

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019
UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, July 2020

Programme Name: B. Tech APE GIE

Course Name: Sedimentology

Semester: IV

Course Code: PEGS 2005

Nos of page(s): 01

Time : 02 hrs.

Max. Marks : 100

Instructions:

Read the instruction carefully before attempting.

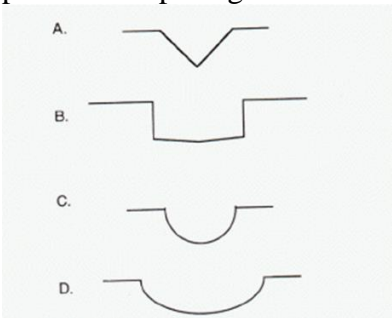
1. This question paper has two section, Section A and Section B.
 2. There are total of Five questions in this question paper. **One** in **Section A** and **four** in **Section B**
 3. **Section A** consist of **MC /TF / MA** based questions and has the total weightage of 60%.
 4. **Section A** will be conducted online on BB Collaborate platform
 5. **Section B** consist of **long answer/Assignment** based questions and has the total weightage of 40%.
 6. The maximum time allocated to **Section A** is two Hrs.
 7. **Section B** to be submitted within 24 hrs from the scheduled time of the this paper in **BB** (*exceptional provision due extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas with proper certification*).
- Answer of Questions of Section B should be hand written supported with relevant figures with their description. Cut & paste of text and figures will not be allowed.
8. No submission of **Section B** shall be entertained after 24 Hrs.
 9. **Section B** should be attempted after **Section A**
 10. **The section B** should be attempted in blank white sheets (hand written) with all the details like programme, semester, course name, course code, name of the student, Sap id at the top (as in the format) and signature at the bottom
 11. All questions are Compulsory.

SECTION A (40 Marks)

S. No.		Marks 1 each	CO
Q 1	Which rock is also called secondary rock? a) Igneous rock b) Sedimentary rock c) Metamorphic rock d) No class of rock is termed so		Q 1 to 25 CO1
	Which is the rock present in the majority on the surface of earth? a) Igneous rock b) Sedimentary rock c) Metamorphic rock d) No class of rock in particular		

	<p>What are the mechanically formed sedimentary rocks also called?</p> <p>a) Clastic rocks b) Non-clastic rocks c) Elite rocks d) Mech rocks</p>		
	<p>In which condition deposition takes place?</p> <p>a) Ordinary pressure and temperature b) High temperature and low pressure c) High pressure and low temperature d) High pressure and high temperature</p>		
	<p>The process not associated with diagenesis is _____</p> <p>a) Sediments get gradually converted to cohesive material b) Sediments get gradually converted to hard material c) Decaying occurs basically d) Might occur due to pressure or cementing material</p>		
	<p>The process which involves pressure exerted by the load is _____</p> <p>a) Loading b) Welding c) Cementation d) Unloading</p>		
	<p>The process other than welding which is studied under diagenesis is__</p> <p>a) Co-welding b) Cementation c) Pressurizing d) Unloading</p>		
	<p>Rock salt may be formed by__</p> <p>a) Erosion b) Winds c) Continued evaporation d) Continued precipitation</p>		
	<p>Example of chemically formed sedimentary rocks is _____</p> <p>a) Gypsum b) Sandstone c) Shale d) Breccia</p>		
	<p>Pick the organically formed sedimentary rock.</p> <p>a) Shale b) Sandstone c) Breccia d) Limestone</p>		
	<p>How is the degree of packing in welding related to load of overlying sediments?</p> <p>a) Directly related b) Inversely related c) Not related at all d) Totally independent</p>		
	<p>Animal and vegetable life don't contribute to the formation of sedimentary rocks TRUE OR FALSE</p>		

