Indian Forest Service
(Main) Exam, 2021

ZCVB-U-GLY

GEOLOGY

Paper – I

*Time Allowed : **Three** Hours*

*Maximum Marks : **200***

Question Paper Specific Instructions

Please read each of the following instructions carefully before attempting questions :

*There are **EIGHT** questions in all, out of which **FIVE** are to be attempted.*

*Questions no. **1** and **5** are **compulsory**. Out of the remaining **SIX** questions, **THREE** are to be attempted selecting at least **ONE** question from each of the two Sections A and B.*

Attempts of questions shall be counted in sequential order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly stuck off.

All questions carry equal marks. The number of marks carried by a question/part is indicated against it.

Neat sketches may be drawn, wherever required.

*Answers must be written in **ENGLISH** only.*

SECTION A

Q1. Answer the following within 150 words each :

(a) What are the evidences in favour of the theory of plate tectonics ? *8*

(b) Which factors control floods in rivers ? *8*

(c) How would you distinguish between an unconformity and a fault ? *8*

(d) What are the principles of recognizing lithology from aerial photographs ? *8*

(e) How do we come to know that the core of the Earth is chiefly made up of iron ? How do we estimate the age of core formation ? *4+4*

Q2. (a) How would you distinguish between different types of meteorites based on composition, mineralogy and texture ? How do meteorite studies improve our understanding of the evolution of the Earth ? *10+5*

(b) Illustrate the genetic classification of joints with suitable sketches. *10*

(c) How do earthquakes cause damage ? How do we reduce the risk of damage by earthquakes ? *15*

Q3. (a) What do you understand by Mass Wasting ? Describe different processes of mass wasting. What are the preventive measures to mitigate the risk of hazards due to mass wasting ? *15*

(b) Elucidate with example the principle of determination of absolute age of rocks. *10*

(c) Distinguish between Strike-slip fault and Dip-slip fault. Illustrate with diagram the effect of erosion on rock blocks having apparent movement. *15*

Q4. (a) Describe different types of planar structures in folded strata. How do you use cleavage to determine structures in three dimensions ? *15*

(b) What is Weathering ? Describe different processes of weathering with suitable examples. *10*

(c) What is a nappe ? Describe the structure of window and klippe. How do they differ from outlier and inlier structures ? Explain with suitable diagrams. *15*

SECTION B

Q5. Answer the following within 150 words each :

(a) Briefly describe the species concept and problems of adopting biological species concept in Palaeontology. *8*

(b) With the help of neat diagram describe evolutionary trends in Equidae. *8*

(c) Describe in brief Cretaceous/Tertiary boundary problem with reference to India. *8*

(d) What is the hardness of a groundwater which contains 20 mg/L of calcium and 5 mg/L of magnesium ? *8*

(e) Describe the different terminologies of a dam and explain various types of dams. Which geologic investigations need to be carried out for construction of a successful dam ? *8*

Q6. (a) Discuss with the help of neat diagram morphology of Brachiopod. Add a note on their development of deltidium. *15*

(b) What is Darcy's Law ? What are its limitations ? *10*

(c) Describe the stratigraphy of Mesozoic of Kuchh mentioning characteristic fossils from each unit. *15*

Q7. (a) Discuss in detail the Precambrian stratigraphy of the Singhbhum craton. *15*

(b) Discuss the palaeoecological significance of Foraminifera and add a note on their uses in oil exploration. *10*

(c) What is the Ghyben-Herzberg relationship between fresh and saline waters ? *15*

Q8. (a) Explain in detail morphology of Graptolites. What are the characteristic features that make them index fossils for the Lower Palaeozoic ? *15*

(b) What are chronostratigraphic units ? Illustrate the methods of chronostratigraphic correlation. *10*

(c) Which geologic factors need to be considered for tunnelling in consolidated rocks ? *15*