

Name:			
Enrolment No:			
<b>UPES</b> <b>End Semester Examination, December 2023</b>			
Course: Sedimentology and Sequence Stratigraphy		Time : 03 hrs.	
Semester: 1 <sup>st</sup>		Max. Marks: 100	
Program: M.Sc. Petroleum Geoscience			
Course Code: PEGS 7006			
<b>Instructions:</b>			
<b>SECTION A (5Qx4M=20Marks)</b>			
SN		Marks	CO
Q 1	Define sedimentary texture and its role in reservoir analysis.	4	CO1
Q 2	Describe the significance of sequence stratigraphy in the context of hydrocarbon exploration.	4	CO1
Q 3	Explain the process of sediment transportation by water.	4	CO2
Q 4	<b>True or False:</b> (a) Clastic sedimentary rocks are formed from the accumulation and lithification of pre-existing rock fragments. (b) Well-sorting refers to the wide range of sediments with a variety of grain sizes. (c) Sequence stratigraphy is primarily used to study terrestrial environments and has limited application in marine settings. (d) Graded bedding is a sedimentary structure that indicates a change in current velocity or depositional energy over time.	4 (1 mark each)	CO2
Q 5	<b>True or False:</b> (e) Sedimentology is not relevant in understanding the Earth's past environments and climates. (f) Clastic sediments are composed of organic material, such as shells and plant remains. (g) Unconformities are important features in sequence stratigraphy and represent gaps in the geological record. (h) Sequence stratigraphy provides insights into the spatial and temporal distribution of sedimentary deposits, aiding in reservoir characterization for petroleum exploration.	4 (1 mark each)	CO2
<b>SECTION B (4Qx10M= 40 Marks)</b>			
Q 6	Explain the following in terms of depositional environment and reservoir quality. (a) Crevasse splays (b) Point bars	5+5	CO2
Q 7	Illustrate in detail the classification of limestone rocks suggested by Folk. Provide an overview of the key categories and their distinguishing characteristics.	10	CO4
Q 8	Draw an annotated diagram and explain Walther's law. Illustrate how it explains the relationships between sedimentary facies and the shifting of the depositional environment.	5+5	CO1

Q 9	Explain the process of Lithification and Diagenesis.	10	CO3
	OR		
	Explain the primary and secondary porosity and their role in reservoir quality assessment.		
<b>SECTION-C (2Qx20M=40 Marks)</b>			
Q 10	<p>(a) Draw a longitudinal profile of a river, mark its stages, and annotate various erosional, depositional landforms.</p> <p>(b) Prepare one cross-section profile in each stage and explain energy or river system using w/h ratio and landform development.</p> <p>(c) Explain the fluvial depositional environment with an emphasis on hydrocarbon reservoirs.</p>	7+6+7	CO3
Q 11	<p>(a) Draw and explain the formation process of stratal stacking patterns (Onlap, Offlap, Toplap and Downlap).</p> <p>(b) Draw and explain four different sediment stacking patterns of stratigraphy.</p> <p>(c) Explain how it provides insights into the depositional history and environmental conditions of a sedimentary basin.</p>	5+10+5	CO4
	OR		
	<p>(d) Differentiate between sequence boundaries and MFS.</p> <p>(e) Draw and explain, one cycle of sea-level change and associated depositional sequence, annotated by system tracts, and sequence boundaries with definition. Also, explain the causes of variation in sediment depositional style of different systems tracts (Draw an annotated diagram starting from HST to TST).</p> <p>(f) Correlate the formation of different petroleum system elements (Reservoir, Cap and Source rocks) during different stages of the relative sea level cycle.</p>		

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