

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2024

Course: M. Sc Petroleum Geoscience

Semester: II

Programme: Coal bed methane and shale gas exploration

Course code: PEGS8036 P

Time: 03 hrs.

Max. Marks: 100

SECTION A [4X5=20marks]

S. No.		Mark	CO
Q 1	List five additives used in shale hydrofracturing.	4	CO2
Q 2	Discuss about shale types.	4	CO1
Q3	Mention five characteristics of a shale gas Reservoir	4	CO1
Q4	Explain the phases of coal bed methane formation	4	CO2
Q5	Classify the cleat systems in coals.	4	CO3

SECTION B [40 marks]

Q 6	Analyse the gas storage capacity in shale gas reservoirs and their flow patterns inside the reservoir.	10	CO4
Q7	Describe about different well types for enhanced CBM recovery.	10	CO3
Q8	Elaborate the controlling parameters of adsorbed gas in coal seams.	10	CO3
Q9	Explain the environmental concerns related to shale gas and CBM in India and worldwide.	10	CO4

OR

Q9	Analyze different views on geopolitics on shale gas exploration and energy security.	5+5=10	CO4
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SECTION-C [40 marks]

Q 10	A shale formation was characterized to assess the gas generation potential using Rock Eval Pyrolysis. Where the free gas released at initial temperature 440degree Celsius, S1 is 3 mg/g HC, pyrolyzed gas released is 3 mg/g HC, S3 is 2.6 mcCO ₂ /g Rock, TOC =4 %, Tmax is 468 degree, (a) Calculate the Hydrogen Index, Oxygen Index and Production Index for that shale. (b) Interpret the thermal maturity zone and kerogen types. (c) Evaluate the gas generation potential.	10+5+5=20	CO4, CO5
Q 11	(a) Illustrate about microbial CBM exploitation process. (b) Describe the laboratory techniques of coal characterization.	10+10=20	CO4

	OR		
Q 11	(a) Discuss generation processes of shale oil, oil shale and shale gas generation and the role of kerogen. (b) Analyse the advantages and challenges of hydraulic fracturing techniques in CBM exploitation.	10+10=20	CO4