Total No. of Questions : 8]

SEAT No. :

P4553

[Total No. of Pages :3

[4860] -1344

M.E. (Petroleum Engineering)

GEOLOGY IN RESERVOIR DESCRIPTION

(2013 Credit Pattern) (Semester - I) (512102)

Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

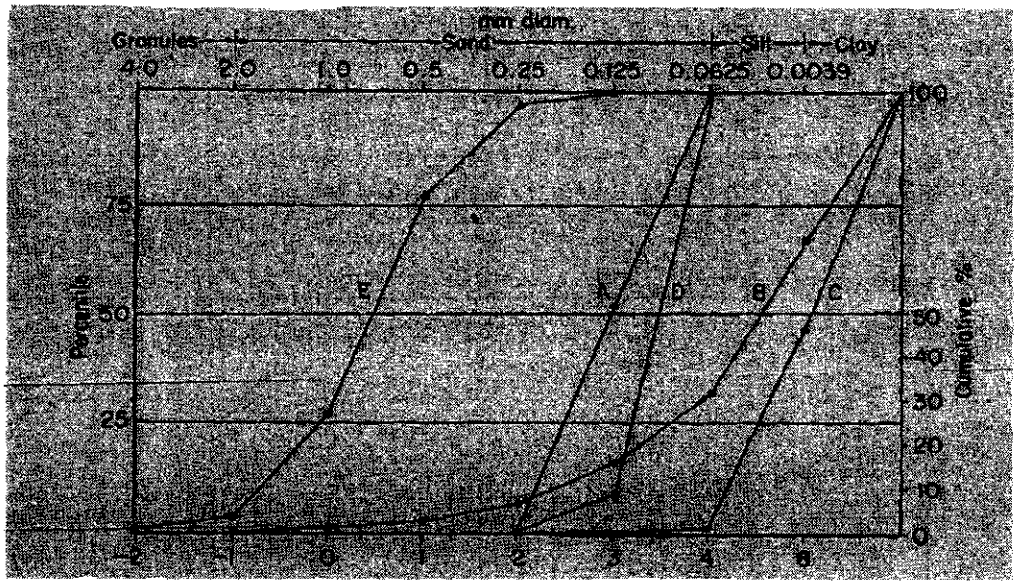
1) ***Answer any five questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume additionol data is required.***

Q1) a) Describe in brief triangular classification of sedimentary rocks involving sand-lime-clay/mud. **[4]**

b) Draw and explain in brief normal sedimentation process. **[4]**

c) What is a passive and an active continental margin? **[2]**

Q2) a) A graph of cumulative frequency distribution (CFD) is given for grain size variation to understand sorting of five samples. **[5]**



Compare curves of different samples and comment on sorting of sediments. Assuming the grain size is proportional to pore size, rank them from good to poor quality?

P.T.O.

b) Draw and describe standard relative permeability curve for oil and water. **[3]**

c) What is a coulomb failure and a Von Mises failure in rocks? **[2]**

Q3) a) How does knowledge of shale volume help better understand porosity permeability trend with increasing depth? **[4]**

b) What are the qualities of a reservoir rock? **[3]**

c) Describe in brief Dunham scheme of classification of carbonate rocks. **[3]**

Q4) a) Porosity permeability variation with increasing depth is given in following table. Plot a graph and comment on porosity permeability variation with increasing depth. **[5]**

Depth	Porosity	Permeability	Depth	Porosity	Permeability
3275	21.30	350.00	3293	24.04	121.87
3277	24.70	6495.00	3295	28.11	703.32
3279	24.20	353.00	3297	16.37	932.78
3281	27.70	2400.00	3299	24.04	1628.44
3283	27.40	1545.00	3301	30.00	216.00
3285	25.40	2085.00	3303	24.80	1944.00
3287	22.90	2500.00	3305	26.06	1560.88
3289	23.90	2647.00	3307	26.89	45.86
3291	25.82	625.00	3309	21.36	24.00

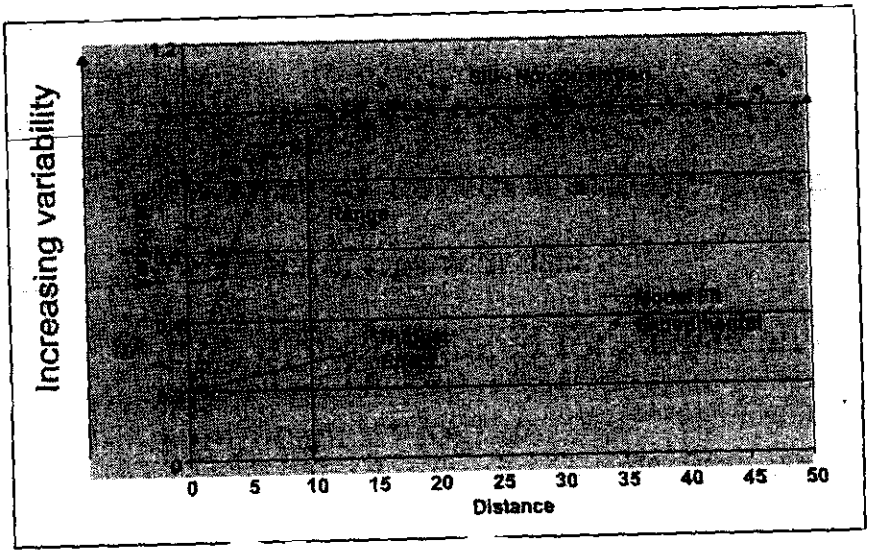
Table 1 for Q.4b.

b) Use above table to calculate hydraulic units from the data. How many flow units can be recognized here? **[5]**

Q5) a) Comment on the surface area model and pore size model focusing on constraints associated with each. **[5]**

b) Draw a sketch map showing the condition that the fault trace length is higher than interwell region. What impact this will have on reservoir withdrawal and efficiency? **[5]**

Q6) a) Explain Range, Sill and Nugget using following diagram. What is a significance of nugget value in the given diagram? **[5]**



b) How is geometric and zonal anisotropy recognized using variogram? **[5]**

Q7) a) Define following terms. **[4]**

i) Original Oil in place

ii) Abnormal pressure zone

iii) Oil Wet Reservoir and withdrawal efficiency

iv) Petroleum system.

b) What is Net to Gross thickness ratio? What are the parameters to decide this? **[3]**

c) Draw and explain in brief cyclic sedimentation. **[3]**

Q8) a) Calculate the amount of oil present in a reservoir covering an area of 600 acres with an average thickness of 10 ft. The average porosity is 20%, formation volume factor is 1.22, and water saturation is 30%. **[5]**

b) What is meant by P10, P50 and P90 in reserves estimation? Explain your answer using above example. **[5]**