

Roll No



**PRESIDENCY UNIVERSITY
BENGALURU**

**SCHOOL OF ENGINEERING
END TERM EXAMINATION - JUN 2023**

Semester : Semester II - 2022

Course Code : PET1001

Course Name : Sem II - PET1001 - Petroleum Geology

Program : PET

Date : 21-JUN-2023

Time : 1.00PM - 4.00PM

Max Marks : 100

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(10 X 2 = 20M)

1. List out at least two branches of General Geology. (CO1) [Knowledge]
2. Sequentially list down the necessary elements of any Petroleum System. (CO2) [Knowledge]
3. Define "Sedimentary Basin". (CO3) [Knowledge]
4. List the main controls on sediment supply and accommodation. (CO3) [Knowledge]
5. Sequentially list down the processes associated with any Petroleum System. (CO2) [Knowledge]
6. List out any two functions that any geomorphic agent serves in general. (CO1) [Knowledge]
7. Discuss "Accommodation Space" as a term of geology. (CO3) [Knowledge]
8. Define "Depositional Environment". (CO3) [Knowledge]
9. List any four of the major tectonic plates. (CO1) [Knowledge]
10. A few lithologies generally observed as cap rock are Salt, Anhydrite, Organic-rich Shales, Shales, Silty Shales, Calcareous Mudstones, and Cherts. Find out the most ductile and least ductile lithologies. (CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS

(4 X 10 = 40M)

11. The setting in which sediments are accumulated is called a depositional environment. Broadly, depositional environments can be said to be terrestrial, marine, or to reflect a transitional zone between the two. Terrestrial refers to depositional environments on land. These may be depositional environments such as deserts, found on dry land, but they could also be environments such as freshwater lakes or rivers. Marine refers to environments associated with saltwater seas and oceans. Transitional depositional environments include environments such as deltas, where freshwater rivers empty into saltwater seas or oceans.

- Identify the continental depositional environments from Figure F, and
- Briefly discuss all the continental depositional environments.

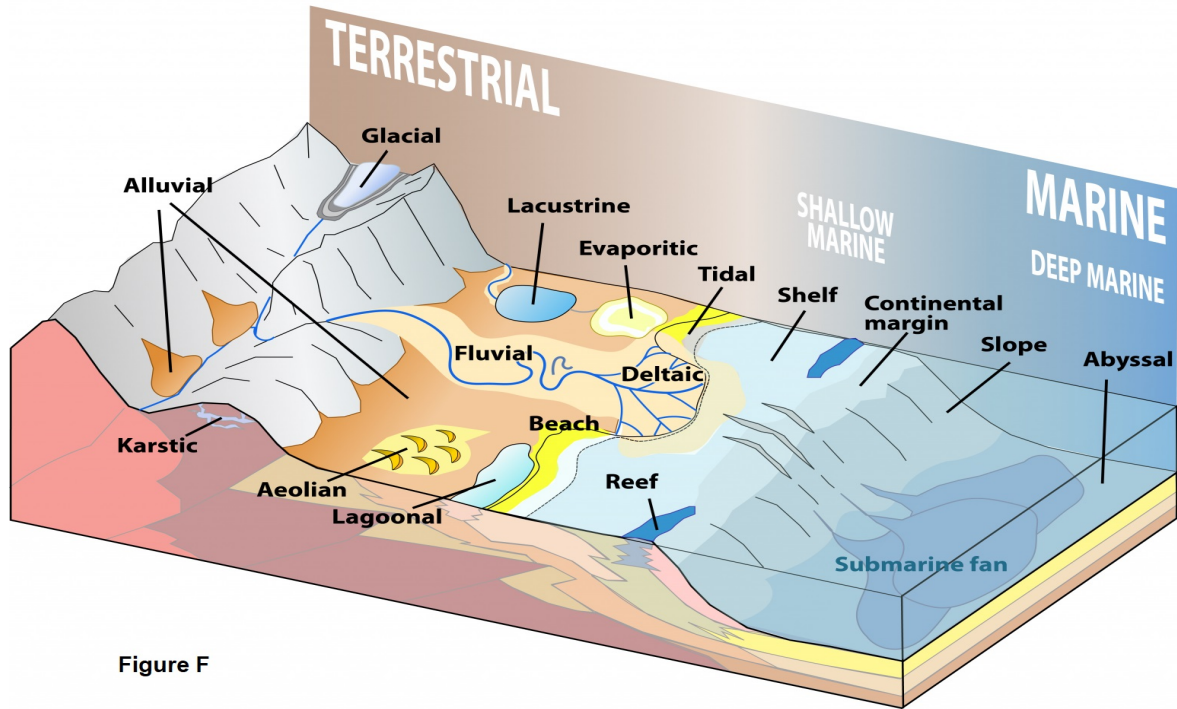


Figure F

(CO3) [Comprehension]

12. Figure E below portrays explains the formation of unconformity which sometimes acts as a petroleum trap. (a) Write the name of the unconformity shown with an arrow mark in Figure E4. (b) Explain the steps of unconformity formation as presented in Figure E.

