Name: Enrolment No:	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
Online End Semester Examination, December 2020

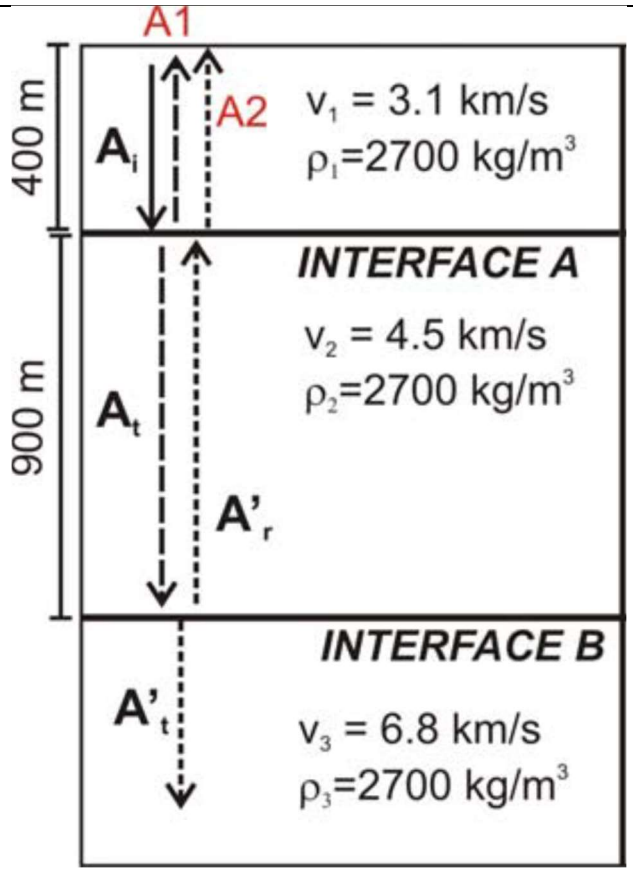
Course Name: Geological & Geophysical Methods of Exploration **Semester: V**
Programme Name: B. Tech APE-U **Time: 03 hrs**
Course Code: PEGS 3016 **Max. Marks: 100**

SECTION A (30 M)

1. **Each question will carry 5 Marks**
2. **Instruction: Contains MCQ, T/F and short answer only**

S.No.	Questions	Marks	CO
Q 1	A Magnetic field measurement is done in the unit of I. milligal II. nanotesla III. milli second IV. micro second	**05 (5x1)**	**CO3**
	B Gravitational field is maximum at I. equator II. pole III. both at pole and equator IV. somewhere else		
	C Magnetic surveying method is used in hydrocarbon study for mapping of I. depth of reservoir II. thickness of reservoir III. basement of reservoir		
	D Which property is measured in data analysis of magnetic exploration? I. Magnetic susceptibility (k) II. Remnant magnetization (M) III. Both k and M		
	E Magnetic survey can be performed by I. Airborne II. Shipborne III. Ground based IV. All		
Q 2	A Diurnal variation correction is done during the survey of I. Gravity II. Magnetic III. Seismic	**05 (5x1)**	**CO1**
	B The gravitational force between two mass of distance "r" is proportional to I. r		

	II. r^2 (r square) III. 1/r IV. $1/r^2$ (r square)		
	C Gravity measurements carried out below the reference level will need: I. Subtract Free Air correction , add bouguer correction II. subtract Bouguer correction , add free air correction III. Add Bouguer correction, add Free Air correction IV. None		
	D Half width gravity formula is primarily used to find the I. Vertical depth of formation II. Reservoir thickness III. Mass of reservoir		
	E Bouguer anomaly and free air anomaly are applied respectively in I. Ocean and Land II. Land and Ocean III. Land and mountain IV. Mountain and valley		
Q 3	Write True/ False i) NMO stands for Normal Move Out **(T/F)** ii) P -wave velocity is proportional to porosity of formation **(T/F)** iii) Poisson's ratio is the ratio of longitudinal to tangential strain **(T/F)** iv) In AVO analysis, amplitude is independent to Poisson's ratio **(T/F)** v) Acoustic impedance depends on density and velocity of formation **(T/F)**	**05 (5x1)**	**CO1**
Q 4	List significance of micro and macro seepages in new petroleum prospect identification.	**05**	**CO1**
Q 5	Explain how the geological factors control the reservoir quality.	**05**	**CO3**
Q6	List the significance of Geochemical methods for petroleum exploration	**05**	**CO1**
SCETION B (50 M) **1. Each question will carry 10 Marks** **2. Instruction: Write short note**			
Q 7	Explain the process of carrying out time correction for static or velocity analysis in seismic survey	**10**	**CO4**
Q 8	Explain the concept of migration of seismic trace in dipping bed. List out the merits/demerits of Post-stacking depth migration vs Pre-Stacking depth migration	**10**	**CO4**
Q 9	Describe in detail the procedure of geological mapping in a region	**10**	**CO3**
Q 10	Illustrate secondary migration and accumulation of hydrocarbons in a system	**10**	**CO1**
Q 11	Describe the general scheme of petroleum formation. **OR** Evaluate the amplitude and arrival time of reflected waves (A1, A2) coming as signal from a normal incidence as per given diagram, Assume initial amplitude of incidence wave is 1	**10**	**CO3**

Section C (20 Marks)

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

Q 12	Give an overview of Geophysical methods in Petroleum Engineering. Evaluate the various applications of geophysical methods in Hydrocarbon exploration **OR** Explain: a) Effect on porosity of grain size under Unconsolidated sediments vs consolidated sediments condition. b) For clay-free sands, the reduction in porosity with increasing sorting coefficient is greater for coarse sand than for fine sand. c) Post burial changes in porosity.	**20 (10+10)** **20 (6+7+7)**	**CO5**