

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, May 2019

Programme Name: M.Tech Petroleum Engineering
Course Name: Formation Evaluation and Well Logging
Course Code: PEAU 7005
Nos. of page(s) 2

Semester: 2nd
Time 03 hrs.
Max. Marks: 100

SECTION A

Attempt all questions

Maximum 60 words for each answer

S. No.		Marks	CO
Q 1	What is the reason behind Bell Shaped or Funnel shaped Spontaneous Potential (SP) curve seen on some thick reservoir.	5	CO3
Q.2	State the applications of drilling fluid in well logging. Define Transit Time.	5	CO2
Q.4	Write the applications of Neutron –Density cross plot analysis.	5	CO5
Q.3	Calculate minimum shaliness from Grlog =40 , Grmin =20 , Grmax =100 ,Phin = 30% , PhiNsh = 45% . PhiD =25% , PhiDsh = 20% ,PSP = -60mv and SSP = - 80 mv?	5	CO1

SECTION B

Q4 is compulsory, attempt any three from Q5 to Q8

Maximum 200words for each answer

Q.4	Write short Notes on any three I- LWD II- Sonic Porosity III- Archie's Equations	10 (4+6)	CO1
Q.5	What is induction logging? Describe modern induction tools with the help of induction up-hole processing.	10 (5+5)	CO2
Q.6	What is spectral gamma ray logging? Explain the Gamma Ray primary interaction with atom.	10 (4+6)	CO4
Q.7	Explain invasion of resistivity profile in water bearing and oil-bearing zones by using oil base mud. Please draw appropriate diagrams to explain.	10(5+5)	CO3
Q.8	What is Spontaneous Potential? What causes the SP voltage? Explain applications of SP Log and effect of bed thickness on SP.	10(3+3+4)	CO4

SECTION-C

Attempt any two questions

Maximum 500 words

Q.9	Describe coring in well logging. How do we handle and preserve it? Differentiate conventional and sidewall coring methods. Explain various data obtain from core analysis.	20 (4+4+8+4)	CO1
Q.10	Explain the process of Shaly Sand analysis and its different steps, each step should be accomplished in specific order. Determine the effective water saturation (Sw) with the help	20 (4+8+4+4)	CO3

	of various methods.)	
Q.11	<p>(a) In a clean hydrocarbon-bearing sandstone formation, the neutron and density logs read 10 and 38 sandstone porosity units, respectively. The shallowest resistivity reading is 10 ohm-m across the hydrocarbon-bearing formation and the resistivity of mud filtrate at the temperature of the formation is 0.075 Ohm-m. The residual hydrocarbon saturation in the flushed zone is 0.65. What is the in situ hydrocarbon density? Estimate the effective porosity of the formation. Assume that $a=0.81$, m and $n = 2$ in Archie's equation.</p> <p>(b) Calculate the porosity and oil saturation if Bulk density, matrix density and fluid density is observed from a well : 2.5 gm/cc, 2.7 gm/cc and 0.95 gm/cc respectively. $m=2$, $n=2$, $a=1$, $R_w = 0.08$ ohmm and $R_t = 150$ ohmm.</p>	<p>20 (10+10)</p>	CO5