	<p>The layered arrangement in sedimentary rocks is called _____</p> <p>a) Mud cracks b) Stratification c) Rain prints d) Ripple marks</p>		
	<p>The structure most prevalent to clastic rocks is _____</p> <p>a) Nodular structure b) Geode structure c) Concretionary structure d) Lamination</p>		
	<p>Each layer of a laminated structure of sedimentary rock is called _____</p> <p>a) Strata b) Leaf c) Lamina d) Layer</p>		
	<p>Which among the following is not a type of false bedding?</p> <p>a) Columnar b) Tabular c) Lenticular d) Wedge shaped</p>		
	<p>Type of bedding where sorting and arrangement has occurred based on grain size is _____</p> <p>a) Cross bedding b) Lamination c) Graded bedding d) Mud cracks</p>		
	<p>Graded bedding occurs due to which phenomenon?</p> <p>a) Wind settling b) Sunlight c) Gravitational settling d) Loading</p>		
	<p>Mud cracks are common in which type of sedimentary rocks?</p> <p>a) Fine grained b) Medium grained c) Coarse grained d) Not particular</p>		
	<p>Potholes in river bottom bedrock are formed by _____.</p> <p>a) the impact of a large rock moved by a strong current which makes a "crater" b) the grinding action of a pebble or cobble in a swirling eddy c) cascading water from a waterfall which wears away the rock d) none of the above</p>		
	<p>Which of the following does not provide evidence of shallow water environment?</p> <p>a) Lamination b) Rain prints c) Ripple marks d) Mud cracks</p>		

	<p>Peanut structure is shown by _____</p> <p>a) Sandstone b) Limestone c) Shale d) Breccia</p>		
	<p>What is the size required for a particle to be called gravel?</p> <p>a) Greater than 1 mm b) Lesser 1 mm c) Greater than 2 mm d) Lesser than 1 mm</p>		
	<p>What is not true about silts?</p> <p>a) They are coarser than sand b) They are finer than sand c) They are further divided into fine, medium and fine silts d) They are major constituents of shale</p>		
	<p>What is the average grain size of rudaceous rocks?</p> <p>a) Greater than 1 mm b) Lesser 1 mm c) Greater than 2 mm d) Lesser than 1 mm</p>		
	<p>Rudites are also called as__</p> <p>a) Arenites b) Psamites c) Lutites d) Psephites</p>		<p>Q 26 to 50 CO2</p>
	<p>An example for arenite would be---</p> <p>a) Breccia b) Shale c) Limestone d) Sandstone</p>		
	<p>Of the choices show below, the most common youthful cross-sectional river valley profile is as per figure is</p>  <p>a) ----- b)----- c)----- d)-----</p>		
	<p>Conglomerates consist of which shaped fragments mostly?</p> <p>a) Angular b) Sub-angular c) Rounded d) Edged</p>		

	<p>What is the term for a curved sandbar that forms on the inside curve of a stream?</p> <p>a) meander b) point bar c) dune d) oxbow</p>		
	<p>The term quartzite is associated with which type of sandstone?</p> <p>a) Siliceous sandstone b) Calcareous sandstone c) Argillaceous sandstone d) Ferruginous sandstone</p>		
	<p>The mineralogical composition of shale is clearly understood.</p> <p>a) True b) False</p>		
	<p>The tendency of a rock to split into flat, shell-like fragments parallel to bedding is called _____</p> <p>a) Cleavage b) Fracture c) Specific gravity d) Fissility</p>		
	<p>Which type of shale involves both clastic and non-clastic sources?</p> <p>a) Residual shales b) Transported shales c) Hybrid shales d) Quartz shales</p>		
	<p>Distinct texture shown by limestone is _____</p> <p>a) Sheeting b) Lamination c) Fossiliferous nature d) Mud cracks</p>		
	<p>Which type of limestone is non-marine is origin among the following?</p> <p>a) Chalk b) Kankar c) Shelly-limestone d) Argillaceous limestone</p>		
	<p>What is a metamorphosed sedimentary rock?</p> <p>a) Shale b) Limestone c) Coal d) Dolomite</p>		
	<p>What is the term used to express the process responsible for all the changes that take place in an original rock under the influence of changes?</p> <p>a) Hibernation b) Herbination c) Metamorphism d) Metagenesis</p>		
	<p>Sedimentary rocks never contain valuable natural resources because they are highly weathered.</p> <p>A) True</p>		

