Scoring Indicators

COURSE NAME : BASIC SURVEYING

COURSE CODE :2011 **QID :** 2106220106

Q No	Scoring Indicators	Split score	Sub Total	Total score
	PART A			**9**
I. 1	Invar tape	1	1	
I. 2	Follower	1	1	
I. 3	Surveying is the art of determining the relative positions of points on, above or beneath the surface of earth by means of direct or indirect measurements of distance, direction and elevation	1	1	
I. 4	Local attraction is a term used to denote any influence which prevents the needle from pointing to themagnetic north in a given locality	1	1	
I. 5	Quadrantal bearing system/ Reduced bearing	1	1	
I. 6	Mean sea level is the average height of the sea for all stages of the tides	1	1	
I. 7	Level surface is defined as a curved surface which at each point is perpendicular to direction of gravity at the point	1	1	
I. 8	Fly levelling, Profile levelling, Check levelling, Reciprocal levelling, Profile levelling	(Any 2) 1	1	
I. 9	Perpendicular	1	1	
	PART B			24
II. 1	Instruments for chaining 1. Chain / Tape 2. Arrows 3. Pegs 4. Ranging rods 5. Offset rods 6. Plasterer's laths and whites 7. Plumb bob	3	3	

II. 2	Resection Resection is the process of determining the plotted position of the station occupied by the plane table, by means of sights taken towards known points, locations of which have been plotted ~~Four methods of orientation~~ ~~Resection after orientation by compass~~ ~~Resection after orientation by backsighting~~ ~~Resection after orientation by three point problem~~ ~~Resection after orientation by two point problem~~ two point – Three point – 1.	2	3 2 1	
II. 3	Classification based on object of survey 1. Engineering survey 2. Military survey 3. Mine survey 4. Geological survey 5. Archeological survey	1 1 1	3	
II. 4	Methods of balancing a traverse. 1. Bowditchs method 2. Transit method 3. Graphical method 4. Axis method	1 1 1	3	
II. 5	i. R.B = 180 - W.C.B = 180° - 170°12´ = S 9°48´ E ii. R.B = W.C.B - 180° = 211°54' – 180° = S31°54´W iii. W.C.B = 360° – R.B = 360° – 5°42´ = 354° 18´	1 1 1	3	
II. 6	Declination = + 5° 38' True bearing = 48° 24' + 5° 38' = 54° 02'	1 2	3	
II. 7	i) Height of instrument is the elevation of line of sight with respect to the assumed datum ii) Back Sight is the sight taken on a rod held at a point of known elevation iii) Fore sight is the sight taken on a rod held at a point of unknown elevation	1 1 1	3	
II. 8	Elimination of parallax Parallax is a condition arising when the image formed by the	2 1	3	

	objective is not in the plane of croos hairs. Unless parallax is eliminated accurate sighting is impossible Parallax can be eliminated in 2 steps 1. By focusing the eyepiece for distinct vision of cross hairs 2. By focusing the objective to bring the image of the object in the plane of cross hairs	½ ½		
II.9	Fundamental relations among the axes of a level 1. Axis of the bubble tube should be perpendicular to the vertical axis 2. The horizontal cross hair should lie in a plane perpendicular to the vertical axis 3. The line of collimation of telescope should be parallel to the axis of bubble tube	1 1 1	3	
II.10	Profile levelling Also known as longitudinal sectioning The reduced levels of various points at regular intervals are found along a line or set of lines. Then sectional view of the ground is drawn to get a profile Commonly employed in deciding railway, highway, canal and sewage line routes	2 1	3	

	PART C			4 2
III. 1	Intersection method Is resorted to when the distance between the point and the instrument station is either too large or cannot be measured accurately	2	7	7
	The location of an object is determined by sighting at the object from two plane table stations (previously plotted) and drawing the rays. The intersection of these rays will give the position of the object Procedure 1. Set the table at A, level it and transfer the point A on to the sheetby way of plumbing fork. Clamp the table 2. Mark the north direction with trough compass 3. Pivoting alidade about a,sight it to B. Measure AB and plot it along ray to get b. Base line ab is thus drawn 4. Pivoting alidade about a, sight details C,D, E etc and draw rays 5. Shift the table at B and set it there. Orient the table roughly by compass and finally by backsighting A 6. Pivoting the alidade about b, sight details C, D, E etc and draw corresponding raysalong edge of alidade to intersect with previously drawn rays in c,d,e etc. The positions of the points are thus mapped by way of intersection	3		
	Figure	2		
III. 2	Area of AFB = ½ x 100 x 60 =3000 m^2	1	7	7
	Area of FEB = ½ x 150 x 60 =4500 m^2	1		
	Area of ACG = ½ x 120 x 40 =2400 m^2	1		
	Area of GCDH = ½ x (40+20) x 80 = 2400 m^2	1		
	Area of HDE = ½ x 50 x 20 = 500 m^2	1		
	Total Area = 3000+4500+2400+2400+500 = 12800 m^2	1		
	Figure	1		

