



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)  
Dundigal, Hyderabad-500043

## CIVIL ENGINEERING

### TUTORIAL QUESTION BANK

<b>Course Title</b>	<b>SURVEYING &amp; GEOMATICS</b>				
<b>Course Code</b>	ACEB01				
<b>Programme</b>	B.Tech				
<b>Semester</b>	III	CE			
<b>Course Type</b>	Core				
<b>Regulation</b>	IARE - R18				
<b>Course Structure</b>	<b>Theory</b>			<b>Practical</b>	
	<b>Lectures</b>	<b>Tutorials</b>	<b>Credits</b>	<b>Laboratory</b>	<b>Credits</b>
	3	-	3	3	1.5
<b>Chief Coordinator</b>	Mr. B Suresh, Assistant Professor				
<b>Course Faculty</b>	Dr. Shruthi Kaviti, Assistant Professor, Mr. B Suresh, Assistant Professor				

### COURSE OBJECTIVES:

<b>The course should enable the students to:</b>	
I	Describe the function of surveying in civil engineering construction.
II	Work with survey observations, and perform calculations.
III	Identify and calculate the errors in measurements and to develop corrected values for differential level circuits, horizontal distances and angles for open or closed-loop traverses.
IV	Operate an automatic level to perform differential and profile leveling properly record notes mathematically reduce and check levelling measurements

### COURSE OUTCOMES (COs):

CO 1	Explore the importance of Linear, angular and graphical methods involved in surveying to make a plan or map
CO 2	Understand various method of curve setting and Elements of curves at various locations.
CO 3	Analyse Co-ordinate transformation and accuracy considerations with GPS
CO 4	Analyze photographic mapping, mapping using paper prints, stereo plotting instruments, mosaics and map substitutes
CO 5	Summarize the concept of interaction of electromagnetic radiation with the atmosphere and earth surface.

### **COURSE LEARNING OUTCOMES (CLOs):**

ACEB01.01	Analyze the sources of errors in linear measurements.
ACEB01.02	Obtain the direction of a surveying line with a prismatic and surveyors compass
ACEB01.03	Explain the importance of theodolite and understand the principle of measuring angles in horizontal and vertical plains.
ACEB01.04	Draw cross section and prepare a contour maps for road works, rail works, canals etc.,
ACEB01.05	Draw and calculate the area enclosed with in the traverse.
ACEB01.06	Use Elements of simple, reverse, transition and compound curves at suitable locations
ACEB01.07	Understand the Method of setting out simple curves, compound curves and reverse curves etc.,
ACEB01.08	Calculate length of curve using various methods
ACEB01.09	Analyze geometric design of vertical curve at suitable location.
ACEB01.10	Understand the basic Principle of Electronic Distance Measurement
ACEB01.11	Understand different types of EDM instruments such as Distomat, and Total Station.
ACEB01.12	Summarize the Advantages and Applications Total Station
ACEB01.13	Understand Field Procedure for total station survey and Errors in Total Station Survey.
ACEB01.14	Differentiate the advantages of global positioning system and geographical information system.
ACEB01.15	Analyze Co-ordinate transformation and accuracy considerations with GPS.
ACEB01.16	Understand the basic concepts involved in Photogrammetric surveying.
ACEB01.17	Understand perspective geometry of aerial photograph.
ACEB01.18	Analyze relief and tilt displacements using aerial photogrammetric surveying.
ACEB01.19	Explain terrestrial photogrammetry, flight planning, Stereoscopy, ground control extension for photographic mapping by aerial triangulation and radial triangulation methods.
ACEB01.20	Analyze photographic mapping, mapping using paper prints, stereo plotting instruments, mosaics and map substitutes
ACEB01.21	Understand the basic concept of Electromagnetic Spectrum.
ACEB01.22	Summarize the concept of interaction of electromagnetic radiation with the atmosphere and earth surface.
ACEB01.23	Analyze remote sensing data acquisition on platforms and sensors.
ACEB01.24	Analyze visual image interpretation and digital image processing techniques.

