Combined Geo-Scientist & Geologist Exam,2019

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 ELEVEN questions divided under SIX Sections.

Candidate has to attempt SIX questions in all. The ONLY question in Section—A is compulsory. Out of the remaining TEN questions, the candidate has to attempt FIVE, choosing ONE from each of the other Sections B, C, D, E and F.

The number of marks carried by a question/part is indicated against it.

Symbols, abbreviations and notations have their usual standard meanings.

Neat sketches are to be drawn to illustrate answers, wherever required.

Wherever required, graphs/tables are to be drawn on the Question-cum-Answer Booklet itself.

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 struck off.

Answers must be written in ENGLISH only.

SECTION—A

(Compulsory Section)

1. Describe the following in brief with diagrams wherever necessary : 5×10=50

(a) Measurement of strain from deformed conglomerates

(b) Ductile shear

(c) Image filtering in remote sensing

(d) Assemblage zone

(e) Pandyan Mobile Belt

(f) Glossopteris flora

(g) Upper Siwalik fauna from India

(h) Chemical denudation

(i) Continental growth

(j) Low-velocity zone in the mantle

SECTION—B

Attempt *any* **one** question

2. *(a)* Describe with sketches, the drainage pattern associated with faulted and folded regions. Give two examples of anomalous drainage indicative of Neotectonism. 15

(b) Describe the landforms produced by glacial and fluvial actions with examples from India. 15

3. *(a)* Enumerate the salient features of aerial photographs and remote sensing imagery. 10

(b) Illustrate the principle of using remote sensing in mineral exploration. 10

(c) Write a note on the Indian satellite Cartosat 2. 10

SECTION—C

Attempt *any* **one** question

4. *(a)* What is the principle for the construction of Mohr diagram for 2-dimension stress? Illustrate with neat sketches, Mohr diagrams for some representative states of stress. 15

(b) What are joint sets and joint systems? Briefly discuss the mechanism of formation of joints. 15

5. *(a)* Illustrate with neat sketches, Ramsay's classification of folded layers. 10

(b) What are the major types of strike-slip faults? Enumerate with suitable sketches, characteristics and structures associated with the strike-slip faults. 10

(c) Illustrate with neat sketches, the interference patterns that are likely to develop due to superposed deformation. 10

SECTION—D

Attempt *any* **one** question

6. *(a)* Critically evaluate the theory of continental drift. 15

(b) How would you distinguish among mid-oceanic ridges, oceanic trenches and mountain chains from gravity anomaly data? 15

7. *(a)* "Plate tectonics did not begin all at once." Justify the statement. 10

(b) What are the major types of orogeny? How can these types be explained with the help of plate tectonics? 10

(c) Briefly discuss the emergence and evolution of the Himalaya. 10

SECTION—E

Attempt *any* **one** question

8. *(a)* Give an account of Precambrian stratigraphy of the Singhbhum Craton with reference to stratigraphic succession, lithology and geochronology. 15

(b) Give the stratigraphic succession of the Vindhyan Supergroup. Comment on the sedimentation history and the age of the Vindhyan Supergroup. 15

9. *(a)* Give the hierarchical classification and definition of lithostratigraphic units. Discuss the methods of lithostratigraphic correlation. 10

(b) Illustrate the principle of radiometric dating of rocks with example from Sm-Nd decay series. Comment on the advantages and disadvantages of the Sm-Nd method of dating. 10

(c) Briefly describe the nature of the Deccan Volcanic Province. Comment on the geodynamics of the Deccan Volcanic Province. 10

SECTION—F

Attempt *any* **one** question

10. *(a)* Discuss the timing, causes and impact of mass extinction events which led to the disappearance of trilobites and dinosaurs in the earth history. 15

(b) Elucidate the rationale behind using stable isotopes of oxygen and carbon from animal shells for reconstructing the palaeoclimate. 15

11. *(a)* Explain with diagrams, the morphology of Ammonoids and add a note on the evolution of their suture pattern. 10

(b) Describe the internal structure of Brachiopod shells with suitable diagrams. 10

(c) Give an account of the evolution of Equidae. 10

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