LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

M.Sc. DEGREE EXAMINATION – PHYSICS

SECOND SEMESTER – APRIL 2017

16PPH2ES02- GEOPHYSICS

Date: 28-04-2017   Dept. No.   Max. : 100 Marks
01:00-04:00

PART A

Answer ALL Questions   (10x2=20)

1. How do human activities induce earthquake?

2. Write a short note on tsunamis.

3. Name the different layers of Earth's interior?

4. With neat diagram, explain the significance of P-wave shadow zone.

5. Define magnetic Reynold's number.

6. Write a short note on Isochoron plot of radio active dating methods.

7. Draw time travel curve for seismic waves.

8. List out the parameters which affect acceleration of gravity.

9. What do you mean by mohorovicic discontinuity?

10. Differentiate geoid and spheroid surfaces on Earth?

PART B

Answer ANY FOUR Questions   (4x7.5=30)

11. Write briefly on constructive, Destructive zones and transform faults.

12. How do you analyze the intensity of earthquake?

13. Draw neatly horizontal seismograph and explain its working.

14. A radioactive substance has disintegration constant $\lambda=1.44 \times 10^{-3}$ /day .In what time will 75% of the initial number of atoms integrate.?

15. The earthquake is recorded at the three stations with the following respective S-P time intervals.

$t1^{S-P} = 26.7$ s

$t2^{S-P} = 27$ s

$t3^{S-P} = 23$ s

Given that the focus is at the surface .the P-wave velocity is constant and equal to 8 Km/s and poisson's ratio is 1/3, calculate the co-ordinates of the epicentre.

16. Write a short note on "Temperature and pressure" with in the earth.

PART C

Answer ANY FOUR Questions   (4x12.5=50)

17. With a neat diagram explain the types of seismic waves?

18. Give an account on continental drift by plate tectonic theory.

19. What is geochronology? Explain Rb-Sr method of age determination of rocks?.

20. a. What is the significance of electric mapping in resistivity analysis?

b. Obtain an expression for resistivity by single current electrode at depth. By mise-a-la-masse method determine the electrical resistivity ρ, with applied potential 8 V, observed through 3m separation of electrodes with current of 10mA.

21. Explain the working of flux gate magnetometer and discuss its merits and demerits.

22. The magnitude Ms of an earthquake as calculated for surface waves of period 20 s is 6.13.

a. Calculate the amplitude of these waves at a station 3000km away. If the instrument's amplification is 1500 ,what will be the amplitude of the seismogram's waves and seismic energy?

b. If Mw=Ms ,and the area of the fault is 12kmx8km and $\mu = 4.4 \times 10^4$ Mpa ,find the fault slip $\Delta\mu$.

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