## TUTORIAL QUESTION BANK

MODULE- I																			
INTRODUCTION TO SURVEYING																			
Part - A (Short Answer Questions)																			
S No	QUESTIONS	Blooms Taxonomy Level	Course Outcomes	Course Learning Outcomes (CLOs)															
1	Define Surveying and explain the principal of surveying.	Remember	CO 1	ACEB01.01															
2	State the two primary division of surveying.	Understand	CO 1	ACEB01.01															
3	Define bearing and explain different types of bearings.	Remember	CO 1	ACEB01.01															
4	What are the different types of compasses used in surveying?	Remember	CO 1	ACEB01.02															
5	Define local attraction. What are the causes for local Attraction?	Remember	CO 1	ACEB01.02															
6	Define magnetic Declination and explain types of magnetic declinations.	Remember	CO 1	ACEB01.02															
7	What is Datum and its importance in surveying?	Remember	CO 1	ACEB01.03															
8	Define Bench Mark and what are the different types of Bench marks?	Remember	CO 1	ACEB01.03															
9	What are the various checks in Rise and Fall method?	Remember	CO 1	ACEB01.03															
10	Define contour Gradient and write the importance of contours in civil engineering?	Remember	CO 1	ACEB01.03															
11	Explain the term contour interval.	Remember	CO 1	ACEB01.04															
12	Write the formula to determine an area using trapezoidal rule?	Remember	CO 1	ACEB01.04															
13	Write the formula to determine an area using Simpson's rule?	Understand	CO 1	ACEB01.04															
14	What is meant by a well-conditioned triangle?	Understand	CO 1	ACEB01.04															
15	Write the formula to determine an area using mid-ordinate rule?	Remember	CO 1	ACEB01.05															
16	What is meant by Non-transit theodolite?	Understand	CO 1	ACEB01.05															
17	Define swinging and explain clock wise and anti-clock wise swinging of telescope.	Understand	CO 1	ACEB01.05															
18	What is face Right observation of a theodolite?	Remember	CO 1	ACEB01.05															
19	Describe the essential parts of a transit theodolite.	Understand	CO 1	ACEB01.05															
20	Define telescope inverted and telescope normal.	Remember	CO 1	ACEB01.05															
Part - B (Long Answer Questions)																			
1	Define surveying and describe the classification of surveying in brief based up on Nature of field.	Understand	CO 1	ACEB01.01															
2	What are the primary division of surveying and describe the classification of surveying in brief based up on Instruments used?	Understand	CO 1	ACEB01.01															
3	A 20m chain was found to be 10cm too long after chaining a distance of 1500m. It was found to be 18 cm too long at the end of the day's work after chaining a total distance of 2900m. Find the true distance if the chain was corrected before the commencement of the work.	Understand	CO 1	ACEB01.01															
4	A 30m chain used for a survey was found to be 20.10 m at the beginning and 20.50 m at the end of the work. The area of the plan drawn to a scale of 1cm= 6m was measured with the help of a planimeter and was found to be 32.56 sq.cm find the true area of the field.	Understand	CO 1	ACEB01.01															
5	A steel tape 20 m long standardized at 55°F with a pull of 10Kg was used for measuring a base line. Find the correction per tape length, if the temperature at the time of measurement was 80°F and the pull exerted was 16Kg Take weight of tape as 0.8 Kg and $E = 2.109 \times 10^6 \text{ Kg/Cm}^2$ coefficient of thermal expansion per $1^\circ\text{F} = 6.2 \times 10^{-6}$ and area of tape was 0.051sq cm.	Understand	CO 1	ACEB01.02															
6	The fore and back bearings of the lines of a traverse are given below. Correct the bearings and check the geometrical condition of interior angles	Understand	CO 1	ACEB01.02															
