

Roll No: -----



**UNIVERSITY OF PETROLEUM AND ENERGY STUDIES**

**End Semester Examination, December 2017**

**Program: M Tech PLE**  
**Subject (Course): Route Surveying & Planning**  
**Course Code : Civil 7001**  
**No. of page/s:**

**Semester – I**  
**Max. Marks : 100**  
**Duration : 3 Hrs**

**Section A ( Attempt all questions)**

1.	During a survey it was found that while taking the perpendicular distance from the survey line an obstruction was observed- suggest methods to overcome such.	5	CO2															
2.	Suggest ways to establish the RL of a point where MSL is not available nearby	5	CO1															
3.	Explain the method of joining straight with a curve	5	CO5															
4.	How tachometer is advantageous than a theodolite?	5	CO4															
<b>SECTION B (Attempt all Questions)</b>																		
5.	A chain was tested before starting a survey and was found to be exactly 20 m long. At the end of the survey it was tested again and was found to measure 20m and 20 cm. the area of the plan drawn to scale 8m to 1 cm was 220sq. cm. find the true area of the filed	10	CO2															
6.	ABCD is a traverse. The included angles are measured as $\angle A=110^\circ$ , $\angle B=54^\circ$ , $\angle C=125^\circ$ , $\angle D=71^\circ$ . Calculate the bearings of the traverse lines with A as origin and AB as arbitrary meridian	10	CO3															
7.	Calculate the length CD and the bearing of the line AB from the following traverse observations  <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Line</th> <th>Bearing</th> <th>Length (m)</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>Roughly east</td> <td>150.00</td> </tr> <tr> <td>BC</td> <td>178°</td> <td>75.5</td> </tr> <tr> <td>CD</td> <td>270°</td> <td>Not obtained</td> </tr> <tr> <td>DA</td> <td>1°</td> <td>63.00</td> </tr> </tbody> </table>	Line	Bearing	Length (m)	AB	Roughly east	150.00	BC	178°	75.5	CD	270°	Not obtained	DA	1°	63.00	10	CO3
Line	Bearing	Length (m)																
AB	Roughly east	150.00																
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8.	The following offsets from a traverse line to an irregular boundary were measured at points 5m as shown:	10	CO2															

Chainage (m)	0	5	10	15	20	25	30	35	40			
Offset (m)	6.15	10.92	9.03	11.58	14.22	12.33	9.72	10.32	7.65			
<b>SECTION C ( Attempt any one of 9 &amp; 11) 10 is compulsory</b>												
9.	The following readings were taken on a sloping ground and BM was 150.00. Find the RLs of various stations and apply usual checks. 0.345, 1.245, 2.45, 3.905, 0.465, 2.77,3.895,0.995,1.390.2.785,3.785.									20	CO1	
10.	Derive the H and V values for tachometer set on the ground and focusing a stadia rod held vertical to the sloping ground, if the stadia constants for the above conditions is 100 and 0 and stadia reading is 2 m, with the vertical angle $10^\circ$ calculate H & V values									20	CO4	
11.	Derive the formula for finding the offsets from the long chord of length 3R and angle $\delta$ . If the value of mid- ordinate is 5 m, and $\delta=45^\circ$ , mark the offsets and regular intervals along the long chord and also sketch the curve.									20	CO5	



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### Section A ( Attempt all questions)

1.	Figure the differences between offset rod and cross staff	5	CO2															
2.	A surveyor has to find the RLs of a station on the opposite bank, make him understand few techniques	5	CO1															
3.	What are the curves that are used in scarce land situation? Draw and explain	5	CO5															
4.	How stadia readings are interpreted to find the distance of farther and nearer object	5	CO4															
<b>SECTION B (Attempt all Questions)</b>																		
5.	A chain was tested before starting a survey and was found to be exactly 30 m long. At the end of the survey it was tested again and was found to measure 30m and 20 cm. the volume cut was found to be 1000 cu. Ft. find the true volume of the filed	10	CO2															
6.	ABCD is a traverse. Correct the bearings for local attraction error. The bearings of the lines are <table style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th style="padding: 2px;">Line</th> <th style="padding: 2px;">Fore Bearing</th> <th style="padding: 2px;">Back bearing</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">AB</td> <td style="padding: 2px;">S 45° 30' E</td> <td style="padding: 2px;">N 45° 30' W</td> </tr> <tr> <td style="padding: 2px;">BC</td> <td style="padding: 2px;">S 60° 0' E</td> <td style="padding: 2px;">N 60° 40' W</td> </tr> <tr> <td style="padding: 2px;">CD</td> <td style="padding: 2px;">S 5° 30' E</td> <td style="padding: 2px;">N 3° 20' W</td> </tr> <tr> <td style="padding: 2px;">DA</td> <td style="padding: 2px;">N 83° 30' W</td> <td style="padding: 2px;">S 85° 0' E</td> </tr> </tbody> </table>	Line	Fore Bearing	Back bearing	AB	S 45° 30' E	N 45° 30' W	BC	S 60° 0' E	N 60° 40' W	CD	S 5° 30' E	N 3° 20' W	DA	N 83° 30' W	S 85° 0' E	10	CO3
Line	Fore Bearing	Back bearing																
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7.	Explain about balancing in traverse computations?	10	CO3															
8.	Differentiate between radiation, resection and intersection in plane table surveying	10	CO2															
<b>SECTION C ( Attempt any one of 10 &amp; 11) 9 is compulsory</b>																		
9.	The following readings were taken on field fill the missing readings ( X1 TO X11)	20	CO1															
	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Station</th> <th style="width: 15%;">BS</th> <th style="width: 15%;">IS</th> <th style="width: 15%;">FS</th> <th style="width: 15%;">HI</th> <th style="width: 15%;">RL</th> <th style="width: 15%;">Remarks</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Station	BS	IS	FS	HI	RL	Remarks										
Station	BS	IS	FS	HI	RL	Remarks												

	A	1.23			288.32	X1				
	B		0.985			X2				
	C		X8			298.00				
	D	0.985		X9	300.00	X3				
	E		X10			295.00				
	F	0.765		2.85	X11	X4				
	G		3.64			X5				
	H		3.735			X6				
	I			0.865		X7				
10.	Derive the H and V values for tachometer set on the ground and focusing a stadia rod held normal to the line of sight on the sloping ground, if the stadia constants for the above conditions is 500 and 0.35 and stadia reading is 1.8 m, with the vertical angle $15^\circ$ calculate H & V values								20	CO4
11.	Derive the formula for finding the offsets by offsets from tangents and radial offsets whose long chord length is $2R$ and angle $\delta/2$ . If the value of mid- ordinate is 8 m, and $\delta=30^\circ$ , mark the offsets at regular intervals in both the methods above and sketch the curve.								20	CO5

