Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2021

Course: Geological and Geophysical Methods of Exploration **Semester: III**
Program: B. Tech APE (UP) **Time 03 hrs.**
Course Code: PEGS 2035 **Max. Marks: 100**

SECTION A [5x4=20marks]

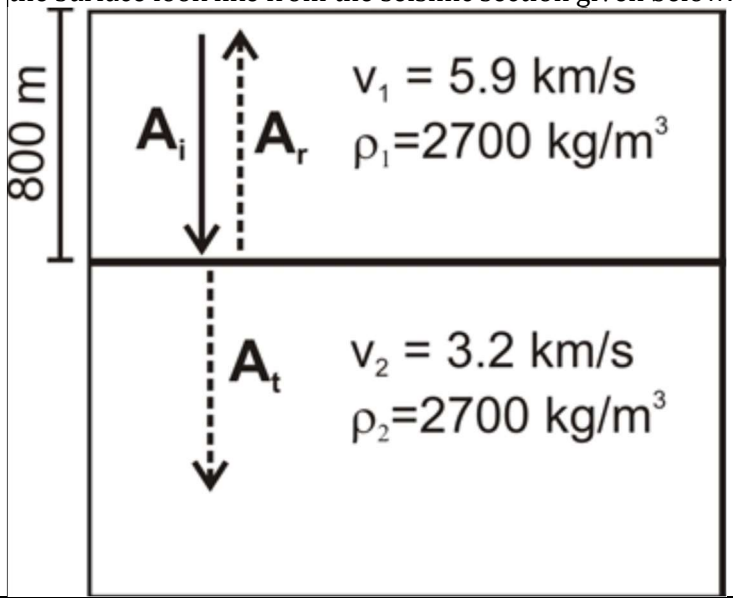
1. **Each Question will carry 4 Marks**
2. **Instruction: Complete the statement / fill the correct answer(s)**

S. No.	**Question**	**CO**
Q 1	List out the controlling factors of petroleum generation in source rock.	**CO1**
Q2	What are the applications Bouguer anomaly and Free Air anomaly in hydrocarbon prospecting	**CO1**
Q3	List out the different physical properties being calculated in data analysis from gravity, magnetic and seismic survey	**CO2**
Q4	(a) The … (Sandstone/Carbonate/igneous/Metamorphic) rocks form the most dominant reservoir in the world (b) Kerogen Type III can produce……. (oil/gas/both). (c) If TOC is > 4%, the source potential is considered as….. (poor/fair/good/excellent). (d) Metagenesis process occurs in the temperature range of (< 50, 50-200,200-250, >250) degree Celsius	**CO2**
Q5	What is NMO/AVO analysis in seismic data interpretation?	**CO2**

SECTION B [4x10=40marks]

1. **Each question will carry 10 marks**
2. **Instruction: Write short / brief notes**

Q 6	Analyse the controlling factors for petroleum generation during the stages of diagenesis, catagenesis and metagenesis.	CO3
Q 7	Discuss petroleum trap system with proper diagram.	**CO3**

Q 8	Evaluate the key parameters required to be to assessed for the possible hydrocarbon source rock evaluation	**CO4**
Q 9	Discuss all the steps in seismic techniques for petroleum exploration **OR** What is zoeppritz equations for reflection at normal incidence? Estimate the seismic record at the surface look like from the seismic section given below.  	**CO4**

Section C [2x20=40marks]

1. **Each question will carry 20 marks**
2. **Instruction: Write long answer.**

Q10	(a) What is laterolog resistivity? Describe the difference between "LLS" and "LLD" in resistivity log. (b) Evaluate the various types of well logs available for measurement of formation properties **OR** Evaluate in detail on reservoir properties namely, porosity, permeability and fluid content. What are the various lab methods of determining oil, gas and water saturation level from hydrocarbon bearing formation?	**CO5**
Q11	Estimate the source rock potential, kerogen type and maturity of a shale rock with Suitable sketch diagram	**CO6**