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="width: 15%;">Line</th> <th style="width: 20%;">Fore Bearing</th> <th style="width: 20%;">Back Bearing</th> </tr> </thead> <tbody> <tr><td>AB</td><td style="text-align: center;"><math>61^\circ 12'</math></td><td style="text-align: center;"><math>241^\circ 12'</math></td></tr> <tr><td>BC</td><td style="text-align: center;"><math>153^\circ 24'</math></td><td style="text-align: center;"><math>333^\circ 24'</math></td></tr> <tr><td>CD</td><td style="text-align: center;"><math>201^\circ 02'</math></td><td style="text-align: center;"><math>21^\circ 02'</math></td></tr> <tr><td>DA</td><td style="text-align: center;"><math>280^\circ 14'</math></td><td style="text-align: center;"><math>100^\circ 14'</math></td></tr> </tbody> </table>	Line	Fore Bearing	Back Bearing	AB	$61^\circ 12'$	$241^\circ 12'$	BC	$153^\circ 24'$	$333^\circ 24'$	CD	$201^\circ 02'$	$21^\circ 02'$	DA	$280^\circ 14'$	$100^\circ 14'$			
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7	To find out the included angles in a closed traverse PQRSTP, the following observations were made with compass. Calculate the included angles after correcting for local attractions  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Line</th> <th>FB</th> <th>BB</th> </tr> </thead> <tbody> <tr> <td>PQ</td> <td>N 62°45'E</td> <td>S 62°15'W</td> </tr> <tr> <td>QR</td> <td>N 21°00'E</td> <td>S 20°45'W</td> </tr> <tr> <td>RS</td> <td>N71°30'W</td> <td>S 71°30'E</td> </tr> <tr> <td>ST</td> <td>S 39°00'W</td> <td>N 38°00'E</td> </tr> <tr> <td>TP</td> <td>S 54°30'E</td> <td>N 53°15'W</td> </tr> </tbody> </table>	Line	FB	BB	PQ	N 62°45'E	S 62°15'W	QR	N 21°00'E	S 20°45'W	RS	N71°30'W	S 71°30'E	ST	S 39°00'W	N 38°00'E	TP	S 54°30'E	N 53°15'W	Understand	CO 1	ACEB01.02				
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8	The following staff readings were obtained during a leveling work with the instrument being shifted after the 4 <sup>th</sup> , 7 <sup>th</sup> and 9 <sup>th</sup> . Readings: 2.305, 0.940, 0.865, 1.325, 2.905, 1.185, 1.205, 2.015, 1.365, 0.985 and 1.785. Find the reduced levels of the remaining points if the Reduced level at first point is 100.000m.	Understand	CO 1	ACEB01.03																						
9	Define contours and mention the various uses and advantages of contours in civil engineering.	Understand	CO 1	ACEB01.03																						
10	What are the characteristics of contours and define contour gradient, contour interval and horizontal equivalence?	Understand	CO 1	ACEB01.03																						
11	The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line 3.25,5.60,4.20,6.65,8.75,6.20,3.25,4.20,5.65 calculate the area enclosed between the survey line , the irregular boundary line and the first and last offsets, by the application of i) Trapezoidal rule and ii) Simpson's rule	Understand	CO 1	ACEB01.03																						
12	A series of offsets were taken from a chain line to a curved boundary line at intervals of 5metres the following order 2.65,3.80,3.75,4.65,3.60,4.95,5.85m compute the area between the chain line, the curved boundary line and the end offsets by i) Average - ordinate rule ii) Trapezoidal rule	Understand	CO 1	ACEB01.04																						
13	The following perpendicular offsets were taken from a chain line to a hedge. Compute the area included between the chain line, the hedge and offset by Trapezoidal rule  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Chainage</th> <th>0</th> <th>15</th> <th>30</th> <th>45</th> <th>60</th> <th>70</th> <th>80</th> <th>100</th> <th>120</th> <th>140</th> </tr> </thead> <tbody> <tr> <td>offset</td> <td>7.60</td> <td>8.5</td> <td>10.7</td> <td>12.8</td> <td>10.6</td> <td>9.5</td> <td>8.3</td> <td>7.9</td> <td>6.4</td> <td>4.4</td> </tr> </tbody> </table>	Chainage	0	15	30	45	60	70	80	100	120	140	offset	7.60	8.5	10.7	12.8	10.6	9.5	8.3	7.9	6.4	4.4	Understand	CO 1	ACEB01.04
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16	A railway embankment is 10m wide with side slope 1.5 to 1 assume the ground to be level in a direction traverse to the centre line, calculate the volume contained in a length of 120m, the centre height at 20m intervals being in meters 1.8, 3.7, 4.8, 4.0, 2.8, 2.8, 3.5 solve using Prismoidal rule.	Understand	CO 1	ACEB01.05																						
17	Explain the temporary adjustments of theodolite and discuss about various methods used in measuring horizontal and vertical angles.	Understand	CO 1	ACEB01.05																						

