Name:

Enrolment No:

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

END Semester Examination, May 2024

Course : Formation Evaluation and Well Testing
Programme : B.Tech., APE GAS
Course Code : PEAU 3036
Nos. of page(s) : 1

Semester : VI
Time : 03 hrs
Max. Marks : 100

Instructions: *Assume any data missing*

SNo	SECTION A (5Qx4M=20Marks)	Marks	CO
Q 1	Define Radius of Investigation.	4	CO1
Q 2	Define Hydraulic Diffusivity.	4	CO1
Q 3	List various uses of the drawdown test data.	4	CO1
Q 4	Mention various types of gas well tests.	4	CO2
Q 5	Mention various uses of caliper log.	4	CO3
	SECTION B (4Qx10M= 40 Marks)		
Q 6	A well located in a reservoir of 4000 ft is producing oil at a constant rate of 30.8 RB/day. The following is the data describing well and formation: μ_o = 1.08cp; *Bo* = 1.475 RB/STB; *k* = 0.15 md; C_t = 1.5*10^{-5}/psi; r_w = 0.5ft; r_e = 3000ft; *h* = 150ft; Φ = 0.23; P_i = 3000psi; *S*=0. Calculate the reservoir pressure at a radius of 3 ft after 27 hours of production.	10	CO2
Q 7	A Flow-After-Flow test in a gas well reported the following data. P_{wf} (psig): 403, 394, 379, 363 q_g (MMscf/D: 4.288, 9.265, 14.552, 20.177 At each rate, pseudo-steady state was reached. Initial shut-in bottom hole pressure was determined to be 408 psi. Estimate the Absolute Flow Potential (AOF) of the tested well using the *empirical method*.	10	CO3
Q 8	Explain with neat diagram the working of any resistivity log. **or** A sonic log run through consolidated sandstone (with Vma = 18000 ft/s) filled with fresh water (with transit time of 192.3 μs/ft) recorded a transit time of 86 μs/ft. Estimate the porosity of sandstone.	10	CO4
Q 9	Explain with neat diagram the working of Neutron log. **or** A hydrocarbon-bearing calcite formation (hydrocarbon density is 0.85 g/cc and calcite density is 2.71 g/cc) is invaded with mud filtrate of density 1.05 g/cc and its saturation is 82%. Estimate the porosity of the formation if the formation density tool records a formation bulk density of 2.27 g/cc.	10	CO5
	SECTION-C (2Qx20M=40 Marks)		
Q10	Provide your analysis about the SP log by writing down the electro-chemical and electro-kinetic interactions of ions contributing to individual as well as the combined Spontaneous Potential (SP) in the formation with high salinity than the drilling mud. Draw a neat diagram for the same.	20	CO4
Q11	a. Describe the processes of gamma ray scattering and absorption. b. Based your understanding select and explain the type of log working on the principle of natural gamma radiation emanating from a formation.	20	CO5