Name:

Enrolment No:

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

Course: Route Planning and Surveying **Semester: I**
Programme: M Tech Pipeline Engineering **Time: 03 hrs.**
Max. Marks: 100 **Course Code: CIVL7001**
Instructions: Write your assumptions carefully and attempt all the questions

Set A

SECTION A

S. No.		Marks	CO
Q1.	What are the two basic principles of surveying?	**4**	**CO1**
Q2.	Explain the temporary adjustments of a prismatic compass.	**4**	**CO2**
Q3.	The stadia readings with horizontal sight on a vertical staff held 100 m from a tacheometer were 1.28 m and 1.78 m. The focal length of the object glass was 20 cm. The distance between the object glass and the vertical axis of the tacheometer was 15 cm. Calculate the stadia interval.	**4**	**CO3**
Q4.	Explain the two point problem in plane table surveying.	**4**	**CO3**
Q5.	A circular curve has a 200 m radius and 60° deflection angle. Calculate: (i) Apex distance, and (ii) Mid-ordinate. (Assume chord length of 30m)	**4**	**CO4**

SECTION B

Q6.	Determine the gradient from a point P to another point Q from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertical.	**10**	**CO3**

Instrument station	*Staff station*	*Bearing*	*Vertical angle*	*Staff readings (m)*
R	*P*	130°	+ 10°32′	1.255, 1.810, 2.365
	Q	220°	+ 5°06′	1.300, 2.120, 2.940

Q7.	With the help of an example, explain how you will measure the height of an inaccessible building if you are given a tape and a theodolite?	**10**	**CO2**
Q8.	Fill up the missing quantities and apply the usual checks for the following entries of a field book**:**	**10**	**CO1**

		Station	**BS**	**IS**	**FS**	**Rise**	**Fall**	**RL**	**Remarks**
		1	3.125					?	**BM**
		2	?		?	1.325		125.505	**TP**
		3		2.320			0.055	?	
		4		?		?		125.850	
		5	?		2.625		?	?	**TP**
		6	1.620		3.205		2.165	?	**TP**
		7		3.625			?	?	
		8			?			123.090	**TBM**
	OR								
Q8.	The following notes refer to the reciprocal levels taken with one level: *Instrument station* | *Staff readings on* A | B | *Remarks* *A* | 1.03 | 1.630 | Distance *AB* = 800 m *B* | 0.95 | 1.540 | R.L. of *A* = 450 m Find: (i) True R.L. of B (ii) Combined correction for curvature and refraction (iii) Error in collimation adjustment of the instrument.								**10** **CO1**
Q9.	Following are the bearings taken in a closed compass traverse: **Line** | **FB** | **BB** AB | S37°30'E | N37°30'W BC | S43°15'W | N44°15'E CD | N73°00'W | S72°15'E DE | N12°45'E | S13°15'W								**10** **CO2**

	EA | N60°00'E | S59°00'W Compute the interior angles and correct them for observational errors.		
SECTION-C			
Q10.	A) It is required to set out a curve of radius 100 m with pegs at approximately 10 m center. The deflection angle is 60°. Draw up the data necessary for pegging out the curve by each of the following methods: a) Offsets from long chord b) Chord bisection c) Offsets from tangent B) Explain the characteristics of contours. Also show that a closed contour line with one or more higher ones inside it represents a hill	**6+4+4 +6**	**CO4**
	OR		
Q10.	In making a survey for a new road, the intersection point of two straights was found to be inaccessible. Four points P, Q, R, S (see Fig.) were therefore selected two on each straight, and the distance between Q and R was found to be 122.20 m. If the angle PQR was 169°47'40'' and the angle QRS 148°22'2'', draw up a table of deflection angles and chainage for setting out a 200 m radius curve by pegs driven at every 20 m through chainage. Chainage of Q = (140 + 90) chains.	**20**	**CO4**
Q11. A	a) A 30 m chain was found to be 12 cm too long after chaining a distance of 1750 m. It was found to be 23 cm too long at the end of day's work after chaining a total distance of 3600 m. Find the true distance if the chain was correct, before the commencement of the work. (b) The length of the line measured with 20.0m chain was 1341.0m. The same line when measured with 30.0 m chain was 20m too short was fond to be 1350.00m. Determine the error in 20.0m chain.	**10**	**CO1**
B.	Derive the elevation and the distance formulae for staff vertical. in case of tacheometric surveying.	**10**	**CO3**