18	Define the following terms Transiting, swinging of telescope, face left observation, face Right observation and list out the various parts of theodolite.	Understand	CO 1	ACEB01.05
19	Derive the equation for heights and distances using trigonometric leveling When bases are accessible and inaccessible.	Understand	CO 1	ACEB01.05
20	Determine the reduced level of point P using trigonometric leveling when instrument is at point Q with bench mark 100m and back sight 1.143m base is inaccessible with angle of elevation $7^{\circ} 30'$ .	Understand	CO 1	ACEB01.05

**Part - C (Problem Solving and Critical Thinking Questions)**

1	From the traverse data given below , find closing error if any and its bearing <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Line</th> <th>Length in m</th> <th>Bearing</th> </tr> </thead> <tbody> <tr> <td>PQ</td> <td>340.2</td> <td><math>70^{\circ} 30'</math></td> </tr> <tr> <td>QR</td> <td>350.6</td> <td><math>120^{\circ} 45'</math></td> </tr> <tr> <td>RS</td> <td>440.8</td> <td><math>223^{\circ} 30'</math></td> </tr> <tr> <td>SP</td> <td>423.2</td> <td><math>320^{\circ} 47'</math></td> </tr> </tbody> </table>	Line	Length in m	Bearing	PQ	340.2	$70^{\circ} 30'$	QR	350.6	$120^{\circ} 45'$	RS	440.8	$223^{\circ} 30'$	SP	423.2	$320^{\circ} 47'$	Understand	CO 1	ACEB01.01					
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2	Describe the procedure to measure horizontal and vertical angle using theodolite	Understand	CO 1	ACEB01.01																				
3	What are the different types of bearing systems and discuss about whole circular bearing system and reduced bearing system	Understand	CO 1	ACEB01.02																				
4	What are the different methods of plane table surveying and explain about any three methods with neat sketch.	Understand	CO 1	ACEB01.02																				
5	The following offsets were taken from a chain line to hedge Compute the area included between the chain line, the hedge and offset by Simpson's rule. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Distance</th> <th>0</th> <th>20</th> <th>40</th> <th>60</th> <th>80</th> <th>120</th> <th>160</th> <th>220</th> <th>280</th> </tr> </thead> <tbody> <tr> <td>offset</td> <td>6.4</td> <td>10.8</td> <td>18.6</td> <td>21.2</td> <td>9.6</td> <td>6.4</td> <td>7.5</td> <td>3.3</td> <td>9.6</td> </tr> </tbody> </table>	Distance	0	20	40	60	80	120	160	220	280	offset	6.4	10.8	18.6	21.2	9.6	6.4	7.5	3.3	9.6	Understand	CO 1	ACEB01.03
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offset	6.4	10.8	18.6	21.2	9.6	6.4	7.5	3.3	9.6															
6	Determine the area of the closed traverse ABCDA by Departure and total latitude method. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Line</th> <th>Latitude</th> <th>Departure</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>+108</td> <td>+4</td> </tr> <tr> <td>BC</td> <td>+15</td> <td>+249</td> </tr> <tr> <td>CD</td> <td>-123</td> <td>+4</td> </tr> <tr> <td>DA</td> <td>0</td> <td>-257</td> </tr> </tbody> </table>	Line	Latitude	Departure	AB	+108	+4	BC	+15	+249	CD	-123	+4	DA	0	-257	Understand	CO 1	ACEB01.03					
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7	Determine the area of the closed traverse ABCDA by Co- ordinate method. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Line</th> <th>Latitude</th> <th>Departure</th> </tr> </thead> <tbody> <tr> <td>AB</td> <td>+108</td> <td>+4</td> </tr> <tr> <td>BC</td> <td>+15</td> <td>+249</td> </tr> <tr> <td>CD</td> <td>-123</td> <td>+4</td> </tr> <tr> <td>DA</td> <td>0</td> <td>-257</td> </tr> </tbody> </table>	Line	Latitude	Departure	AB	+108	+4	BC	+15	+249	CD	-123	+4	DA	0	-257	Understand	CO 1	ACEB01.04					
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8	Calculate the volume of embankment of which the cross sectional areas at 20 m intervals are as shown in table use Prismoidal rule. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Distance (m)</th> <th>0</th> <th>20</th> <th>40</th> <th>60</th> <th>80</th> <th>100</th> </tr> </thead> <tbody> <tr> <td>Area (m<sup>2</sup>)</td> <td>10</td> <td>40</td> <td>64</td> <td>72</td> <td>160</td> <td>180</td> </tr> </tbody> </table>	Distance (m)	0	20	40	60	80	100	Area (m <sup>2</sup> )	10	40	64	72	160	180	Understand	CO 1	ACEB01.04						
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9	Draw neat sketch of a vernier theodolite. Describe its main parts and their functions	Understand	CO 1	ACEB01.05																				
10	Define the terms transit theodolite, Non-transit theodolite, vertical axis and horizontal axis	Understand	CO 1	ACEB01.05																				

**MODULE-II**

**CURVES**

**Part – A (Short Answer Questions)**

1	Define point of intersection.	Understand	CO 2	ACEB01.06
2	What is point of tangency?	Understand	CO 2	ACEB01.06
3	Define length of long chord.	Understand	CO 2	ACEB01.06
4	Define forward tangent.	Understand	CO 2	ACEB01.06
5	Define backward tangent.	Remember	CO 2	ACEB01.07
6	What is tangent length?	Understand	CO 2	ACEB01.07

