Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Term Examination, December 2022

Programme Name: B.Tech APE UP **Semester : III**
Course Name : Introduction to Petroleum Operations **Time : 3 hr**
Course Code : PEAU2011 **Max. Marks: 100**
Nos. of page(s) : 2
Instructions: a) Answer the questions in sequence.
b) Draw the diagrams wherever necessary.

SECTION A (Attempt all questions)

S. No.		Marks	CO
Q1.	A natural gas has the following composition by volume at a temperature of 80˚F and a gauge pressure of 40 psig—87.2% methane, 4.5% ethane, 3.6% propane, 1.8% n-butane, 1.0% isobutene, and 1.9% nitrogen. Assuming the ideal-gas law is applicable, calculate (i) the average molecular weight of the mixture, (ii) density of the natural gas, (iii) specific gravity of the gas, (iv) volume occupied by 100 lb of gas at 1 atm and 60◦F, (v) partial pressure of nitrogen, and (vi) pure-component volume of nitrogen per 1,000 ft^3 of gas.	**12M**	**CO1**
Q2.	Explain the following in detail a) Blow out preventer b) Swivel c) Drill collar d) Functions of drilling mud	**(4x3) 12M**	**CO2**
Q3.	Illustrate self-potential log with reference to principle, shape of SP curves, interpretations and applications.	**12M**	**CO3**
Q4.	a) Write a short note on core analysis and components of wire line logging. b) Given the following data on a core sample, compute the porosity and the oil, water and gas saturations. Sample weight as received from the field=53.50 gm, water volume recovered during extraction=1.50 cc, sample weight after extracting and drying=51.05 gm, density of core oil=0.85 gm/cc, bulk volume of sample=23.60 cc, grain density of sample=2.63 gm/cc.	**(6+6) 12M**	**CO3**

Q5.	a) What do you mean by Gas lift? Discuss in detail with neat sketch. b) List the flow meters available for gas metering and explain any one of them in detail.	**(6+6) 12M**	**CO4 & CO5**
SECTION B **(Attempt all questions)**			
Q6.	a) Briefly explain Hydraulic fracturing and Matrix acidizing b) Write the types of separators used in oil industry and explain horizontal separator and its components with a neat diagram.	**(10+10) 20M**	**CO4**
Q7.	a) Removal of salt from crude oil for refinery feedstocks is mandatory. Explain the electric desalting method and the major parameters considered when designing the desalting system. b) What are the various methods involved in the removal of water vapor from the gas? Describe the glycol dehydration method in detail with a neat sketch.	**(10+10) 20M**	**CO5**