

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Methods in Structural Geology (GSEG-401)

Semester: VII

Programme: B-Tech GSE

Time: 03 hrs.

Max. Marks: 100

Instructions :All the question are compulsory wherever necessary draw neat sketch

Number of pages: 04

SECTION A

S. No.		Marks	CO
Q 1	Write a short note on the following terms: a) Plunge b) Aspirates c) Hackle line d) Rollover anticline e) Gravity fault	10	CO1
Q.2	Fill in the blanks with suitable answer 1 In the fold crests and troughs of beds are smooth, broad and flat. 2 This feature is called as phenomenon is popularly expressed as anticlinal valley and synclinal hills formed due to erosion. 3 fault with the displacement of the foot wall with respect to the hanging wall is uniform along the fault plane. 4 A set of faults occur in a peripheral manner and enclosing circular area are examples of faults. 5 The folds do not maintain their orthogonal thickness 6 The.....are features representing <i>sediments</i> that filled depressions on the immediately subjacent erosive scour <i>bedding</i> plane. 7bedding occurs when sand ripples are deposited in mud in an isolated distribution pattern 8 The ripples generate cross-laminae that are curvy but have a unidirectional swoop are called..... ripples 9 The point bar is a depositional feature made of alluvium that accumulates on the inside bend of streams and rivers below the slope. 10 The direction and magnitude of heave and throw can be measured only by finding common intersection points on either side of the fault called a.....points.	10	CO2

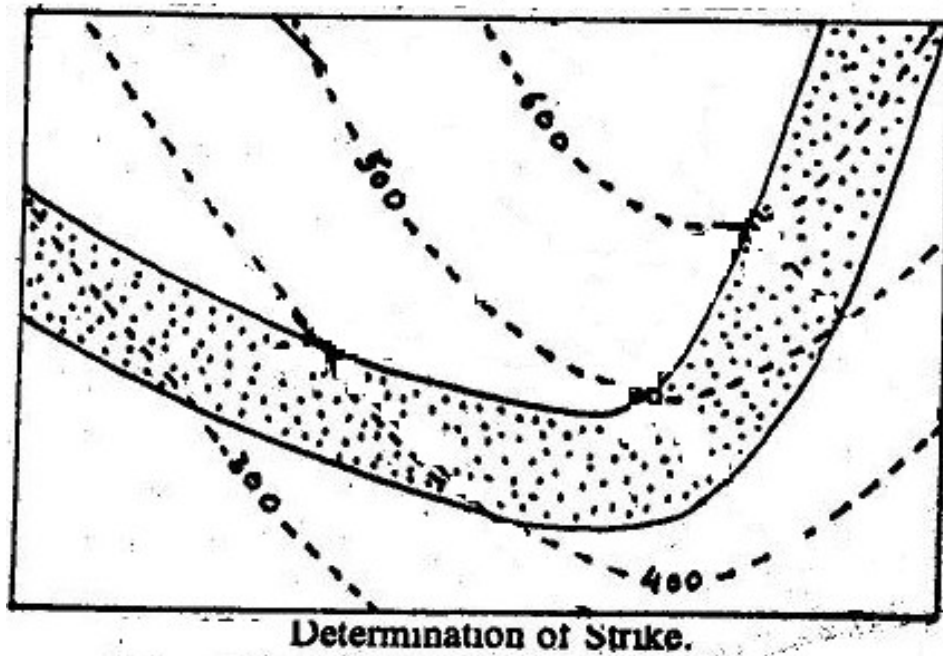
SECTION B			
Q.3	Differentiate between the following terms: i) Mud cracks and Syneresis cracks ii) Monocline fold and Homocline fold iii) Fault gouge and Fault breccia iv) Diagonal joints and Longitudinal Joints v) Fracture trace and Fracture front	10	CO3
Q.4	Describe in brief stress & strain classification and their significance in structural analysis.	10	CO4
Q.5	Explain with suitable diagram of following fault types and their significance. i) Ring fault ii) slip faults iii) Synthetic iv) antithetic faults	10	CO5
Q.6	Draw a neat sketch and explain in brief the following types of folds in structural analysis. a) Fault propagation folding ii) flow folding iii) detachment folding OR Draw a neat sketch of fold geometry and label its components. Explain their significance in fold classification.	10	CO6
SECTION-C			
Q.7	a) Define stereo net? Discuss in briefly type of stereo net and their significance in structural geology. b) Explain in brief structural contour map and geological map and application in structural geology. c) Three Boreholes are sunk at SW, SE and NW corners of square level ground. The each side of the Square is 600m long. The Bore holes are P, Q & R, the Bore holes meet the coal seam at 100m in P, 200m in Q and 300m in R . Determine the attitude of the coal seam. Fourth Bore hole (S) is proposed at NE of the square land. Find out at what depth, the bore hole (S) encounters the coal seam. (Scale 1cm = 100m and 1cm = 1 gradient)	5+5+10	CO3 CO4 CO5
Q.8	i) In a banded sandstone quarry the following measurement were taken; the red color band shows apparent dip amount 40° and direction 210° and white color band shows apparent dip amount 40° and direction 160° . Find the direction of strike and true dip amount. ii) The following data is obtained from the field structural analyses plot all these data using stereographic net. a) Find the line of intersection of plane N40° E 65°NW and N25°W 55°SW . b) Plot the lineation's is aligned with the following plunge and azimuth directions a) 35 and 225, b) 45 and 165 c) 65 and 330 and d) 25 and 65	6+4+4+6 OR 4+9+7	CO4 CO5 CO6