7	What is point of curvature?	Remember	CO 2	ACEB01.07
8	Define simple curve.	Understand	CO 2	ACEB01.07
9	Define compound curve.	Understand	CO 2	ACEB01.08
10	Define reverse curve.	Understand	CO 2	ACEB01.08
11	Define vertical curve.	Understand	CO 2	ACEB01.08
12	Calculate the degree of curve for 30m chain length.	Understand	CO 2	ACEB01.09
12	Calculate the degree of curve for 20m chain length.	Understand	CO 2	ACEB01.09
13	Calculate degree of curve for 30m chain length with radius 250m.	Understand	CO 2	ACEB01.09
14	Calculate degree of curve for 20m chain length with radius 500m.	Understand	CO 2	ACEB01.09

**Part - B (Long Answer Questions)**

1	Two straights intersect at chainage 2056.44m and the angle of intersection is $120^{\circ}$ . If the radius of the simple curve to be introduced is 600m find the following tangent distance and length of long chord.	Understand	CO 2	ACEB01.06
2	Two roads meet at an angle of $127^{\circ} 30'$ . Calculate the necessary data for setting out a curve of 15 chains radius to connect the two straight points of the road if it is intended to set the curve by chain and offsets only. Explain carefully how you would set out the curve in the field. Assume the length of chain as 20m. solve using Radial offsets method.	Understand	CO 2	ACEB01.06
3	Two roads meet at an angle of $127^{\circ} 30'$ . Calculate the necessary data for setting out a curve of 15 chains radius to connect the two straight points of the road if it is intended to set the curve by chain and offsets only. Explain carefully how you would set out the curve in the field. Assume the length of chain as 20m. solve using perpendicular offsets method.	Understand	CO 2	ACEB01.06
4	Discuss the method of setting out a circular curve with two theodolites. What are its advantages and disadvantages over Rankine's method.	Understand	CO 2	ACEB01.07
5	Discuss in brief about the elements of simple circular curve with figure and give their relationship?	Understand	CO 2	ACEB01.07
6	What are the advantages of curves? State various types of curves in civil engineering with sketch.	Understand	CO 2	ACEB01.08
7	Discuss in detail about various elements of simple circular curves with neat sketch.	Understand	CO 2	ACEB01.08
8	What is a vertical curve? Explain different types of vertical curves and list out the advantages of vertical curves?	Understand	CO 2	ACEB01.09
9	Explain following terms (i) Compound curve (ii) Point of intersection (iii) Tangent Distance (iv) Mid Ordinate and point of tangency.	Understand	CO 2	ACEB01.09
10	Enumerate the parts of a compound curve and describe the relationship between them.	Understand	CO 2	ACEB01.09

**Part - C (Problem Solving and Critical Thinking Questions)**

1	Describe the procedure of setting out simple circular curve by Perpendicular offset from tangent method.	Understand	CO 2	ACEB01.06
2	A horizontal curve is designed with a 600 m radius and is known to have a tangent length of 52 m. The PI is at station 200. Determine the stationing of the PT.	Understand	CO 2	ACEB01.07
3	Describe the procedure for setting out a simple curve by perpendicular offset from the long chord method.	Understand	CO 2	ACEB01.08
4	Describe the procedure of setting out of simple circular curve by Rankine's method of tangential angle.	Understand	CO 2	ACEB01.09
5	If the approximate perpendicular offset for the midpoint of a circular curve deflection through $76^{\circ} 38'$ is 96.1m. Calculate the radius of the curve.	Understand	CO 2	ACEB01.09

**MODULE -III**

**MODERN FIELD SURVEYING SYSTEMS**

**Part - A (Short Answer Questions)**

1	What is the principle of electronic distance measurement?	Remember	CO 3	ACEB01.10
2	Write a short note on Infrared wave instruments?	Remember	CO 3	ACEB01.10
3	Discuss about Light wave instruments.	Understand	CO 3	ACEB01.10
4	Define Microwave instruments.	Remember	CO 3	ACEB01.11
5	What is the main function of total station?	Remember	CO 3	ACEB01.11
6	What are the important features of total station?	Understand	CO 3	ACEB01.11
7	State any four advantages and disadvantages of total station.	Understand	CO 3	ACEB01.12

8	Write a note on errors in total station?	Remember	CO 3	ACEB01.12
9	What are the different types of modes in total station?	Understand	CO 3	ACEB01.12
10	What is the range of total station in field?	Understand	CO 3	ACEB01.12
11	Define Global Positioning System (GPS) with segments.	Understand	CO 3	ACEB01.13
12	What are the advantages of GPS?	Remember	CO 3	ACEB01.13
13	Write a short note on errors and biases?	Remember	CO 3	ACEB01.13
14	Describe Co-ordinate transformation in GPS.	Understand	CO 3	ACEB01.14
15	What is the main theme of GPS?	Remember	CO 3	ACEB01.14
16	How many satellites are available in each orbit of space segment?	Remember	CO 3	ACEB01.14
17	Write a sort note on control and operating segment of GPS?	Understand	CO 3	ACEB01.15
18	Write a sort note on space segment of GPS?	Remember	CO 3	ACEB01.15
19	Write a sort note on user segment of GPS?	Remember	CO 3	ACEB01.15
20	How many orbits have been provided in space segment for GPS?	Understand	CO 3	ACEB01.15

