



# INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR

Mid-Autumn Semester 2018-19

Date of Examination : \_\_\_\_\_ Session (FN/AN) \_\_\_ Duration 2 hrs Full Marks: 60  
 Subject No. : GG21109 Subject : ENGINEERING & ECONOMIC GEOLOGY \_\_\_\_\_  
 Department/Center/School : Geology and Geophysics \_\_\_\_\_  
 Specific charts, graph paper, log book etc., required: None \_\_\_\_\_  
 Special Instructions (if any): Attempt all questions \_\_\_\_\_

**Q. No. 1:** Why the abundance of elements heavier than iron are very low in the Universe? Prove that the Sun has not formed during the “Big Bang”. Discuss the differential distribution of elements in Earth’s core, crust, and atmosphere considering their affinity to bond with other elements. (3+2+5=10)

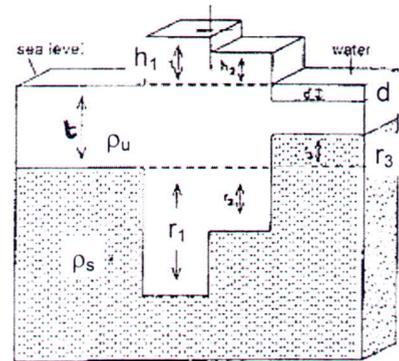
**Q. No. 2:** Describe the rock cycle with the help of a cartoon with proper arrows. Write the differences between P-waves and S-waves and explain how we determined that outer core is in liquid state. [5+3+2=10]

**Q. No. 3:** What is Lithosphere and how it is different from the Asthenosphere (sketch required)?

Using the supplied figure and equation provided, find out the thickness of the earth’s crust at Mount Everest Region whose height is ~9 km. (average density of the crust and mantle would be ~2.7 g/cm<sup>3</sup> and ~3.3 g/cm<sup>3</sup> respectively, and average thickness of the crust would be ~35 Km).

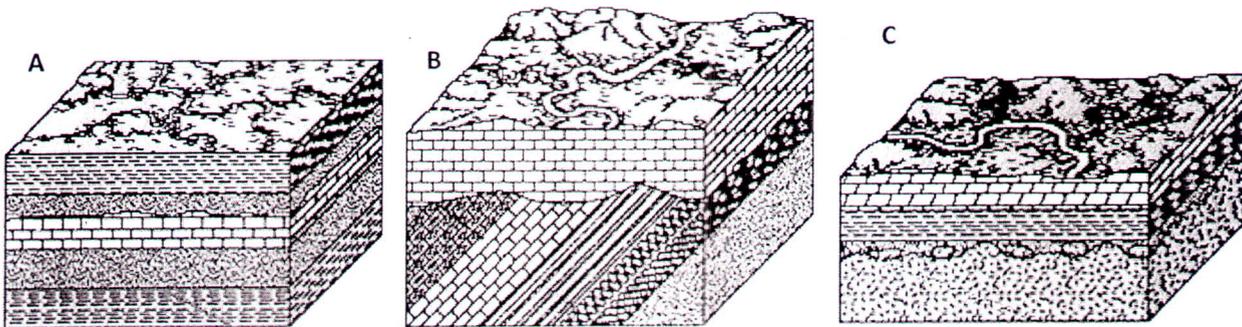
[5+5=10]

$$r_1 = \frac{h_1 \rho_u}{\rho_s - \rho_u}$$



**Q. No. 4:** What are the seven basic principles of Stratigraphy, which we use to establish a relative time scale for different rock deposits? Explain the principles in a few words. [10]

**Q. No. 5:** Identify the following types of unconformity and write short notes on how they have formed. Can you write the name of the missing Unconformity not shown in the figures below? [9+1=10]



**Q. No. 6:** Write the names of the different classes of the silicate minerals when classified based on the arrangement of SiO<sub>4</sub> tetrahedron and provide rough sketch. (10)

