

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH KOLKATA
Mid-semester Examination, Spring 2019

Course: ES2202 – Structural Geology and Tectonics. (BS-MS 2nd Year)

Full marks: 20

Time: 1 hour

Date: 19/02/2019

Instructions:

- Answer **ALL** questions briefly and to the point. Q1 and Q2 may be answered on the question paper itself.

Name:

Roll number:

1. Where would you expect the oldest oceanic crust in the Pacific Ocean among the 4 options listed below? Write the reason for choosing the correct answer. (1.5)
 - a. East Pacific Rise
 - b. Trench along the western margin of South America
 - c. Mariana Trench
 - d. Below the island of Hawaii

2. If there is a decrease in the average age of ocean floor in the next century due to enhanced magmatic activity what will happen to the global sea level? Write the reason for choosing the correct answer.
 - a. Rise
 - b. Fall
 - c. No change
 - d. Eustatic changes are not related to plate tectonics (2)

3. What are hotspots? Give an example. (1)

4. Basaltic magma is being generated at mid-ocean ridges, hot-spots as well as in island arcs. Is the process of magma generation same at all of these tectonic

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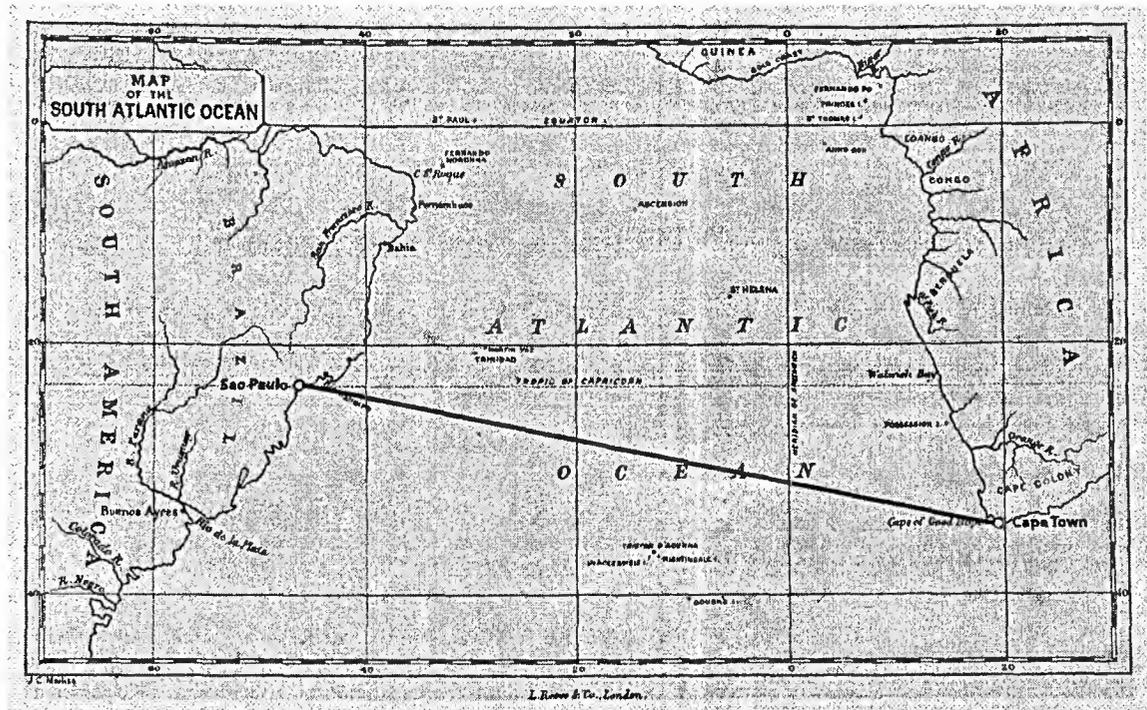
settings? Briefly explain the process(es) and highlight the similarity and/or differences. (3)

5. Can there be an extensional basin at a convergent plate boundary? Explain briefly, with the help of a suitable diagram, how it can be formed. (3)

6. Mention all the forces acting on tectonic plates at convergent and divergent boundaries with the help of a suitable diagram. (3.5)

7. How can development of an orogenic mountain belt lead to global cooling? (3)

8. Given below is the map showing the cities Cape Town (South Africa) and Sao Paulo (Brazil). The actual distance between the two cities at present is 6375 kilometers. If a plane covers the distance along the straight line path in 8 hours and 30 minutes at present, how long will the plane, with the same speed, take after 10 million years from now? Give the answer in hour-minute format. The half spreading rate of the mid-Atlantic ridge is 2.25 cm/year. (Assumption: The flight path is perpendicular to the mid-Atlantic ridge). All calculations must be shown. (3)



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