5+2=7
4. Write short notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Types of Springs
 - (b) TDS

UNIT—III

5. (a) Write a brief note on continental slope. 3
(b) What is ocean current? Write the causes of ocean current. 1+3=4
6. (a) Write a descriptive note on thermohaline circulation. 3
(b) What is water mass? Write different water masses of the Indian Ocean. 1+3=4

UNIT—IV

7. Describe how groundwater is polluted. Also mention few preventive measures. 4+3=7
8. Write notes on the following : $3\frac{1}{2}+3\frac{1}{2}=7$
 - (a) Quality of water for the purpose of irrigation
 - (b) Various instruments used for measuring the precipitation

(3)

UNIT—V

9. (a) Discuss the causes and problems of water logging in India. $3\frac{1}{2}$

(b) Write a brief note on geotectonic setting of North-East India. $3\frac{1}{2}$

Or

Write a brief note on geological succession of Mizoram. $3\frac{1}{2}$

10. (a) What is the main source of water resources in India? Write the difference between Himalayan and Peninsular drainage system. $\frac{1}{2}+3=3\frac{1}{2}$

(b) What is borehole geophysical logging? Explain any one geophysical method for groundwater exploration. $1+2\frac{1}{2}=3\frac{1}{2}$

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2 0 1 7

(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) The fluid pressure at the zone of saturation is

(i) more than the atmospheric pressure

(ii) equal to the atmospheric pressure

(iii) less than the atmospheric pressure

(iv) equal to the overburden pressure []

/243

(2)

(b) The TDS standard for drinking water is

(i) less than 300 mg/l

(ii) 300–600 mg/l

(iii) 600–900 mg/l

(iv) 900–1200 mg/l

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(c) Salinity of seawater can be expressed as

(i) salinity (%) = $1.80655 \times \text{chlorinity (\%)}$

(ii) salinity (%) = $1.90655 \times \text{sodium chloride (\%)}$

(iii) salinity (%) = $1.90655 \times \text{chlorinity (\%)}$

(iv) None of the above

[]

(d) Which parameter is most commonly used for evaluating groundwater suitability for irrigation purposes?

(i) Sodium Adsorption Ratio (SAR)

(ii) Ratio of Dissolved Sodium (RDS)

(iii) Residual Sodium Carbonate (RSC)

(iv) Total Dissolved Solids (TDS)

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GEOL/V/08a/243

(3)

(e) Which of the following rivers is not belong to Himalayan drainage system?

(i) Beas

(ii) Cauvery

(iii) Chambal

(iv) Damodar

[]

(4)

SECTION—B

(Marks : 15)

2. Write notes on the following :

3×5=15

(a) Various hydrogeological parameters

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(5)

(b) Retention and yield of groundwater

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(6)

(c) Gulf stream

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(7)

(d) Physical and chemical parameters of drinking water

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(8)

(e) Bhuban Formation in Mizoram

8G—200/243

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2 0 1 7
(5th Semester)

GEOLOGY

FIFTH PAPER

(Physics and Dynamics of the Earth)

(PART : A—OBJECTIVE)

(Marks : 20)

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SECTION—A

(Marks : 5)

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

(a) Arête is a/an _____ landform formed by _____.

(i) depositional, wind

(ii) erosional, wind

(iii) depositional, glaciers

(iv) erosional, glaciers

[]

/240

(2)

(b) On the basis of the period of origin, the Himalayan mountains belong to

(i) Precambrian

(ii) Caledonian

(iii) Hercynian

(iv) Alpine []

(c) In an overturned fold, one limb has been tilted more than

(i) 45°

(ii) 90°

(iii) 180°

(iv) 270° []

(d) When joints are filled with minerals, they are called

(i) veins

(ii) fissures

(iii) dykes

(iv) sills []

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(3)

(e) If the deformation (of rock) involves changes in volume only, the strain is called

(i) distortion strain

(ii) couple strain

(iii) dilatation strain

(iv) shear strain

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(4)

SECTION—B

(Marks : 15)

2. Write short notes on the following in 3 or 4 sentences each : 3×5=15
- (a) Depositional landforms produced by wind

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(5)

(b) World distribution of earthquakes

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(6)

(c) Criteria for the recognition of an unconformity

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(7)

(d) Fracture cleavage

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(8)

(e) Types of stresses

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