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

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

Course: Introduction to Petroleum Operations **Semester: III**
Program: B. Tech. APE UP **Time 03 hrs.**
Course Code: PEAU 2002 **Max. Marks: 100**

SECTION A

1. **Each Question will carry 5 Marks**
2. **Each Sub-Question consisting of MCQ, FIB, MA and TF will carry 1 Mark.**
3. **Instruction: Complete the statement / Select the correct answer(s)**

S. No.	**Question**	**CO**
Q 1	i) Sealing behaviour of a fault is constant along the fault-plane a) True b) False ii) In differential entrapment the heaviest fluid (water) being trapped in the highest anticline and the lightest (gas) in the lowest a) True b) False iii) Which one is not a resistant force to secondary hydrocarbon migration in a reservoir a) Reservoir lithology b) Capillary pressure c) Radius of the pore throats of the rock d) Hydrocarbon-water interfacial tension iv) Migration from one reservoir system position through an intervening section into another reservoir position (trap) in the same or a different reservoir is known as a) Secondary migration b) Primary migration c) Re-migration d) Tertiary migration v) which one is not correct for the hydrocarbon sweep a) Vertical migration b) Macro and micro seeps c) Imperfect sealing leads seepage d) Always indicative of hydrocarbon presence	**CO1**
Q2	i) Sweet gas if H_2S a) More than 10 ppmv and less than 100ppmv b) less than 10 ppmv c) More than 100 ppmv and less than 1000ppmv d) None ii) Which is not a function of an oil facility a) to produce the oil & gas from a well b) treat the oil to meet sales specifications c) measure and sample the oil to determine its value d) and deliver it to the transportation system iii) The separation of crude oil by distillation is a Chemical based on the fact that different chemical compounds have different boiling points a) True b) False	**CO4**

	iv) A continuous gas lift operation is a unsteady-state flow of the aerated fluid from the bottom (or near bottom) of the well to the surface a) True b) False v) Liquefied Petroleum Gas (LPG) mainly contains____ a) Methane b) Methane & Ethane c) Butane & Propane d) Methane & propane _____	
Q 3	i) Natural radioactivity is usually highest in basic igneous rocks, intermediate in metamorphic rocks and lowest in sedimentary rocks a) True b) False ii) Dense, low porosity rocks are characterized by high velocity of sound wave and vise-versa for porous and less dense formation a) True b) False iii) An oil that is at a pressure above its bubble-point pressure is called an ‘‘_____’’ because it can dissolve more gas at the given temperature. a) Saturated Oil b) Undersaturated Oil c) Condensate d) None iv) A steady-state flow condition can prevail in a edge-water drive reservoir for a long time before water breakthrough into the well a) True b) False v) Gas wells are wells with producing GOR _____ a) Greater than 100,000 scf/stb b) Between 50000 scf/stb and 100,000 scf/stb c) Between 10,000 scf/stb and 5000 scf/stb d) Less than 5000 scf/stb	**CO3**
Q 4	i) Development wells are used to assess characteristics (such as flow rate) of a proven hydrocarbon accumulation a) True b) False ii) Wells having a bore with a straight section, a build section, a tangent section and a drop section is _____ profile a) Vertical / straight b) Build- Hold (J type or slant) c) Build- Hold- Drop (S type) d) Directional Well iii) __Short Radius_____wells make possible a build-up rates ranging between 30° and 60° every m and therefore has the possibility to arrive to the horizontal section in less than 3 m iv) Which one is not a function of Functions of drilling fluids a) Lifting the cuttings from the bottom of the hole and transport to the surface b) Control sub-surface pressures c) Control sub-surface temperature	**CO2**

	d) Cool & lubricate bit and drill string v) Yield Point_____is used to evaluate the ability of mud to lift cuttings out of the annulus.	
Q5	i) The difference in "g" between equator & poles is approximately--------cm/sec^2 a) 8 b) 10 c) 5 d) 3 ii) The Bouguer anomaly over an isostatically compensated region is : a) Zero b) Positive c) Negative d) Same as isostatic anomaly iii) In ----------substances the magnetic susceptibilities are SMALL and POSITIVE and depends linearly on the applied field and reduces to zero on removal of the field a) Paramagnetic b) Diamagnetic c) Ferromagnetic iv) Magnetic readings taken at the same location at different times will yield the same results__ a) True b) False__ v) Gravity lows (positive anomalies) occur where rocks in the subsurface have a comparatively high density, which reduces their downward gravitational pull a) True b) False	**CO1**
Q6	i) Hole diameter larger than bit size indicates that a) Unconsolidated sands, gravels and brittle shales b) Swelling shales c) Porous permeable sandstone d) Metamorphic Rocks ii) Drill-stem tests are usually use to determine: a) Formation permeability b) Formation pressures c) Fluid type (oil and water), and gas recovery from formation. d) All iii) Hydrocarbon Saturation is Fraction of pore volume filled with hydrocarbons i.e (Vw /Vf) a) True b) False iv) Formation water salinity/resistivity (Rw) can be determined by using a) Resistivity- Gamma-Porosity logs-Formation Tester b) SP-Caliper- Porosity logs-Formation Tester c) SP-Gamma-Resistivity - Porosity logs-Formation Tester d) SP-Resistivity - Porosity logs-Formation Tester v) Which one is characteristic of Oil bearing layer based on a) Low resistivity + Good porosity	**CO3**

	b) High resistivity + Good porosity c) High resistivity + Very low Øn + Lower ρb d) High resistivity + Low porosity	
SECTION B **1. Each question will carry 10 marks** **2. Instruction: Write short / brief notes**		
Q 7	Define Gravity and Magnetic anomalies. How the geological Interpretation of Gravity Data helps in petroleum exploration.	**CO1**
Q 8	What is a petroleum system? Describe the five elements of a conventional hydrocarbon accumulation	**CO1**
Q 9	With a schematic diagram, depict the various parts and components of a drilling rig. OR What are the functions of drilling fluids? How the well bore stability is maintained.	**CO2**
Q 10	Attempt any two from following:- a) Diagram depicting Components of a drill string. b) Conventional core analysis c) Types of drilling Bits application of PDC bits.	**CO2**
Q 11	Write very short notes on any **5** from followings:- a) Composition of Crude Oil b) Uses of Caliper logs c) Nuclear Logs d) Well Head & Casing Head e) Function of Christmas Tree f) Different Modes of Artificial Lift g) Oil Treating facilities **OR** Define Well Stimulation. What are the technical advantages and disadvantages of different methods of Well Stimulation**.**	**CO3**
Section C **1. Each Question carries 20 Marks.** **2. Instruction: Write long answer.**		
Q 12	Give a detailed account of Oil and Gas activities of different streams with a flow chart and highlighting major activities. **OR** Describe in detail any **Two** from following a) Fractional distillation of Crude oil? b) What are different modes of transportation of oil & gas. c) Supply chain of petroleum and supply chain of petroleum industry in India.	**CO4**