

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: PTEG 321 Production Engineering I

Semester: V

Program: APE V(Upstream)

Time: 03 hrs.

Max. Marks: 100

Instructions: Read instruction of each section carefully and give precise answers.

SECTION A

MARKS 20 5*4

All questions are compulsory

S. No.	Question	Marks	CO
Q 1	What is the Function of tubing hanger?	4	CO 1
Q 2	What is open,,semiclosed and closed installation of gas lift? Draw relevant sketch.	4	CO 4
Q 3	What is temperature correction factor for dome type gas lift valve.? Give relevant equation.	4	CO 4
Q 4	What is PI and its significance?	4	CO 2
Q 5	What is rigless and with rig well intervention? How paraffin and asphaltene is removed in well intervention?	4	CO 5,6

SECTION B

MARKS 40 4*10

Q. 6, 7, 8 are compulsory. Do any one out of 9 and 10

Q 6	a) List downhole components of ESP. Write design procedure of ESP b) List surface components of PCP. Write design procedure of PCP.	5 5	CO 4
Q 7	a) Write Ros co-relation. Write stepwise procedure for calculation of tubing head pressure if bottomhole pressure is known. b) Discuss formation sand size analysis. What is its importance in designing gravel pack?	5 5	CO 1,4
Q 8	a) What are load bearing solids in sand stone formation? What are different methods of sand control? b) Write different co-relations for calculating G-S ratio. What is uniformity coefficient and its effect on gravel pack permeability ratio?	5 5	CO 5,6
Q 9	a) Discuss nodal analysis giving suitable example. b) Write Gilbert's formula for choke performance. Why there is a temperature drop across choke? Write relevant formula.	5 5	CO 5,6
Q 10	a) What is peak polished rod load, minimum polished rod load, pump displacement,	5	CO 4

	<p>polished rod horse power and peak torque in a sucker rod pump. How peak polished rod load peak is calculated.</p> <p>b) What are different types of downhole pumps in SRP? Explain one of them with relevant sketch.</p>	5	
SECTION-C		MARKS 40 2*20	
Question number 11 is compulsory. Attempt any one out of Q12 and 13			
Q 11	<p>(a) What is static level and dynamic level in artificial lift? What is their significance while designing any type of lift?</p> <p>(b) What are velocity numbers in multiphase flow? What is their significance?</p>	10 10	CO3, 4
Q 12	<p>(a) For a flowing well, if gas density and well depth is given then how bottom hole flowing pressure is calculated? Give relevant equation.</p> <p>(b) A flowing well with 3000 ft. of tubing in the hole. When casing pressure is 550 psig its production rate is 42.bbl/day. When casing pressure is 320 psig then the production rate is 66 bbl./day. What is the productivity index of this well? Calculate static pressure of the well, and its potential? Assume straight line IPR</p>	10 10	CO 2
Q 13	<p>(a) Pressure gradient equation for single phase incompressible fluid is given below</p> $-144 \frac{dp}{dl} = \frac{g}{gc} [\rho \sin \theta] + \frac{f \rho v^2}{2gc d} + \rho \frac{vdv}{gc \alpha dl}$ <p>In this equation, total pressure gradient is sum of three principal components. Discuss them.</p> <p>(b) Transform the above equation in to multiphase equation giving detailed process.</p>	10 10	CO 3