	B) False		
	Sedimentary rocks reveal a great deal about Earth surface conditions as they were forming. A) True B) False		
	Ripple marks preserved in a sandstone may be used to determine the direction a current was flowing. A) True B) False		
	The grain size of clastic sedimentary rocks may provide clues to the environment in which the sediments were deposited. A) True B) False		
	Some successions of sedimentary rocks allow geologists to interpret the history of sea-level oscillations on Earth. A) True B) False		
	Based on your experience, which of these environments will produce sediments with cross- bedding? a) the deep ocean b) a swamp c) a tropical rain forest d) a desert		
	Bounding surfaces a) Are subdividing surfaces of the sedimentary section and are commonly generated by the changing relative sea level. b) Surfaces that never tie to rebounds due to isostasy and eustasy. Are boundaries that never have to do shales and TOC, and cannot be considered key indicators of the kitchen. c) Are blurring surfaces that have to do with fracture patterns. re subdividing surfaces of the sedimentary section and are commonly generated by the changing relative sea level. d) Are blurring surfaces that have to do with fracture patterns		
	A depositional sequence is a) One that never uses water saturation in marker beds as sequence boundaries. b) The term used to indicate that hydrothermal alteration has occurred at certain intervals in time. c) A stratigraphic unit composed of a relatively conformable succession of genetically related strata and bounded at its top and base by unconformities or their correlative conformity. d) Never used in deep marine clastics such as turbidites		
	Stratigraphy is the science of a) Time and movement. b) The past is key to the present. c) The present is key to the past. d) Layered character of rocks.		

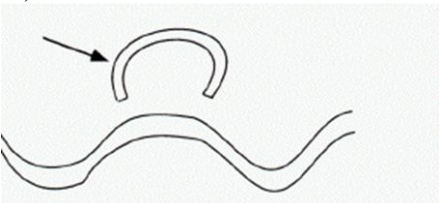
	<p>Sequence stratigraphy focuses on</p> <ul style="list-style-type: none"> a) Paleocological frameworks characterized by unique fossil assemblage b) The order in which the strata accumulated combined with depositional and erosional surface frameworks to interpret depositional settings c) Basin modeling and sea level d) Astroblemes and other allochthonous events that can have local and regional implications, resulting in unique traps 		
	<p>Walther's Law</p> <ul style="list-style-type: none"> a) Involves paleobotany and involves the depth and temperatures of seawater. b) Establishes the geochemical signature of different formations. c) Proposes that the vertical progression of facies should be the same as corresponding lateral facies changes. d) Differentiates between clay minerals and carbonates 		
	<p>Sequence stratigraphy involves a geologic model that makes the following assumptions:</p> <ul style="list-style-type: none"> A) Sea level position varied B) Subsidence was constant C) Sediment supply was constant D) All of the above 		
	<p>The sequence stratigraphy method of stratigraphic interpretation</p> <ul style="list-style-type: none"> A) Supports the idea that convection currents and subduction zones are the key to understanding depositional models. B) Combines the stratal architecture (geometric relationship) of the sedimentary facies and the chronological order of their accumulation to enhance the interpretation of depositional setting and prediction of stratal continuity. C) Involves microseismic and nothing more. D) Allows the geologist to rule out salt tectonics 		<p>Q 51 to 60 CO3</p>
	<p>Stacking patterns include</p> <ul style="list-style-type: none"> A) Parasequence B) Progradation C) Retrogradation D) Transgression E) All of the above 		
	<p>Sequence stratigraphy involves combining the following:</p> <ul style="list-style-type: none"> A) All of the below. B) Stratal architecture and the chronological order of the indicated facies along with grain size information and lithology. C) The provenance of the different grains, combined with structural systems. D) Diagenetic alteration and lamina 		
	<p>In this map view, the stream is flowing _____</p>		



- A) from top to bottom
- B) from bottom to top
- C) from right to left
- D) from left to right

In the figure below the arrow is pointing to a (n) _____.

- A) meander
- B) point bar
- C) natural levee
- D) oxbow lake



River terraces are composed of _____ and form as a result of rapid _____

- A) bedrock.... subsidence
- B) Bedrock..... uplift
- C) flood plain deposits subsidence
- D) flood plain deposits uplift

A delta is made up of sediments _____

- A) deposited at the mouth of a river
- B) deposited on the inside of a meander loop
- C) deposited at a mountain front
- D) deposited on the outside of a meander loop

Why is the Mississippi delta so large?

