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3 SEM TDC GEGL (CBCS) GE 3 (A/B/C)

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(Held in January/February, 2022)

GEOLOGY

(Generic Elective)

Paper : GE-3

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

Paper : GE-3A

(**Structural Geology and Tectonics**)

Unit—I

(**Structural Geology**)

(Marks : 27)

1. What is stress? What are the different types of stresses?

1+4=5

(2)

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

(a) Dip and strike

(b) Joints

(c) Strain

(d) Strain ellipse

3. What are topographic and structural map? Write the effects of topography on structural features. 2+4=6

Or

What are folds? What are the geometrical elements of folds? 2+4=6

4. Fill in the blanks : 1×2=2

(a) _____ is the maximum angle of a dip on the rock bed.

(b) _____ is an upfold where the limbs dip away from the axis of fold on either side.

5. What is a fault? Write about different types of faults. 1+4=5

Or

What are the roles of structural features in the accumulation of oil and natural gas? 5

(3)

Unit—II

(**Tectonics**)

(*Marks : 26*)

6. What is plate tectonics? Write about different types of plate boundaries. 2+4=6

Or

Write brief notes on seafloor spreading and mid-oceanic ridges. 3+3=6

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

- (a) Continental and oceanic crust
- (b) Formation of ocean
- (c) Convergent plate boundary
- (d) Tectonic activities and rock deformation

8. Write a short note on important features associated with plate boundaries. 4

(4)

9. What is continental drift? Write details with some evidences.

5

Or

Write the role of tectonic activities in the development of structural features and typical landforms.

10. Fill in the blanks :

1×2=2

- (a) When two plates slide past one another then it is called a _____ boundary.
- (b) _____ is made up of crust and top part of the upper mantle.

(5)

Paper : GE-3B

(Fossils and Their Applications)

Unit—I

(Introduction to Fossils)

(Marks : 8)

1. Fill in the blanks (any four) : 1×4=4

(a) A species living in present also found as fossil in pre-historic rock records is called _____.

(b) The process by which iron pyrite replaces organic matter in rock is called _____.

(c) In the process of moulding and casting, sometimes internal parts are cast which is called as _____.

(d) *Otozamites* belongs to _____ Gondwana.

(e) _____ characterise short sections of the geological succession.

2. Write short notes on any two of the following : 2×2=4

(a) Range zone

(b) Derived fossil

(c) Pseudofossil

(7)

Unit—IV

(Application of Fossils)

(Marks : 10)

7. What do you mean by the term 'palaeogeographic reconstruction'? How does fossil help in palaeogeographical studies? 5

Or

Write briefly on how palaeontological evidences help to determine palaeoecology.

8. What is the difference between palaeobiogeography and palaeoecology? Give examples. 5

Unit—V

(Societal Importance of Fossils)

(Marks : 10)

9. Write short notes on any two of the following : $3 \times 2 = 6$
- (a) Maturity of hydrocarbons
 - (b) Fossils associated with mineral deposits
 - (c) Applications of spores and pollens
10. Write briefly on applications of fossils in mineral exploration and reservoir correlation. 4

(8)

Paper : GE-3C

(**Martian Geology**)

Unit—I

(Marks : 8)

1. Choose the correct option : 1×3=3

(a) NASA's Curiosity Rover Mission was launched on

(i) 18th December, 1965

(ii) 26th November, 2011

(iii) 19th February, 1975

(iv) 25th December, 1991

(b) Mangalyaan Mission was launched on

(i) 5th November, 2013

(ii) 10th December, 2011

(iii) 6th January, 2009

(iv) 7th February, 1984

(c) To investigate how Mars lost that abundant atmosphere, NASA launched the MAVEN spacecraft on

(i) 18th November, 2013

(ii) 2nd February, 2011

(iii) 30th December, 1988

(iv) 5th January, 2009

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(Continued)

(9)

2. Briefly discuss the goals of sending Perseverance (mover) to Mars. Where did the Perseverance land in Mars? 4+1=5

Unit—II

(Marks : 10)

3. Write short notes on any *two* of the following : 5×2=10
- (a) Mars' interior
 - (b) Mars' atmosphere
 - (c) MAVEN mission

Unit—III

(Marks : 13)

4. (a) Write a short note on Olympus Mars. 5
- (b) Briefly discuss any *two* of the following : 4×2=8
- (i) Dunes on Mars' surface
 - (ii) Evidence of water on Mars' surface
 - (iii) Surface provinces of Mars

(10)

Unit—IV

(Marks : 10)

5. Write an elaborate description of the Pre-Noachian, Noachian, Hesperian and Amazonian periods in the history of evolution of Mars.

10

Unit—V

(Marks : 12)

6. Write short notes on the following : $4 \times 3 = 12$

- (a) Evidence of life on Mars
- (b) Conditions supportive for permanent Mars occupation
- (c) Terraforming of Mars

(6)

Unit—II

(Species Concept)

(Marks : 12)

3. What are type species? Write about different types of specimen types. 6

Or

Write about the methodology adopted in nomenclature of fossils.

4. Write about the method of description of fossils. 6

Unit—III

(Introduction to Various Fossil Groups)

(Marks : 13)

5. Write short notes on the following (any three) : 4×3=12

- (a) Spores and Pollen
- (b) Marker Fossil
- (c) Cretaceous of Trichinopoly
- (d) Intertrappean Beds

6. Fill in the blank : 1
Productus semireticulatus belongs to _____ age.