Mahindra University Hyderabad

École Centrale School of Engineering
Minor I Examination
(2023 – Batch)

Program: B. Tech. **Branch: All** **Year: I** **Semester: I**
Subject: Earth & Environmental Sciences (CE1101)

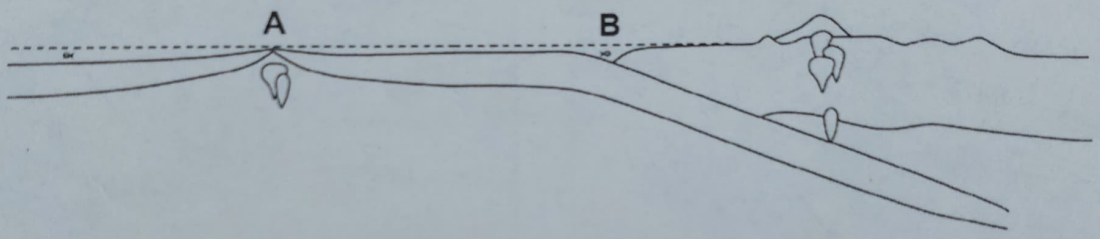
Date: 19-09-2023 **Start Time: 02:00 pm**
Time Duration: 1.5 Hours **Max. Marks: 50**

Instructions:

1) Read questions carefully and answer to the point.
2) Each question carries ten marks.

Q1. The cross-section below shows the tectonic plates beneath an ocean and nearby continent. The sea level is indicated by the dashed line. Answer the below questions in one sentence.

[10 x 1 = 10 M]



(a) What type of plate boundary is at location A?

(b) What type of plate boundary is at location B?

(c) At which location can we observe subduction?

(d) What kind of topography is formed at location B on the continental plate?

(e) What geological events occur at location A?

(f) At which location can we find deep oceanic trenches?

(g) Where can we find the younger crust?

(h) Deep-focus earthquakes occur along or near which location?

(i) What drives the plate motions?

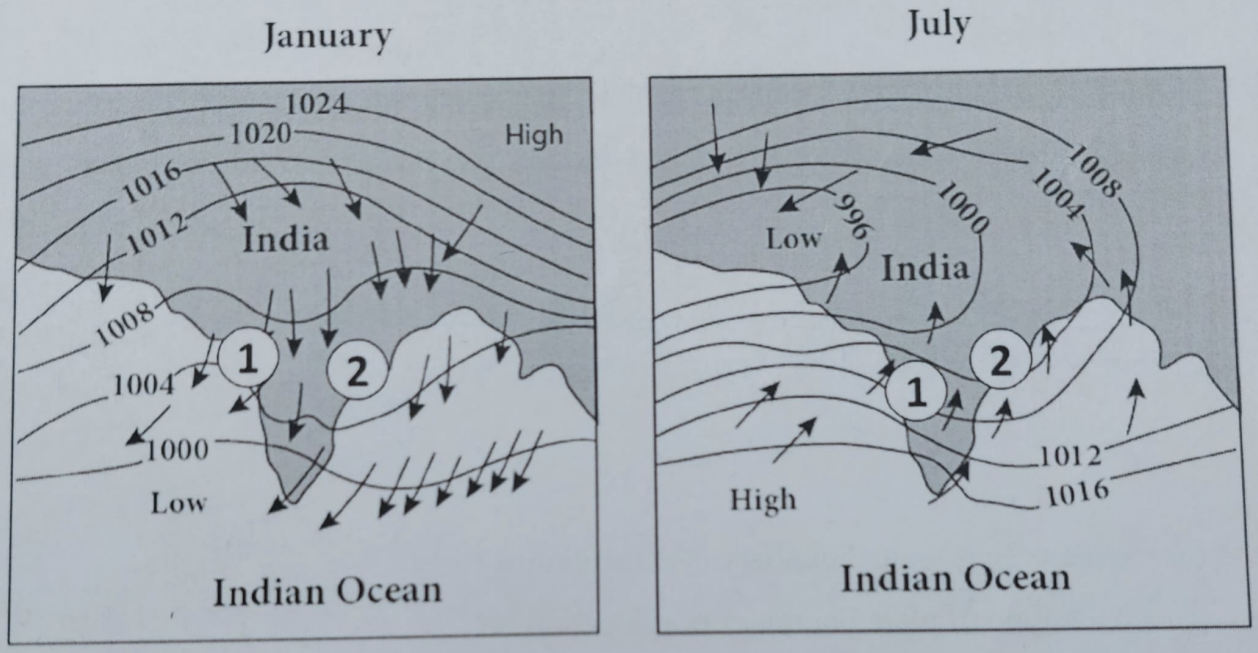
(j) Which of these plates has greater density?

Q2. How did Earth's early atmosphere differ from the modern atmosphere, and what processes led to this evolution? **[1 x 10 = 10 M]**

Q3. Draw a diagram to illustrate the interactions between the geosphere, atmosphere, cryosphere, biosphere, and hydrosphere. **[1 x 10 = 10 M]**

Q4. Explain the concept of thermohaline circulation and its role in regulating global climate patterns. Discuss how human activities may disrupt this circulation with examples. **[1 x 10 = 10 M]**

Q5. The map below depicts sea-level pressure and surface wind vectors over India for the months of January and July. The contours represent pressure (isobars) in millibars. The isobars have an interval of 4 millibars. The arrows represent the wind vectors which show wind direction. Answer the following questions based on the map.



(a) Calculate the highest-pressure difference observed from the isobars in the months of January and July. **[2 M]**

(b) In January and July, what kind of phenomenon takes place in the coastal areas of the Arabian Sea and the Bay of Bengal (locations 1 & 2) due to the Coriolis effect and Ekman transport. **[8 M]**