- A) because the Mississippi River transports a huge amount of sediment
- B) because the tides in the Gulf of Mexico are not very strong
- C) because waves in the Gulf of Mexico are not very strong
- D) all of these

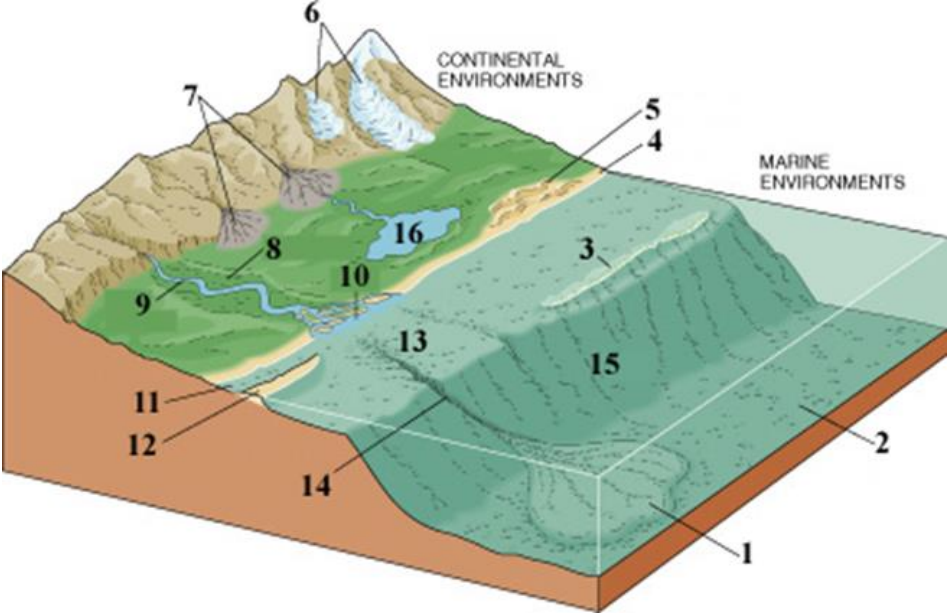
Which of the following statements about fluid flow is false?

- A) as the velocity of a stream increases, laminar flow may change to turbulent flow
- B) the viscosity of most fluids increases as temperature increases
- C) most streams and rivers are turbulent
- D) the more viscous the fluid, the more likely the flow is laminar

What type of flow can transport gravel and cobbles?

- A) Laminar
- B) turbulent
- C) both A and B
- D) neither A nor B

SECTION B

Q 2	<p>a) Explain the factors considered under the Folk’s classification of sandstone. Describe their implications as hydrocarbon reservoir</p> <p>b) With the suitable diagram describe the Dunham’ Classification of Limestone</p>	10	CO3
Q 3	<p>a) What are the different Sedimentary Cycles? Describe at least one cycle in detail</p> <p>b) What is the role of sedimentology in a sedimentary basin analysis</p>	10	CO4
Q 4	<p>Assignment 1: Write a detailed assignment describing following points supported with relevant figures.</p> <p>I. Regional architecture of depositional systems, systems tracts, and stratigraphic surfaces</p> <p>II. Controls on accommodation and shoreline shifts in a marine environment and the concept of base level</p> <p>III. Concepts of water depth, sea level, relative sea level, and base level</p> <p>IV. Concepts of transgression, normal regression, and forced regression, as defined by the interplay of base-level changes and sedimentation at the shoreline</p> <p>V. Nomenclature of systems tracts and timing of sequence boundaries for the existing sequence stratigraphic models</p>	10	CO4
Q 5	<p>Assignment 2A: Common Sedimentary Environments of Deposition</p> <p>Identify the numbered sedimentary environments on the figure below and write describe in brief their hydrocarbon potential. What is the sedimentary environment represented by #1? Like this do for 1 to 16. (8Marks)</p>  <p>Assignment 1B: Explain the hydrocarbon prospectivity of Sub-marine fans. (2 Marks)</p>	10	CO3