**Part – B (Long Answer Questions)**

1	What is the principle of total station and list the applications of total station in civil engineering?	Understand	CO 3	ACEB01.10
2	Discuss the disadvantages of total station in detail and what are the different types of modes available in total station?	Understand	CO 3	ACEB01.11
3	Write a short note on principle of electronic distance measurement? Discuss about remote elevation and remote distance method in total station.	Understand	CO 3	ACEB01.12
4	What are the preventive measures to be followed in total station surveying to minimize the errors?	Understand	CO 3	ACEB01.12
5	Discuss in detail about the field procedure of total station to calculate an area of field?	Understand	CO 3	ACEB01.12

6	What are the applications of Global Positioning System in civil engineering? Discuss about space and user segments.	Understand	CO 3	ACEB01.13
7	Discuss about Global Positioning System and list out the segments of Global Positioning System in detail.	Understand	CO 3	ACEB01.14
8	Write a short note on Co-ordinate transformation and accuracy consideration in Global Positioning System?	Understand	CO 3	ACEB01.15

**MODULE -IV**

**PHOTOGRAMMETRIC SURVEYING**

**Part – A (Short Answer Questions)**

1	What is meant by photogrammetry?	Remember	CO 4	ACEB01.16
2	What are the different types of photographs?	Remember	CO 4	ACEB01.16
3	Discuss about various types of cameras used in Photogrammetry.	Remember	CO 4	ACEB01.16
4	Define of direction of aircraft.	Remember	CO 4	ACEB01.16
5	What are fiducial marks on an image negative in aerial photogrammetry?	Understand	CO 4	ACEB01.16
6	Define the Scale of a vertical aerial photograph?	Remember	CO 4	ACEB01.17
7	What is stereoscope?	Understand	CO 4	ACEB01.17
8	What is meant by Relief Displacement?	Understand	CO 4	ACEB01.17
9	Elucidate the basic geometrical elements of a vertical aerial photograph with a neat sketch.	Understand	CO 4	ACEB01.17
10	Distinguish the difference between a map and an ortho photo and describe the following terms: GCP, mosaic, Stereo pair, Fiducial marks.	Understand	CO 4	ACEB01.17
11	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Remember	CO 4	ACEB01.18
12	Elucidate the basic geometrical elements of a vertical aerial photograph with a neat sketch.	Understand	CO 4	ACEB01.18
13	What is stereoscope?	Understand	CO 4	ACEB01.18
14	What is low oblique photograph and high oblique photograph?	Understand	CO 4	ACEB01.18
15	Define tilt displacement.	Remember	CO 4	ACEB01.19
16	Define Fudicial point, scale and relief displacement.	Understand	CO 4	ACEB01.19
17	Define the Scale of a vertical aerial photograph.	Understand	CO 4	ACEB01.20
18	How many minimum numbers of photographs are required for Stereo Photogrammetry?	Remember	CO 4	ACEB01.20
19	Define drift in while taking aerial photographs.	Remember	CO 4	ACEB01.20

