

Roll No: -----



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: B.Tech Applied Petroleum Engineering- upstream
Subject (Course): Unconventional Hydrocarbons Exploitation
Course Code : CEEG323
No. of page/s: 3

Semester – V
Max. Marks : 100
Duration : 3 Hrs

Instructions: Use of books, handouts, calculators is allowed but Cellphone, Internet, is NOT ALLOWED.

Section-A

Answer all questions (Select the correct answer(s) or write short answers)

[10X2=20]

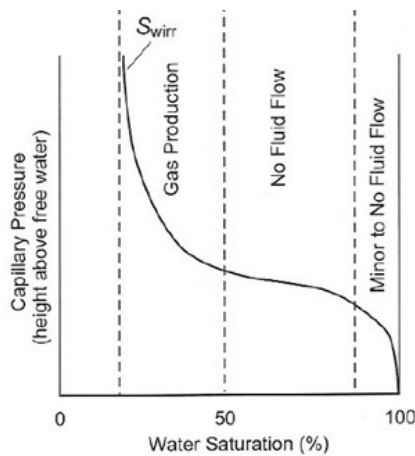
1. In a Langmuir Isotherm for Coal what is the meaning of Critical Desorption pressure?
2. In CHOPs method of Heavy Oil Production, what can happen if there is TOO LITTLE or TOO MUCH gas?
3. Even when SAGD method has been proven as the most efficient method so far for Heavy Oil production, when would the operator chose Huff-N-Puff method
4. What is the essential difference between Chevron CRUSH Technology and other technologies like Exxon Mobil's Electrofrac and Shell's ICP?
5. While hydraulic fracturing of shales reservoirs, the choice of the Fracking fluid (Slick water or Hybrid or Cross-linked) largely depends on the _____ of the Shale formation
6. Why is Natural Gamma Ray curve, an indicator of TOC (Total organic carbon)? Or What is the relationship between TOC and Natural Gamma Ray?
7. What are the key parameters for Shale Gas Reservoir evaluation? Just give the names of the parameters and indicate which ones are most important (No need for detailed description)
8. What are the main challenges for development of CBM in India? (Just write the challenges, no need for detailed descriptions)
9. The most promising Shale Gas reservoir in India is _____
10. What is the cause of finding Free Gas below Hydrates?

Section – B

Answer all questions (explain with diagram where relevant)

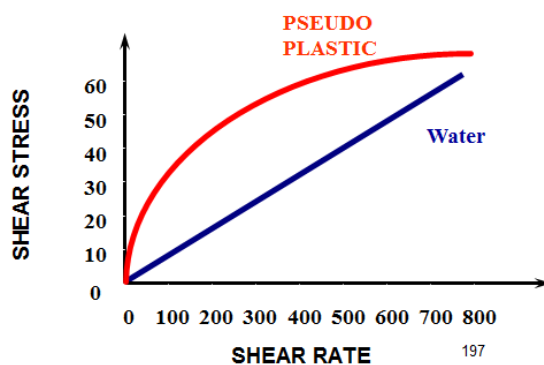
[5X8=40]

11. The Canadian states of Alberta and Saskatchewan contain Tar Sands and Heavy oil and deploy a range of different technologies for their production. Explain with diagrams (both Plan and Elevation) why different technologies are deployed in different areas
12. Using Simple Archie Equation, compute S_w for this Tight Gas Sand formation where $R_w=0.08$ ohmm, $R_t= 8$ ohmm, $\phi_D= 5\%$, $\phi_N=2\%$.



Given the concept of Permeability Jail, will there be any flow?

13. What are the differences between SAGD method used for Heavy Oil and CCR method used for Oil-Shales?
14. During Hydraulic Fracturing, chemicals and polymers are added to change the linear Newtonian behavior of water to Pseudo-plastic



What is the exact reason why such a change of fluid properties are desirable in Hydraulic Fracturing?

15. What are the advantages of CDX LLC method of Multilateral Drilling for CBM using the Pinnate method

Section – C

Answer all questions

[2x20=40]

16. Looking at the Table of Reserves for Unconventional Gases prepared by Rogner in 1996, compared to North America, Russia has large reserves of Coalbed Methane while China has large reserves of Shale Gas

Region	Coalbed Methane (Tcf)	Shale Gas (Tcf)	Tight-Sand Gas (Tcf)	Total (Tcf)
North America	3,017	3,840	1,371	8,228
Latin America	39	2,116	1,293	3,448
Western Europe	157	509	353	1,019
Central and Eastern Europe	118	39	78	235
Former Soviet Union	3,957	627	901	5,485
Middle East and North Africa	0	2,547	823	3,370
Sub-Saharan Africa	39	274	784	1,097
Centrally planned Asia and China	1,215	3,526	353	5,094
Pacific	470	2,312	705	3,487
Other Asia Pacific	0	313	549	862
South Asia	39	0	196	235
World	9,051	16,103	7,406	32,560

What could be the main reasons for lack of CBM gas production from Former Soviet Union?

What are the main reasons for lack of Shale Gas production from China?

17. Among different sources of Unconventional Oils, prepare a brief comparative summary in a Tabular form as shown below and thereafter comment which of the three Unconventional Oil resources holds the maximum promise for future giving reasons to support your answer

	Unconventional	Shale Oil	Tar Sands & Heavy Oil	Oil Shale
1	Reserves			
2	Global distribution			
3	Best Examples			
4	Main Technologies			
5	Challenges			