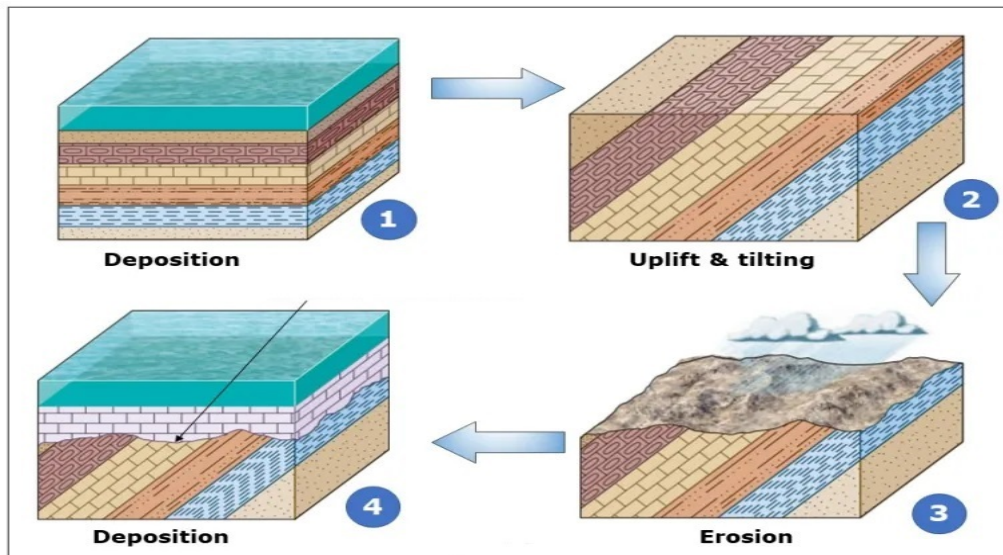


Figure E

(CO2) [Comprehension]

13. A salt dome is a type of structural dome formed when salt (or other evaporite minerals) intrudes into overlying rocks in a process known as diapirism. Salt domes can have unique surface and subsurface structures, and they can be discovered using techniques such as seismic reflection. If we drill a salt dome, then it'll collapse. The salt domes do not have that much strength to hold them intact while drilling. Suppose, we came to know about the existence of a salt dome beneath the surface from a seismic reflection study and the dome is acting as a petroleum trap as portrayed in Figure B. Considering the expected drilling challenges, a total of three drilling strategies (i.e., 1, 2, and 3 in Figure B) are proposed by a trainee engineer. Being an experienced drilling engineer, considering both drilling challenges and economic aspects, **(a)** Choose the best drilling option proposed by the trainee engineer for implementation. Justify your answer for accepting as well as rejecting any of the proposed drilling strategies. **(b)** Analyze the challenges expected to encounter, and propose a new drilling strategy that can be implemented with comparatively fewer complications and more economically.

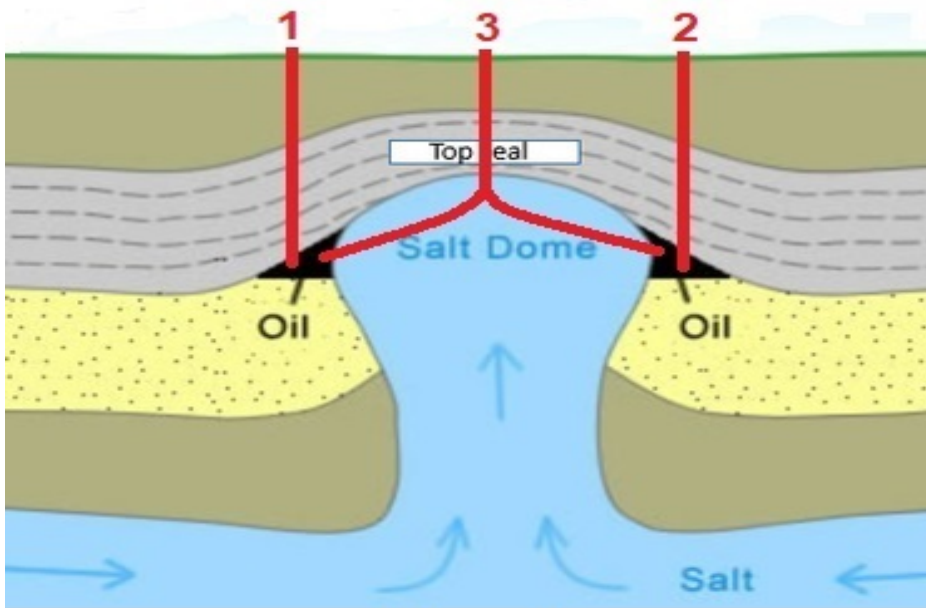


Figure B

(CO2) [Comprehension]

