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5 SEM TDC DSE GEO (CBCS) 1 (A/B) (H)

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(Held in January/February, 2022)

GEOLOGY

(Discipline Specific Elective)

(For Honours)

Paper : DSE-1

Full Marks : 53

Pass Marks : 21

Time : 3 hours

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

Paper : DSE-1 (A)

(**Exploration Geology**)

UNIT—I

(Marks : 11)

1. Write short notes on the following^{*}
(any three) : 2×3=6

(a) Minerals

(b) Ore reserve

(2)

(c) Mineral resource

(d) Ore

(e) Strategic mineral

2. (a) What techniques are used to find ore deposits?

5

Or

(b) Explain how any one of the following types of ore deposits form with suitable examples :

5

(i) Magmatic deposits

(ii) Hydrothermal deposits

(iii) Sedimentary deposits

UNIT—II

(Marks : 15)

3. Fill in the blanks of the following : $1 \times 3 = 3$

(a) The normal range of concentration of elements in regional perspective is _____ (background/threshold).

(b) The geochemical envelope, which is an expression of alteration and zoning conditions surrounding metalliferous deposit, is called _____.

- (c) The process of penetrating through the ground and extracting rocks from various depths beneath the surface for confirming the geology beneath and/or providing samples for chemical analysis is known as ____.
4. (a) Briefly explain the stages of exploration. 6
Or
(b) Write on the role of geochemistry in mineral exploration. 6
5. Write briefly on any *two* of the following :
3×2=6
- (a) Soil sampling
(b) Geobotanical indicators
(c) Pathfinder element
(d) Background and threshold value

UNIT—III

(Marks : 5)

6. Define the following : 1×3=3
- (a) Mean
(b) Mode
(c) Median

7. What is measured by the sample standard deviation? 2

UNIT—IV

(Marks : 10)

8. What is core in drilling and what is meant by core logging? 4
9. (a) Write an essay on types of drilling. 6
- Or
- (b) Explain about drilling mud—its role and effects on logging. 6

UNIT—V

(Marks : 12)

10. Describe any *two* of the following reserve estimation methods : $3 \times 2 = 6$
- (a) Square
- (b) Polygon
- (c) Triangular
11. (a) What is the purpose of ore reserve estimation? 6
- Or
- (b) What are the factors affecting ore reserve estimation? 6

(5)

Paper : DSE-1 (B)

(Fuel Geology)

UNIT—I

(Coal)

(Marks : 11)

1. What is coal? Write about the origin of coal.

1+4=5

Or

Write about the ultimate analysis of coal. 5

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

2×2=4

(a) Macerals in coal

(b) Classification of coal

(c) Coal lithotype

3. (a) Arrange the coal types on the basis of carbon content in increasing order :

1

(i) Peat < Lignite < Anthracite

< Bituminous

(ii) Lignite < Anthracite < Bituminous

< Peat

(iii) Peat < Lignite < Bituminous

< Anthracite

(iv) Peat < Bituminous < Lignite

< Anthracite

(Turn Over)

(6)

- (b) Coals derived from non-woody parts of plants are called ____ (humic coal/ sapropelic coal).

1

(Fill in the blank)

UNIT—II

(Coal as a Fuel)

(Marks : 9)

4. What is coal bed methane? How is coal bed methane produced? 2+3=5

5. What is underground coal gasification? 4

Or

- What is coal liquefaction? What is the use of coal liquefaction? 2+2=4

UNIT—III

(Petroleum)

(Marks : 11)

6. Describe the chemical composition of petroleum. 4

7. What are the theories regarding the origin of petroleum? 4

8. How is kerogen form in the source rock? Describe in brief. 3

(7)

UNIT—IV

(Petroleum Reservoir and Traps)

(Marks : 17)

9. Write short notes on any *three* of the following : 2×3=6
- (a) Reservoir rock
 - (b) Clastic reservoir rock
 - (c) Characteristic properties of reservoir rocks
 - (d) Cap rock
10. What is a petroleum trap? Describe briefly. Write a note on classification of traps. 2+6=8
11. How is plate tectonics responsible for the formation of petroleum pools? 3

UNIT—V

(Other Fuel)

(Marks : 5)

12. What is gas hydrate and what is the nuclear fuel? 2½+2½=5

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