Name:

Enrolment No:

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

Course: Surveying (CIVL 2008) **Semester: III**

Programme: B Tech Civil Engineering

Time: 03 hrs. **Max. Marks: 100**

Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Define fly leveling and sketch the same.	4	CO1
Q 2	How Simpson's rule is superior to other rules for finding area?	4	CO2
Q 3	What are the three axes of the theodolite?	4	CO3
Q 4	What are the different stadia hairs generally used during tachometry?	4	CO4
Q 5	Define length of curve and how is it derived?	4	CO5

SECTION B

Q 6	Find the RL of the roof top and the entrance sill of the room, with the following readings that were taken on a benchmark of 100.00, 1.215 and inverted staff reading of 0.25 (at entrance) , 1.765 (in the middle of the roof)	10	CO1
Q 7	A two – level section has a formation width of 15 m and side slopes of 1.5:1. The traverse slope of ground is 6:1. The central heights at 25 m intervals are 2.5 m, 3.0 m and 3.5 m. find the volume of earthwork in the length of 50 m.	10	CO2
Q 8	Find the length and bearing of line BC from the partial data available for traverse ABCDA. **Line** | **AB** | **BC** | **CD** | **DA** **Length (m)** | **234.8** | **158.5** | **Missing** | **203.1** **Bearing** | **N 3º45' E** | **N 78 º 40' E** | **Missing** | **S 71º 18' W**	10	CO3
Q 9	A tachometer was kept at a station P and observations were made to a staff held vertically at Q. the cross hair readings 1.735, 1.855 and 2.755. The vertical angle of depression was 7º 06'. From the same set up, the reading on a staff held at BM of RL 928.55 was 2.765 m. Find the horizontal distance PQ and the RL of point Q. K=100 and C=0 . (OR) The tangent length of a 4º circular curve is 32.45 m. determine the deflection angle,	10	CO4 , CO5

<table>
<tr><td></td><td>apex distance and the length of long chord.</td><td></td><td></td></tr>
<tr><td colspan="4">SECTION-C</td></tr>
<tr><td>Q 10</td><td>The following staff readings were observed in sequence: 1.32, 2.60, 1.38, 0.63, 1.65, 1.08, 2.12 and 1.55. The instrument was shifted after the third and sixth readings. The third reading was taken to an arbitrary benchmark of elevation 0.000. Find the reduced levels of all other points.</td><td>20</td><td>CO1</td></tr>
<tr><td>Q11</td><td>A curve of radius 300 m and deflection angle 75º was to be set from offsets from the chords produced. The chainage of the first tangent point is 1002.35 m. calculate the first five offsets from the chords produced to set out the curve. [10]

Line AB is along the north direction and line BC has a bearing of 100º. A curve has to be set tangential to a point 225 m from B along BA and also tangential to BC. Tabulate the perpendicular offsets from the tangents to set out the curve. [10]

(OR)

To determine the elevation of a point P, a tachometer was set up at station A and observations were made to a staff held vertically at P. As a check, the instrument was set up at another B and observations were taken to a staff held at P. The RL of the BM was 135.455. The instrument constants were 100 and 0.2. Determine the RL of P from the following data recorded.

<table>
<tr><th>Instrument at</th><th>Staff at</th><th>Vertical Angle</th><th>Hair Readings</th><th>Readings at BM</th></tr>
<tr><td>A</td><td>P</td><td>3º 35'</td><td>1.235, 1.795, 2.355</td><td>1.75</td></tr>
<tr><td>B</td><td>P</td><td>2º35'</td><td>0.945, 1.490, 2.035</td><td>2.25</td></tr>
</table>
</td><td>20</td><td>CO4, CO5</td></tr>
</table>

