(k) How do you define trace fossil?

(l) Why is attrition process dominant in Aeolian condition?

(m) How did amino acid form in early Earth?

(n) What are hyperthermophiles?

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B. Sc. GEOLOGICAL SCIENCE EXAMINATION, 2024

(1st Year, 1st Semester)

EARTH SYSTEM SCIENCE

PAPER : Core/TH/01

Time : *Two Hours* *Full Marks* : 40

(*Use a separate Answer script for each part*)

PART—I (Marks 20)

Answer *any four* questions from the following :

1. *(a)* Show that the gradient of a scale quantity in a Cartesian space is a vector.

(b) What do you understand by Planck time?

(c) With the help of examples explain the fundamental difference between classical mechanics and quantum mechanics. 2+1+2=5

2. *(a)* Define a system.

(b) What are the basic elements to construct a system? Answer with an example.

(c) Explain the difference between an isolated and a closed thermodynamic system. 1+2+2=5

3. (a) Using diagrams show the characteristics of compressional and shear waves.

(b) Prove that a shear wave cannot travel in a fluid medium.

(c) Show that P-waves necessarily travel faster than S-waves in any elastic medium. 2+1+2=5

4. (a) What is Mohorovicic discontinuity and how is it detected?

(b) Describe the internal structure of the Earth. 2+3=5

5. (a) Oceanic crusts across mid-ocean ridges show a systematic variation in their paleomagnetic characteristics both in space and time. Explain this geological phenomenon.

(b) With the help of a geological example demonstrate the principle of reconstructing a polar wander path. 3+2=5

6. (a) What is a lithospheric plate?

(b) With examples explain convergent and divergent tectonic boundaries.

(c) From a diagram show how an oceanic plate descends against another plate. 1+2+2=5

PART—II (Marks 20)

1. **Answer *any ten* questions from the following : 2×10=20**

(a) Name a sedimentary rock which has not derived from weathering of pre-existing rocks.

(b) What is insolation?

(c) Explain temporary base level?

(d) An area with 800 m and another one with 100 m relief with respect to sea level are located in a humid climate. Where do you expect more erosion? Explain.

(e) How do the tectonisms control sedimentation?

(f) What are the agents of erosion and transportation?

(g) What are terrigenous deposits?

(h) Why are aeolian sediments more rounded compare to fluvial sediments?

(i) Do paleoflow directions always show paleoslope directions?

(j) How did the ozone layer form on Earth?