20	What is meant by Focal length of lens is aerial photography?	Understand	CO 4	ACEB01.20
<b>Part – B (Long Answer Questions)</b>				
1	The distance from two points on a photographic point to the principle line are 68.24mm to the left and 58.48mm to the right the angle between points is $44^{\circ} 30'$ . Determine focal length of lens.	Understand	CO 4	ACEB01.16
2	Vertical photographs were taken from a height of 3500m above the terrain with a camera of 15cm focal length. Calculate the scale of photography.	Understand	CO 4	ACEB01.16
3	The distance of an image of a triangulation station 250m above mean sea level from the principal point is 3.20cm. calculate the height displacement if the flying height of the camera is 2000	Understand	CO 4	ACEB01.16
4	A vertical photo graph was taken at an altitude of 1200m above mean sea level determine scale of photo graph at an elevation of 80m with the focal length of the camera is 15cm.	Understand	CO 4	ACEB01.16
5	Derive an equation for displacement of photo Image due to height in Photogrammetric surveying.	Understand	CO 4	ACEB01.16
6	A camera having focal length of 20cm is used to take a vertical photograph having an average elevation of 1500m what is the height above mean sea level at which an aircraft must fly in order to get the scale of 1:8000	Understand	CO 4	ACEB01.17
7	A line AB 2000m long at an elevation of 500m measures 8.65cm on a vertical photograph for which focal length is 20cm determine scale of photograph in an area of average elevation of 800m	Understand	CO 4	ACEB01.17
8	A section line AB appears to be 10.16cm on a photograph for which focal length is 16cm the corresponding line measures 2.54cm on a map with a scale 1/50000 the terrain has an average elevation of 200m above mean sea level calculate flying height of aircraft when photograph has taken.	Understand	CO 4	ACEB01.17
9	Define the following terms Nadir Point, Photo Principal point, Azimuth, ground Nadir point, and Horizon.	Understand	CO 4	ACEB01.17
10	The distance from the principal point to an image on photograph is 6.44cm and elevation of object above datum is 250m what is the relief displacement if datum scale is 1/10000 and focal length of camera is 20cm.	Understand	CO 4	ACEB01.18
11	What are the two methods used to determine the scale of the aerial photograph in Photogrammetric surveying?	Understand	CO 4	ACEB01.18
12	A tower AB 50m height appears in a vertical photograph at a flight altitude of 2500m above mean sea level the distance of the image of top of the tower is 6.35cm compute the displacement of the image of the top of the tower with respective the image at its bottom. The elevation at the bottom of the tower is 1250m.	Understand	CO 4	ACEB01.18
13	A vertical photograph of a flat area having an average elevation of 250m above mean sea level was taken with a camera having focal length of 20cm a section line AB 250m long in the area measures 8.50cm on the photograph. A tower TB in the area also appears on the photograph the distance between the images of top and bottom of the tower is 0.46cm on the photograph. The distance of the image of top of the tower is 6.46cm determine the height of tower.	Understand	CO 4	ACEB01.18
14	Determine average scale of aerial photogrammetry of three points PQR are traced on a contour map at an elevation 1200m, 1600m and 1800m the datum of mean sea level at this points were obtained at 4200m the focal length of camera axis was 150mm.	Understand	CO 4	ACEB01.19
15	What are the different types of photographs and list the advantage of an oblique aerial photograph?	Understand	CO 4	ACEB01.19
16	The distance from two points on a photographic point to the principle line are 65.22mm to the left and 54.40mm to the right the angle between points is $45^{\circ} 30'$ . Determine focal length of lens.	Understand	CO 4	ACEB01.19
17	A camera having a focal length of 200mm is to be used to take a vertical photograph of a terrain having an average element of 2000m at what height above datum the aircraft should fly to have photograph at a scale of 1:5000?	Understand	CO 4	ACEB01.20
18	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Understand	CO 4	ACEB01.20
19	Illustrate how the difference in elevation displaces the position of a photographic image.	Understand	CO 4	ACEB01.20
20	What is Fudicial Centre? How it is determined explain in detail in Photogrammetric surveying.	Understand	CO 4	ACEB01.20
<b>Part – C (Problem Solving and Critical Thinking)</b>				
1	What is difference between an oblique photograph and panoramic photograph?	Understand	CO 4	ACEB01.16



2	Relief Displacement exists because photos are a perspective projection. Explain how can this be used to determine the height of an object on the terrain?	Understand	CO 4	ACEB01.16
3	Discuss how the height of an object on the terrain can be determined using stereo parallax measurements.	Understand	CO 4	ACEB01.17
4	Discus the different types of aerial photograph in Photogrammetric surveying.	Understand	CO 4	ACEB01.17
5	Illustrate end lap, side lap, and forward lap in Photogrammetric surveying.	Understand	CO 4	ACEB01.18
6	Illustrate the scale of Aerial photograph in Photogrammetric surveying.	Understand	CO 4	ACEB01.18
7	Distinguish an oblique and highly oblique Aerial photograph?	Understand	CO 4	ACEB01.19
8	What are factors effecting in aerial photographs and list the preventive measures to minimize them in Photogrammetric surveying?	Understand	CO 4	ACEB01.19
9	A tower AB 100m height appears in a vertical photograph at a flight altitude of 2700m above mean sea level the distance of the image of top of the tower is 6.55cm compute the displacement of the image of the top of the tower with respectve the image at its bottom. The elevation at the bottom of the tower is 1250m.	Understand	CO 4	ACEB01.20
10	A vertical photograph of a flat area having an average elevation of 350m above mean sea level was taken with a camera having focal length of 25cm a section line AB 350m long in the area measures 10.50cm on the photograph. A tower TB in the area also appears on the photograph the distance between the images of top and bottom of the tower is 0.46cm on the photograph. The distance of the image of top of the tower is 6.46cm determine the height of tower.	Understand	CO 4	ACEB01.20

