

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Junen2021

Course: M. Tech Petroleum Engineering
Programme: Formation Evaluation and Well Logging
Time: 03 hrs.

Semester: II
Course code: PEAU7005
Max. Marks: 100

Instructions: Students will attach the interpreted log image (fig 1,2) along with answer sheet.

S. No.	Each question 5 marks, all questions are compulsory	Mark	CO
Q 1	Fill in the blanks. (i) If the saturation exponent in Archie's Equation is 2 ($n=2$). Then By what factor _____ the bulk resistivity of 50 % water saturated formation increases in comparison to fully water saturated formation. (ii) When the density neutron log is recorded with a photo electric curve, it is often called as..... (iii) SP log is usually run with....log.	5	CO1
Q 2	List the applications of NMR log	5	CO1
Q3	Write True or False. I. The spontaneous potential log measures the natural or spontaneous potential differences that exists between the borehole and the surface in the absence of any artificially applied current. II. SP can be recorded for water-base mud. III. Electro chemical potential is sum of Liquid junction and membrane potential. The greater the contrast in salinity between mud filtrate and formation water, the LESSER is the potential. IV. The mud filtrate is less saline then the formation water so it becomes negativity charge as a result of diffusion potential. V. SP log shows negative deflection to RIGHT and positive to the LEFT	5	CO2
Q4	Explain main differences between LLD, LLS and LLM	5	CO2
Q 5	In sand A, R_w is less than R_{mf} ; i.e., formation water is saltier than the mud filtrate. Is it true? justify your answer.	5	CO2
Q6	Mention the uses of SP log.	5	CO2

SECTION B

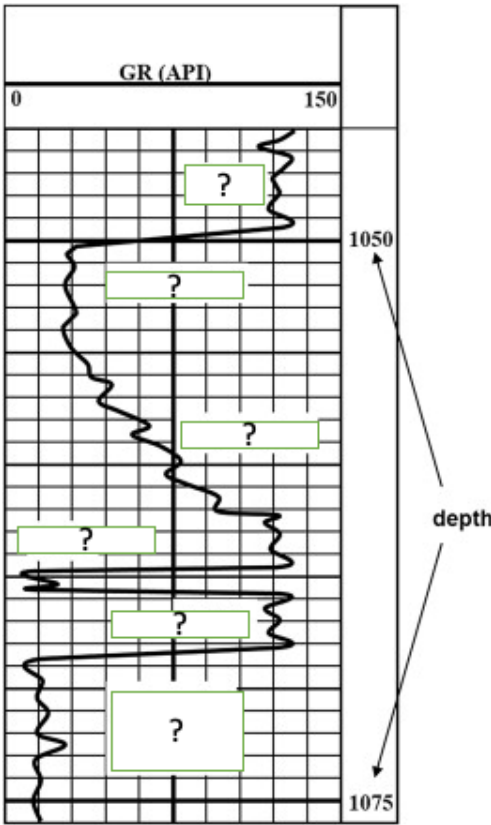
EACH QUESTION 10 MARKS [10X 5]

Q7	Describe Neutron log with reference to the principle, unit of measurement and application	10	CO3
Q8	Explain how to differential oil bearing and gas bearing zone using conventional logs.	10	CO3
Q9	Elaborate principle of resistivity log and its uses.	10	CO4
Q10	Explain the principle and application of production logging	10	CO4
Q11	Elaborate borehole environment and how it is importance for formation evaluation	10	CO5

OR

Q11	Find formation temperature at 7800ft, when bottom hole depth is 14,000ft; bottom hole temperature is 200°F; annual mean temperature is 80°F.	10	CO5
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SECTION C

Q12	<p>(i) Discuss about gamma ray sources.</p> <p>(ii) Explain about Natural gamma and Spectral gamma ray tools</p> <p>(iii) Calculate shale volume (marked with ?) in the following log profile.</p> 		CO6
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OR

Q 12 Refer the log image and answer the following questions:

Fig 1

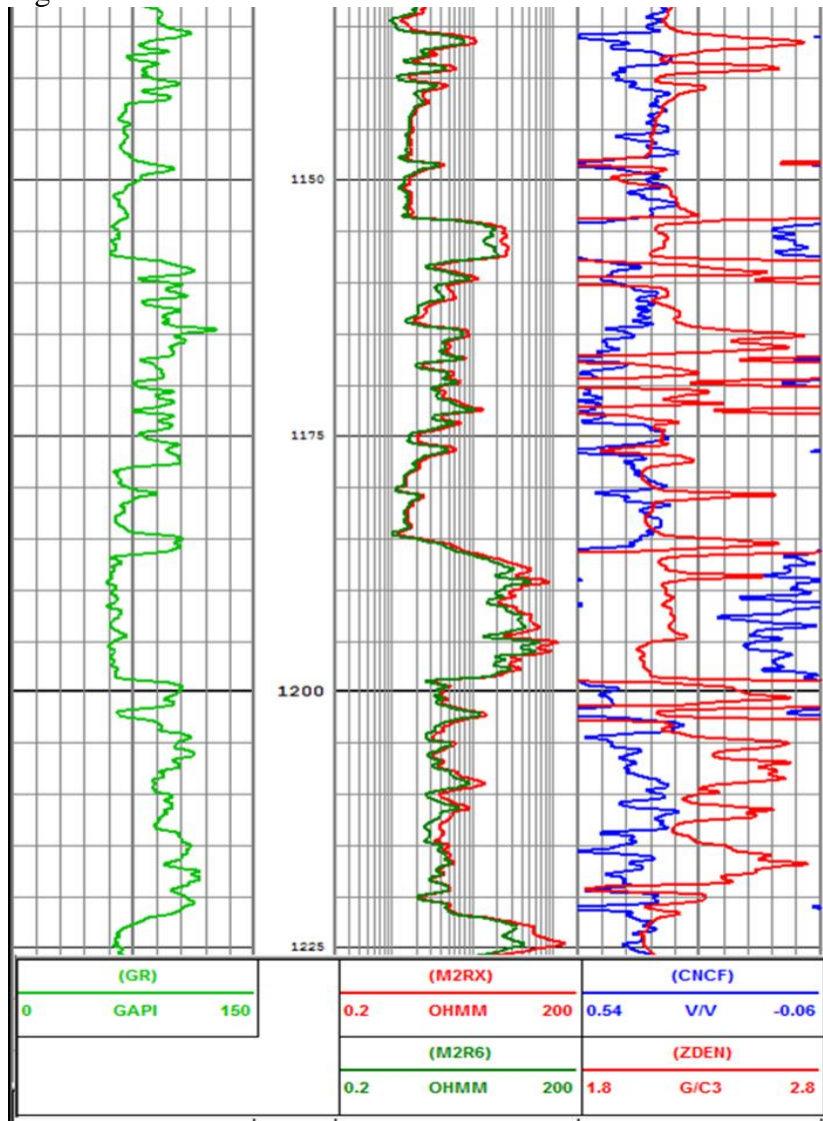


Fig 1

- a) Identify lithology and mark in the log section below.
- b) Interpret the hydrocarbon bearing zone and assess the reservoir quality based on shaliness

10+10=20

CO6