

Name:

Enrolment No:



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

Programme: B Tech Civil Engineering  
Course Name: Geomatics  
Course Code: CEEG 251  
No. of page/s: 3

Semester – IV  
Max. Marks : 100  
Duration : 3 Hours

Instructions: Assume any missing data suitably.

Set A

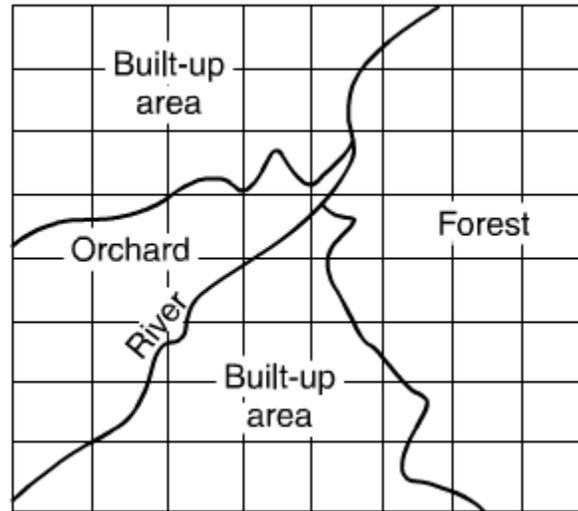
SECTION A (4x5=20)

S. No.		Marks	CO
Q 1	An observer standing on the deck of a ship just sees a lighthouse top with his eye at a height of 9 m. The top of the lighthouse is 64 m above m.s.l. Find the distance of the observer from the lighthouse.	4	CO1
Q2	Calculate the most probable value and the probable error of the area of a rectangle whose sides are as follows: a = 100 ± 0.02 m side b = 150 ± 0.01 m.	4	CO2
Q3	A line AB measures 11.00 cm on a photograph taken with a camera having a focal length of 21.5 cm. The same line measures 3 cm on a map drawn to scale of 1/45000. Calculate the flying height of the aircraft, if the average altitude is 350 m.	4	CO3
Q4	With the help of a schematic diagram, explain GPS receiver and equipment segment.	4	CO4
Q5	Explain the Napier’s rule of circular parts.	4	CO5

SECTION B (10x4=40)

Q6.	Explain the various field checks in triangulation with the help of an example.	10	CO1									
Q7.	Compare the scales of photography for the area recorded and the strip widths given by cameras A and B at the same flying heights.  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Camera A</th> <th>Camera B</th> </tr> </thead> <tbody> <tr> <td>Format</td> <td>180mm x 180mm</td> <td>230mm x 230mm</td> </tr> <tr> <td>Focal Length</td> <td>210mm</td> <td>150mm</td> </tr> </tbody> </table> <p>How many photographs would be taken by the camera A in covering a strip 16 km long at a flying height of 1350 m? The longitudinal overlap is 60%.</p>		Camera A	Camera B	Format	180mm x 180mm	230mm x 230mm	Focal Length	210mm	150mm	10	CO3
	Camera A	Camera B										
Format	180mm x 180mm	230mm x 230mm										
Focal Length	210mm	150mm										
	OR											
Q7.	The base position of a 850 m high mountain is at 9 cm from the flight line on a flight map. If the flying altitude is 5600 m above the datum, calculate the relief displacement of the image of the peak and its distance from the edge of the photograph, given that the size of the print is 22.5 cm 22.5 cm.	10	CO3									
Q8.	For the given below vector data structure, give the corresponding raster data	10	CO4									

structure using both a) Coarse grid b) Fine Grid



Q9A)	Explain the properties of a spherical triangle.	5	CO5
B)	The local mean time at a place in longitude 69°30' E is 8h 20m 16s. Find the standard time if the place is in India.	5	CO5

**SECTION-C (20x2=40)**

Q 10.A	<p>The telescope of a theodolite is fitted with stadia wires. It is required to find the most probable values of the constants C and K of tacheometer. The staff was kept vertical at three points in the field and with line of sight horizontal the staff intercepts observed were as follows:</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>Distance of staff from tachometer D (m)</th> <th>Staff Intercept S (m)</th> </tr> </thead> <tbody> <tr> <td>150</td> <td>1.495</td> </tr> <tr> <td>200</td> <td>2.000</td> </tr> <tr> <td>250</td> <td>2.505</td> </tr> </tbody> </table>	Distance of staff from tachometer D (m)	Staff Intercept S (m)	150	1.495	200	2.000	250	2.505	16	CO2
Distance of staff from tachometer D (m)	Staff Intercept S (m)										
150	1.495										
200	2.000										
250	2.505										

B.	Describe the criteria for the site selection of base line.	4	CO1
----	--	---	-----

OR

Q10.A	<p>Adjust the following angles of a triangle.</p> <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>A</th> <th>B</th> <th>C</th> </tr> </thead> <tbody> <tr> <td>34°22'13''</td> <td>69°32'48''</td> <td>76°03'18''</td> </tr> <tr> <td>12''</td> <td>44''</td> <td>22''</td> </tr> <tr> <td>16''</td> <td>45''</td> <td>21''</td> </tr> <tr> <td>17''</td> <td>49''</td> <td>17''</td> </tr> <tr> <td>11''</td> <td>46''</td> <td></td> </tr> <tr> <td>9''</td> <td></td> <td></td> </tr> </tbody> </table>	A	B	C	34°22'13''	69°32'48''	76°03'18''	12''	44''	22''	16''	45''	21''	17''	49''	17''	11''	46''		9''			16	CO2
A	B	C																						
34°22'13''	69°32'48''	76°03'18''																						
12''	44''	22''																						
16''	45''	21''																						
17''	49''	17''																						
11''	46''																							
9''																								

B.	Derive the expression for the phase error of a signal.	4	CO1
----	--	---	-----

Q11.A	Derive the expression for displacement due to ground relief.	<b>8</b>	<b>CO3</b>
B.	Explain the working of IRNSS.	<b>6</b>	<b>CO4</b>
C.	With the help of a diagram, explain the spherical triangle, azimuth and latitude of a celestial sphere.	<b>6</b>	<b>CO5</b>