### MODULE -V

#### REMOTE SENSING

##### Part - A (Short Answer Questions)

1	Define Remote Sensing.	Understand	CO 5	ACEB01.21
2	Define Scattering.	Remember	CO 5	ACEB01.21
3	What is active remote sensing and passive remote sensing?	Understand	CO 5	ACEB01.21
4	Explain about two energy sources available for earth passive remote sensing and elucidate with their spectral characteristic curves.	Remember	CO 5	ACEB01.21
5	Describe spectral properties of water bodies and how these can be used to differentiate pure and sediment water.	Remember	CO 5	ACEB01.22
6	What is passive remote sensing?	Remember	CO 5	ACEB01.22
7	Define Ground control points.	Understand	CO 5	ACEB01.22
8	Which part of the EMR spectrum is used for radar remote sensing?	Understand	CO 5	ACEB01.22
9	Which part of the EMR spectrum is used for optical remote sensing?	Understand	CO 5	ACEB01.22
10	In earth remote sensing, What are the visible wavelength bands used?	Understand	CO 5	ACEB01.23
11	Which part of the EMR spectrum is used for radar remote sensing?	Remember	CO 5	ACEB01.23
12	Define Spatial Resolution?	Understand	CO 5	ACEB01.23
13	What is meant by Spectral Resolution?	Remember	CO 5	ACEB01.23
14	Define Radiometric Resolution?	Understand	CO 5	ACEB01.24
15	Atmospheric Windows are useful in Remote Sensing. Why?	Remember	CO 5	ACEB01.24
16	In which orbits the Earth Remote Sensing Satellite revolve?	Understand	CO 5	ACEB01.24

##### Part - B (Long Answer Questions)

1	Analyze the elements or processes involved in earth remote sensing with a neat diagram.	Understand	CO 5	ACEB01.21
2	Illustrate the Electromagnetic spectrum, with emphasis on optical visible spectral bands.	Understand	CO 5	ACEB01.21
3	Discuss the difference between active and passive remote sensing and explain about the energy sources used.	Understand	CO 5	ACEB01.21
4	Scrutinize various applications and advantages of aerial and satellite remote sensing.	Understand	CO 5	ACEB01.21
5	Explain about two energy sources available for earth passive remote sensing and elucidate with their spectral characteristic curves.	Understand	CO 5	ACEB01.22
6	In earth remote sensing, What are the visible wavelength bands used?	Understand	CO 5	ACEB01.22
7	Discuss the interaction of Electromagnetic Radiation with the Earth's atmosphere using various scattering mechanism.	Understand	CO 5	ACEB01.22
8	Write a detailed note on NOAA Satellite and discuss the particulars of NOAA Satellites.	Understand	CO 5	ACEB01.23
9	Draw a neat diagram classification of imaging sensor systems.	Understand	CO 5	ACEB01.23
10	What is resolution? Illustrate different types of resolution.	Understand	CO 5	ACEB01.23
11	Which part of the EMR spectrum is used for radar remote sensing?	Understand	CO 5	ACEB01.24
12	Which part of the EMR spectrum is used for optical remote sensing?	Understand	CO 5	ACEB01.24

13	Name some important satellite platforms which are in orbit currently.	Understand	CO 5	ACEB01.24
14	What is visible wavelength band used in Earth Remote Sensing?	Understand	CO 5	ACEB01.24
<b>Part – C (Problem Solving and Critical Thinking)</b>				
1	What are the visual image interpretation elements in Remote Sensing?	Understand	CO 5	ACEB01.21
2	Describe the interaction process of Electromagnetic radiation with the Earth's surface features.	Understand	CO 5	ACEB01.21
3	Discuss how the sensors are classified or categorized in Remote Sensing.	Understand	CO 5	ACEB01.21
4	Explain the terms Spectral Reflectance, Specular reflection, Diffuse reflection.	Understand	CO 5	ACEB01.22
5	Describe at least three platforms used for Earth Remote Sensing.	Understand	CO 5	ACEB01.22
6	Is RADAR Imaging Satellite (RISAT) of India is a platform for Active Sensor or Passive sensor? Why?	Understand	CO 5	ACEB01.22
7	Define the basic concepts and foundation of Remote Sensing.	Understand	CO 5	ACEB01.23
8	Define remote Sensing and components of Remote Sensing.	Understand	CO 5	ACEB01.23
9	What is Active remote sensing? Explain with an example.	Understand	CO 5	ACEB01.24
10	What is passive Remote Sensing? Explain with an example.	Understand	CO 5	ACEB01.24

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