LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – **PHYSICS**

FOURTH SEMESTER – **APRIL 2023**

UPH 4603 – GEOPHYSICS

Date: 06-05-2023 Dept. No. Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

	SECTION A - K1 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
1.	**Definitions**	
a)	Focus of earthquake.	
b)	Guttenberg-Wiechert discontinuity.	
c)	Geochronology.	
d)	Magma.	
e)	Liquefaction.	
2.	**Fill in the blanks**	
a)	The asthenosphere is _____.	
b)	The lithosphere is approximately _____ kilometres thick.	
c)	_____element makes up most of the Earth's core.	
d)	_____theory explains the cause of tsunamis.	
e)	_____ is used for measuring absolute and relative gravity.	
	SECTION A - K2 (CO1)	
	Answer ALL the Questions	**(10 x 1 = 10)**
3.	**True or False**	
a)	The P-wave shadow zone is larger than the S-wave shadow zone.	
b)	Seismic waves follow curved paths through the interior of the Earth.	
c)	Liquids do not transmit S waves.	
d)	The Earth's crust contains the lithosphere.	
e)	The age of the earth is determined by radioactive dating of rocks and minerals.	
4.	**MCQ**	
a)	Where does the P waves travel faster? i. Upper mantle ii. Lower mantle iii. Outer core iv. Inner core	
b)	What drives plate tectonics? i. Thermal convection ii. Thermal conduction iii. Solar energy iv. Erosion	
c)	Where is the Earth's magnetic field generated? i. In the crust ii. In the mantle iii. In the outer core	

	iv. In the inner core
d)	Which method is used for preparing pseudo cross sections for electrical resistivity data and interpretation? i. Geo referencing using Arc GIS software ii. Electrical methods iii. Geochemical methods iv. None of the above
e)	What is the primary cause of the Earth's magnetic field? i. The gravitational potential of the Earth ii. Laplace's equation iii. The Worden gravimeter iv. The dynamo theory of Earth's magnetism
	SECTION B - K3 (CO2)
	Answer any TWO of the following (2 x 10 = 20)
5.	a) Analyze the given problem and express your understanding in detail. Earth's inner core is made primarily of iron. Its temperature is about 5700 K, which is greater than the iron's melting point (1800 K). (5) b) Summarize the characteristics of Geographic Information System (GIS). (5)
6.	Explain the internal structure of earth with neat sketch.
7.	Discuss geoelectrical resistivity data collection, analysis and interpretation.
8.	Explain elastic rebound theory and how subduction zones are formed.
	SECTION C – K4 (CO3)
	Answer any TWO of the following (2 x 10 = 20)
9.	Discuss radioactive dating of rocks and minerals.
10.	a) Differentiate between primary and secondary effects of Earthquake. (5) b) Outline the classification of seismic waves. (5)
11.	Define the gravitational potential energy and derive its expression.
12.	Explain the dynamo theory of Earth's magnetism.
	SECTION D – K5 (CO4)
	Answer any ONE of the following (1 x 20 = 20)
13.	Describe the causes and impacts of Tsunami and discuss about Tsunami warning system in detail.
14.	a) Discuss in detail the gravity analysis by Worden gravimeter. (10) b) Distinguish between body waves and surface waves. (10)
	SECTION E – K6 (CO5)
	Answer any ONE of the following (1 x 20 = 20)
15.	Describe the various sources of contamination for groundwater in Chennai district.
16.	a) Classify the layers of the atmosphere. (10) b) Write a short note on "heat transport and internal temperature" inside the earth. (10)

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