c) Plot following shear stress data

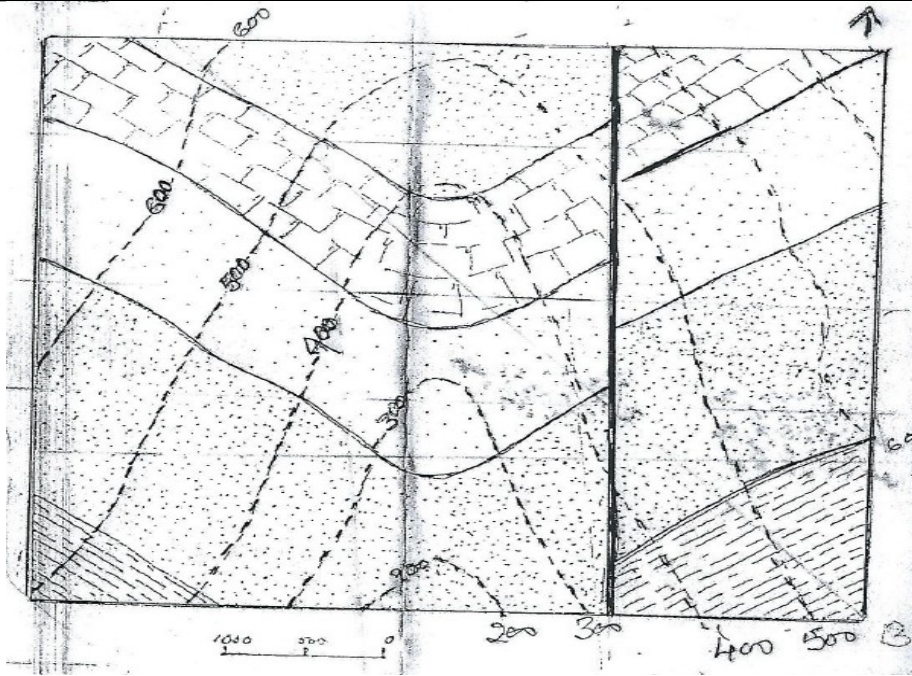
Sigma 1	Dip = 30	Strike = 300	Magnitude= 65
Sigma 2	Dip = 42	Strike = 220	Magnitude= 35
Sigma 3	Dip = 55	Strike = 145	Magnitude= 45

OR

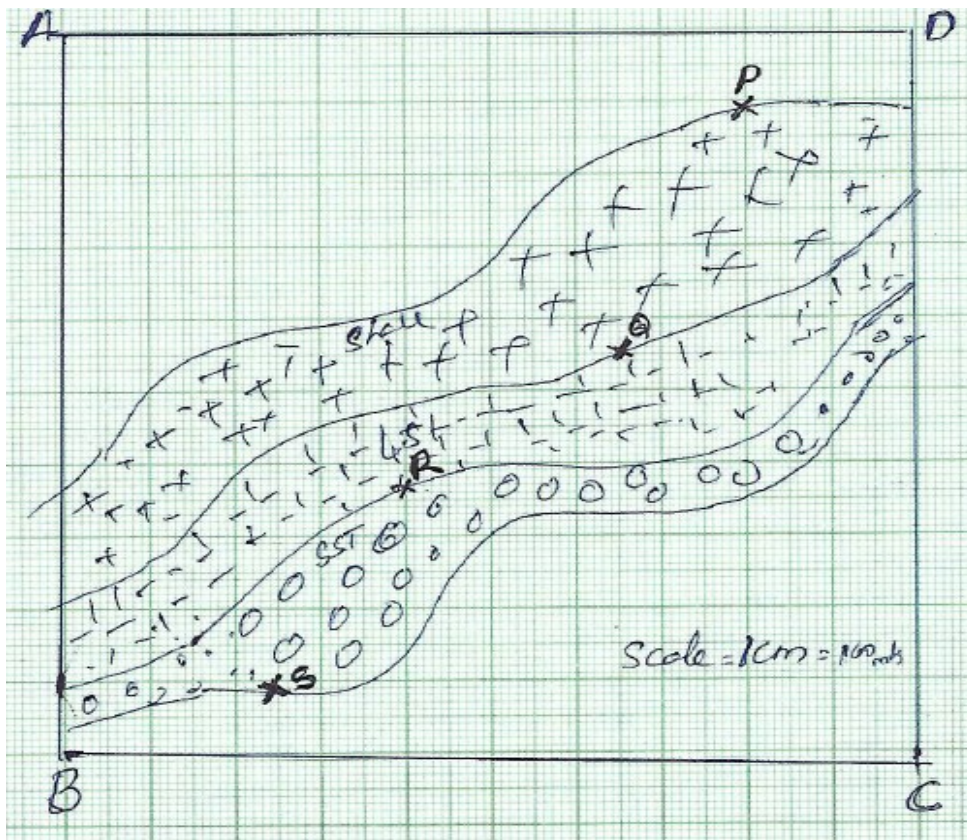
d) Find out the dip and strike for the given map scale is 1cm= 50 M



- e) Find the suitable cross section and determine the dip and strike for the given map scale is 1cm =100m. Plot a profile section and identify the geological structure in the cross section map.
- f) The outcrop ABCD is 1000m on each side. The alternative layers of shale, limestone and sandstone are expose in the outcrop section. Two bore holes are drilled along the P to Q and R to S. The strike of the bed shale is N 40° E and bed sandstone strike is N 40° W. Find out the True Vertical Thickness and True Stratigraphic Thickness. Scale is 1cm=100m



Q.e



Q.f