14. (a) The Earth is a member of the planetary system of the sun. The principal theories which have been advanced to explain the origin of the earth can be divided into two groups. Discuss the basic difference between the theories proposed by the above-mentioned two groups.
 (b) List any two of the existing theories/hypothesis that explains the origin of the Earth and explain them.

(CO1) [Comprehension]

PART C

ANSWER ALL THE QUESTIONS

(2 X 20 = 40M)

15. The conversion of organic matter to hydrocarbon required a chain of processes that depends on the type of organic matter deposited, burial pressure/temperature, and time. Name the processes involved in the conversion of organic matter to hydrocarbon sequentially and explain all of them.

(CO2) [Application]

16. Figure I (a and b) is displaying two important concepts in geology that describe how the shoreline of a body of water moves over time. Distinguish those two important concepts from Figure I.

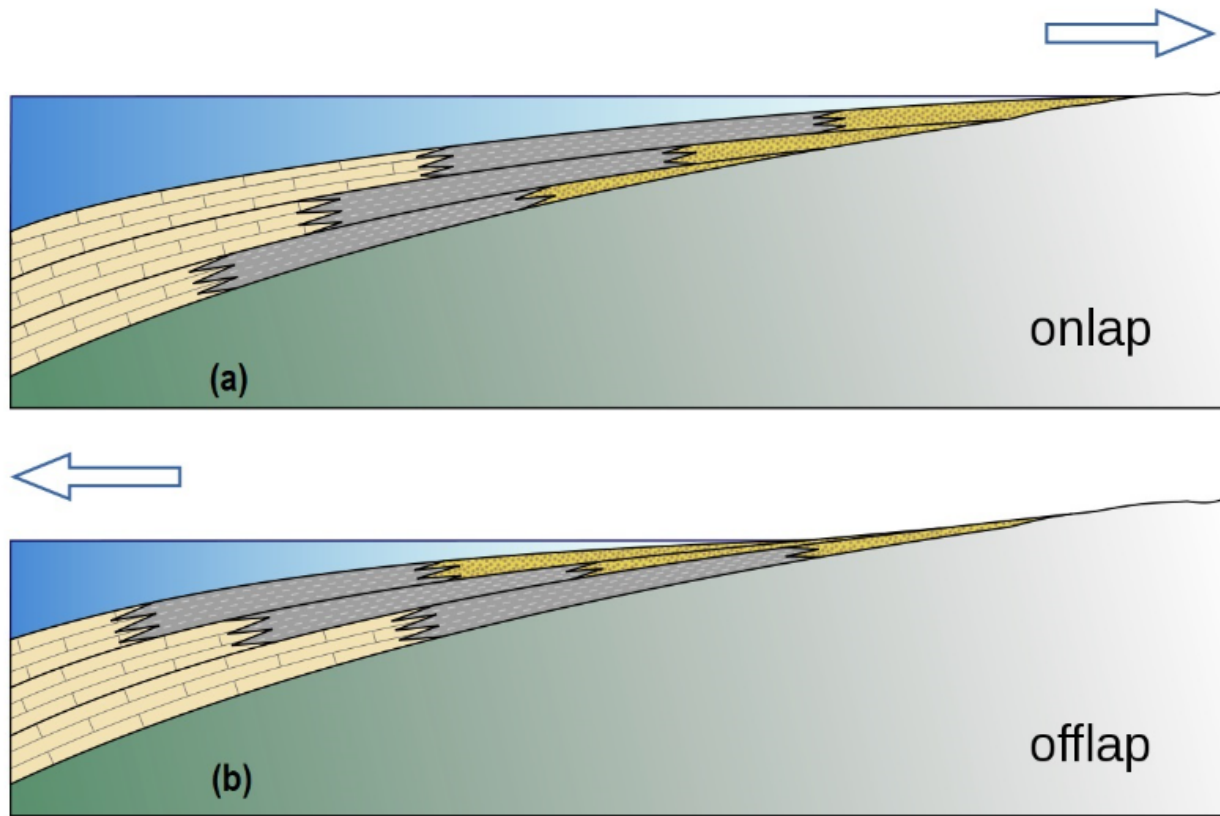


Figure I

(CO3) [Application]