Name: **Enrolment No:**	UPES

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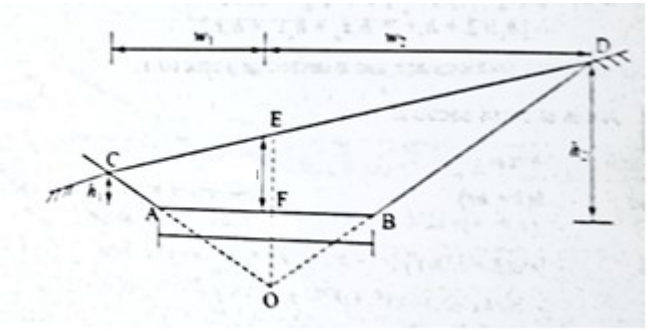
Time: 03 hrs. **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	Define reciprocal leveling with a neat sketch.	**4**	**CO1**
Q 2	Differentiate between mid-ordinate rule and average ordinate rule.	**4**	**CO2**
Q 3	Derive the distance for an inclined line of sight with an angle of elevation α using tachometry.	**4**	**CO3**
Q 4	Explain the procedure for repetition method of measuring horizontal angles.	**4**	**CO4**
Q 5	What is a reverse curve draw sketch.	**4**	**CO5**

SECTION B

Q 6	1. A two level section is shown in Figure find the area of the section; EF – 2.4 mt, AB- 6 mt.  2.	**10**	**CO2**
Q 7	Students nearby to campus conducted a survey and the Chainage were noted at start and ends 99.450 and 134.660, a curve is to be established between the Chainage for a deflection angle 30⁰ find the elements needed.	**10**	**CO5**
Q 8	The stadia readings obtained with a horizontal line of sight from an instrument were 1.36, 0.96 and 2.31 at a distance of 100 m. if the focal length of the objective lens was 20 cm and the distance between the objective lens and the vertical axis was 15 cm, find the stadia interval. K=100 and C=0	**10**	**CO4**

<table>
<tr><td>Q 9</td><td>Find the missing values of the following traverse

<table><tr><td>Line</td><td>Length</td><td>Bearing</td></tr><tr><td>AB</td><td>125</td><td>45°</td></tr><tr><td>BC</td><td>50</td><td>125°</td></tr><tr><td>CD</td><td>95</td><td>missing</td></tr><tr><td>DA</td><td>145</td><td>missing</td></tr></table>(OR)

The following readings were taken with a leveling staff and an auto level on a sloping ground, find the RLs of various stations (assume the BM to be 100.00)

0.965,1.345,2.45,3.560,0.650,2.500, 3.650</td><td>10</td><td>CO1, CO3</td></tr>
<tr><td colspan="4">SECTION-C</td></tr>
<tr><td>Q 10</td><td>Some observations are missing from the page of a field book shown below. Find the missing readings from the available data .

<table><tr><td>Staff Station</td><td>Back sight</td><td>Intermediate sight</td><td>Fore sight</td><td>HI</td><td>RL</td><td>Remarks</td></tr><tr><td>A</td><td></td><td></td><td></td><td></td><td>100.9</td><td></td></tr><tr><td>B</td><td></td><td>1.85</td><td></td><td></td><td></td><td></td></tr><tr><td>C</td><td></td><td>2.15</td><td></td><td></td><td></td><td>BM RL 100</td></tr><tr><td>D</td><td>1.35</td><td></td><td></td><td></td><td>101.26</td><td></td></tr><tr><td>E</td><td></td><td></td><td>1.25</td><td>102.25</td><td></td><td></td></tr><tr><td>F</td><td></td><td></td><td></td><td></td><td>101.61</td><td></td></tr></table></td><td>20</td><td>CO1</td></tr>
<tr><td>Q11</td><td>A simple circular curve has a radius 800 m and a deflection angle of 36º. Tabulate the ordinates from the chord to set out the curve, using Rankine’s method (assume all data necessary)

(OR)

To determine the elevation of a point P, a tachometer was set up at station A and observations were made to a staff held inclined at P. As a check, the instrument was set up at another B and observations were taken to a staff held at P. The RL of the BM was 240.455. The instrument constants were 100 and 0.3. Determine the RL of P from the following data recorded.

<table><tr><td>Instrument at</td><td>Staff at</td><td>Vertical Angle</td><td>Hair Readings</td><td>Readings at BM</td></tr><tr><td>A</td><td>P</td><td>4º 45'</td><td>2.35, 2.95, 3.55</td><td>1.85</td></tr><tr><td>B</td><td>P</td><td>3º30'</td><td>0.45, 1.90, 2.35</td><td>2.05</td></tr></table></td><td>20</td><td>CO4, CO5</td></tr>
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