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Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2021

Programme Name: APE Gas	Semester : VII
Course Name : Production Engineering - II	Time : 03 hrs
Course Code : PEAU 4013P	Max. Marks : 100
Nos. of page(s) : 2	

Instructions: 1. Assume any data missing.
2. Attach any graphs and/or data sheets (if any) used to the answer sheets for evaluation

S.No	SECTION A (5*4=20M)	Marks	CO
Q 1	Explain any one method to evaluate well productivity.	4	CO1
Q 2	List various reasons of water production through the wellbore?	4	CO1
Q 3	Describe the 'ideal counterbalance effect' in SRP system.	4	CO2
Q 4	List the components of gas lift valve and classify the gas lift valves	4	CO3
Q 5	What is scale? Write the reasons for scale deposition problem in the well bore.	4	CO4
SECTION B (4*10=40M)			
Q 6	A well producing from a pay zone between 5000 to 5052 ft is completed with 2 7/8" tubing hung at 5000 ft. The well has a bottom-hole static pressure of 2000 psi and a productivity index of 0.3 bbl/day/psi and produces with a gas/oil ratio of 300 cu.ft/bbl and a water cut of 10%. At <i>what rate</i> will the well flow with a tubing-head pressure of 100 psi.	10	CO1
Q 7	Assume suitable data, draw the schematic graph and explain the graphical method to determine the depth for multipoint of gas injection, in intermittent gas lift.	10	CO2
Q 8	Draw the schematic sketch of surface and subsurface layout of Electrical Submersible Pumping its merits, demerits. Also explain the working of pump, protector, electrical components, gas separator etc. in it.	10	CO3
Q 9	From the following data of continuous gas lift well, <i>Space the valves using Graphical or analytical procedure:</i> Depth to mid perforations = 7500 ft; Oil gravity = 35 ^o API; Gas gravity = 0.65; injected gas surface temperature = 100 ^o F; Water fraction = 0; Formation GOR = 200 scf/STB; Flowing well head pressure = 100 psi (280 available); T _{wh} = 100 ^o F; Tubing I.D. = 1.995 in.; Surface operating pressure = 870 psi; Kickoff pressure = 920 psi; Reservoir Temperature = 182 ^o F; Load fluid gradient = 0.5 psi/ft; static liquid level is at surface; Desired production rate = 600 STB oil/day; From a previous test: P _R = 2000 pso; q _o = 383 STB/day for P _{wf} = 1850 psi.	10	CO4
SECTION-C (2*20=40M)			
Q 10	A 7500-ft-deep well produces 35 ^o API oil with GOR 200 scf/stb and zero water cut through a 1.995 -in. ID tubing in a 7-in. casing. The oil has a formation volume factor of 1.25 and average viscosity of 5 cp. Gas-specific gravity is 0.65. The surface and bottom-hole temperatures are 100 ^o F and 182 ^o F, respectively. A test projected a reservoir pressure 2000 psia and a oil production rate of 383 STB/day for P _{wf} = 1850 psi with the IPR of the well described by the Vogel model. If the well is to be put in production with an ESP to	20	CO4

	produce oil at 600 stb/day against a flowing wellhead pressure of 100 psia. <i>Determine the required specifications for an ESP for this application.</i>		
Q 11	<p>a) Write the various suitable parameters and situation in which you will select PCP, Jet Pump and ESP. (10 Marks)</p> <p>b) Explain the working principle and operation cycle of 'plunger assisted gas lift system'. (10 Marks)</p>	20	CO3