Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – December 2025

Date: 20 / 12/ 2025 **Time: 09:30am – 12:30pm**

School: PSOE	**Program:** B.Tech. (PET)	
Course Code: PET2101	**Course Name:** Petroleum Geology	
Semester: III	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**
Marks	**2**	**2**	**24**	**24**	**24**	**24**

Instructions:

(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than roll number.

Part A

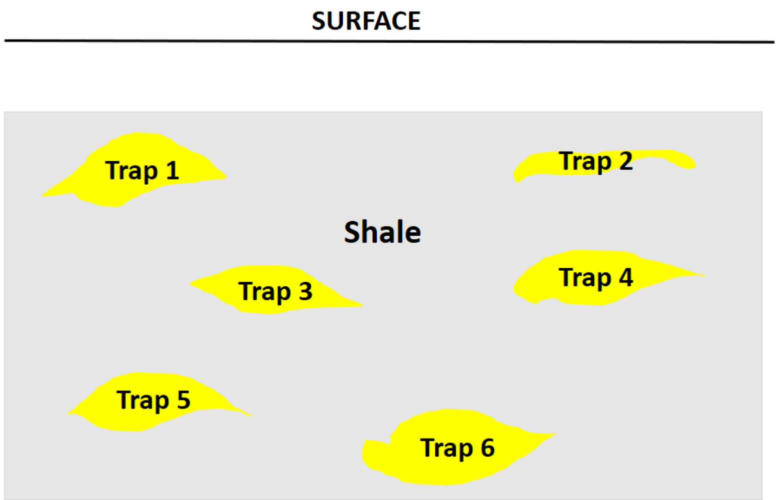
Answer ALL the Questions. Each question carries 2 marks. **10Q x 2M=20M**

1.	Recognize and fill in the blank with appropriate missing words: The word geology is derived from combining two Greek words, i.e., _________ and _________.	**2 Marks**	**L1**	**CO1**
2.	Select the correct option. The energy release during an earthquake originates from _________. a) Earth's atmosphere b) Focus (hypocenter) c) Volcano crater d) Earth's magnetic core	**2 Marks**	**L1**	**CO2**
3.	Describe petroleum geology as a branch of applied science.	**2 Marks**	**L1**	**CO3**
4.	Select the correct option. The most crucial factor a petroleum geologist interprets for hydrocarbon accumulation is _________. a) Plate boundaries b) Structural and stratigraphic traps c) Soil fertility d) Weathering processes	**2 Marks**	**L1**	**CO3**

5.	Recognize and fill in the blank with appropriate missing words: The oil window is generally between ________ and ________ °C.	**2 Marks**	**L1**	**CO4**
6.	Select the correct option. Migration ceases when hydrocarbons reach ________. a) Oil window b) Effective seal rock c) Source rock d) Overburden	**2 Marks**	**L1**	**CO4**
7.	Select the correct option. The main driver behind sedimentary basin formation is: a) Weathering b) Climate c) Plate tectonics d) Groundwater	**2 Marks**	**L1**	**CO5**
8.	Describe the importance of sedimentary basins in petroleum geology.	**2 Marks**	**L1**	**CO5**
9.	Recognize and fill in the blank with appropriate missing words: Estuaries develop where ________ rivers meet the ________ sea.	**2 Marks**	**L1**	**CO6**
10.	Define a siliciclastic shelf.	**2 Marks**	**L1**	**CO6**

Part B

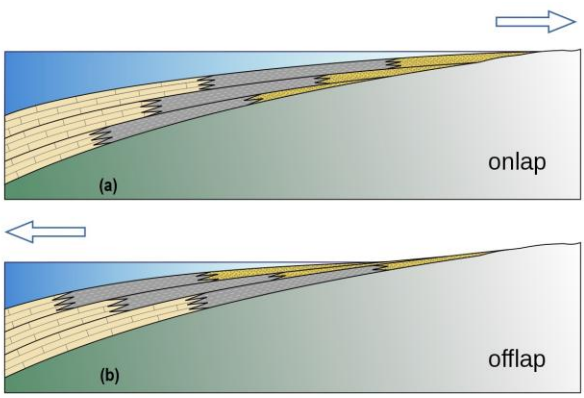
Answer the Questions. **Total Marks 80M**

11.	**a.**	Apply your understanding of structural and stratigraphic trapping mechanisms to identify the traps shown in Figure 1. Illustrate an economical drilling plan to maximize hydrocarbon recovery and justify the logic behind your proposed plan.  **Figure 1**	**2+4+4 Marks**	**L3**	**CO3**
	b.	Illustrate, with relevant geological reasoning, the conditions under which fractured igneous basement can act as a reservoir for petroleum.	**10 Marks**	**L3**	**CO3**
		Or			
12.	**a.**	Classify reservoir rocks and illustrate their main properties.	**10 Marks**	**L3**	**CO3**

	b.	Interpret the major difference between conventional and unconventional reservoirs.	**10 Marks**	**L3**	**CO3**

13.	**a.**	Illustrate the processes of secondary migration and its significance.	**10 Marks**	**L3**	**CO4**
	b.	Examine the concept of oil window and its significance in petroleum exploration.	**10 Marks**	**L3**	**CO4**
Or					
14.	**a.**	Examine the role of diapirism in hydrocarbon entrapment.	**10 Marks**	**L3**	**CO4**
	b.	Demonstrate with examples how spill point controls hydrocarbon accumulation.	**10 Marks**	**L3**	**CO4**

15.	**a.**	Differentiate the major controls on sedimentary basin formation - such as tectonics, thermal subsidence, and sediment loading - and analyze their combined influence using a labeled diagram.	**5+5 Marks**	**L4**	**CO5**
	b.	Analyze how plate-tectonic forces regulate sediment sources, basin architecture, and subsidence patterns, and interpret the Wilson Cycle in relation to these tectonic controls. Support your analysis with a schematic diagram.	**5+5 Marks**	**L4**	**CO5**
Or					
16.	**a.**	Examine the tectonic setting and spatial extent of India's sedimentary basins and classify them into DGH-reported hydrocarbon maturity categories, citing at least one example from each group.	**10 Marks**	**L4**	**CO5**
	b.	Analyze how growth-fault systems influence reservoir architecture and compartmentalization in syn-rift basins.	**10 Marks**	**L4**	**CO5**

17.	**a.**	Identify scientific reasons that make onshore sedimentary basins viable hydrocarbon targets, even though hydrocarbon-generating sediments originally accumulate in lakes and oceans.	**10 Marks**	**L4**	**CO6**
	b.	Examine the patterns shown in Figure I (a) and (b) and distinguish the two depositional geometries represented, interpreting their significance for shoreline migration.  Figure I	**5+5 Marks**	**L4**	**CO6**
Or					

18.	**a.**	Illustrate how shoreline migration through regression and transgression occurs over geological time and evaluate the core-based criteria used to distinguish between the two processes. Provide a schematic diagram to support your answer.	**4+4+2 Marks**	**L4**	**CO6**
	b.	Analyze the processes controlling sedimentation on siliciclastic continental shelves and slopes.	**10 Marks**	**L4**	**CO6**