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<tr>
<td>III. 3</td>
<td>Conditions to be fulfilled by survey lines / survey stations
1. Survey stations must be mutually visible
2. Survey lines must be as few as possible so that frame work can be plotted conveniently
3. The frame work must have 1 or 2 base lines. If one base line is used it must run along the length and through middle of area. If 2 baselines are used they must intersect in the form of letter X
4. The lines must run through level ground as possible
5. The main lines should form well conditioned triangle
6. Each triangle or portion of skeleton must be provided with sufficient check lines
7. Short offsets are preferred
8. Main survey lines should not pass through obstacles
9. Main survey lines should fall with in the boundaries of the property to be surveyed</td>
<td>2
3
(Any 7)
2</td>
<td>7</td>
<td>7</td>
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<tr>
<td>III. 4</td>
<td>
<table>
<tr><td>Prismatic compass</td><td>Surveyor's compass</td></tr>
<tr><td>The graduated ring attached to magnetic needle</td><td>Graduated ring and needle are free to move independently w.r.t each other</td></tr>
<tr><td>Needle is of broad needle type</td><td>Needle is of broad needle type</td></tr>
<tr><td>Graduated ring remains stationary while box is prism and object vane rotates as the ring attached with the needle is not attached with the box</td><td>Graduated ring rotates with rotation of box, eye vane and object vane as the ring is attached with the box of the compass and only needle remains stationary</td></tr>
<tr><td>Graduations are engraved inverted</td><td>Graduations are engraved erect</td></tr>
<tr><td>Prism is provided to take the reading</td><td>No prism is provided</td></tr>
<tr><td>Graduation are marked 0 to 360 in clockwise direction</td><td>Graduation are marked 0 to 90 in each quadrant</td></tr>
<tr><td>Tripod may or may not be provided</td><td>Instrument cannot be used with out</td></tr>
</table>
</td>
<td>1
1
1
1
1
1
1</td>
<td>7</td>
<td>7</td>
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		tripod			
	It measures WCB of a line	It measures QB of a line			

III. 5	<A = BB of EA – FB of AB = 130°30’ – 64°30’ = 66°0’	1	7	7
	<B = BB of AB – FB of BC = 244°30’ – 130° = 114°30’	1		
	<C = BB of BC –FB of CD = 310°- 47° = 263° (exterior angle)	1		
	<D = BB of CD –FB of DE = 227°- 210°30’ = 16°30’	1		
	<E = BB of DE –FB of EA = 30°30’- 310°30’+360° = -280°+360° = 80°	1		
	Check			
	Sum of interior angle of closed traverse = (2n – 4) x 90 = 540°	1		
	<A+<B+<C+<D+<E = 540°	1		

	Line	Observed bearing	Correction	Corrected bearing	Remarks			
III. 6							7	7
	AB	45°45’	0 at A	45°45’	Stations B			
	BA	226°10’	-25’ at B	225°45’	and C are	1		
	BC	96°55’	-25’ at B	96°30’	affected	1		
	CB	277°5’	-35’ at C	276°30’	by local	1		
	CD	29°45’	-35’ at C	29°10’	attraction	1		
	DC	209°10’	0 at D	209°10’		1		
	DE	324°48’	0 at D	324°48’		1		
	ED	144°48’	0 at E	144°48’		1		

	Point	B.S	I.S	F.S	H.I	R.L	Remarks			
III. 7									7	7
	A	-2.232			60.888	63.120	B.M	2		
	P	1.328		1.034	61.182	59.854		2		
	B			-4.124		65.306	T.P 1	1		
								1		
	Check	-0.940 -3.090		-3.090		65.306- 63.120		1		

	+2.186				2.186	Checked

III. 8

Station	BS	IS	FS	Rise	Fall	RL	Remarks		7	7
1	2.285					232.46	BM1			
2	1.650		**2.265**	0.02		232.48		1		
3		2.105			**0.455**	232.025		1		
4	**1.625**		1.960	**0.145**		232.17		2		
5	2.050		1.925		0.300	231.87				
6		**1.665**		**0.385**		232.255		2		
7	1.690		**1.325**	0.340		232.595	BM2	1		
8	2.865		2.100		**0.410**	232.185				
9			**1.625**	**1.240**		233.425	BM3			

Check

$\sum BS - \sum FS = 0.965$ $\sum RISE - \sum FALL = 0.965$

Last RL – First RL = 0.965

III. 9 7 7

Types of level 1

1. Dumpy level
2. Wye or Y level
3. Cooke's Reversible level
4. Cushings level
5. Tilting level 6
6. Auto level

	Explanation of any 2	2x3 =6		
III. 10	Reciprocal levelling If levelling across obstacles like river, ravine is required, it is not possible to balance foresight and backsight to get rid of errors due to non parallelismof plane of collimation and axis of bubble tube and also due to curvature and refractions. In such situations reciprocal levelling can be used True difference in level between 2 points = $\frac{(ha-hb)+(ha'-hb')}{2}$ Figure and explanation	2 ~~2~~ ~~3~~ 2 3	7	7
III. 11	An instrument is said to be in perfect adjustment if its various parts maintain their true positions relative to each other Required permanent adjustments in dumpy level 1) Axis of the bubble tube should be perpendicular to the vertical axis 2) The horizontal cross hair should lie in a plane perpendicular to the vertical axis 3) The line of sight (line of collimation) should be parallel to the axis of bubble tube Adjustment of level tube Adjustment of cross hair ring Adjustment of line of sight / collimation (Explain in detail)	1 ~~2~~ ~~2~~ ~~2~~ 2 2 2	7	7

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<tr><td>III.
12</td><td>
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<tr><th>S.No.</th><th>B.S.</th><th>I.S.</th><th>F.S.</th><th>H.I.</th><th>R.L.</th><th>Remarks</th></tr>
<tr><td>1</td><td>1.895</td><td></td><td></td><td>32.395</td><td>30.500</td><td>BM</td></tr>
<tr><td>2</td><td></td><td>1.5</td><td></td><td></td><td>30.895</td><td></td></tr>
<tr><td>3</td><td></td><td>1.865</td><td></td><td></td><td>30.530</td><td></td></tr>
<tr><td>4</td><td>2.990</td><td></td><td>2.570</td><td>32.815</td><td>29.825</td><td></td></tr>
<tr><td>5</td><td>2.410</td><td></td><td>2.020</td><td>33.205</td><td>30.795</td><td></td></tr>
<tr><td>6</td><td>2.960</td><td></td><td>2.520</td><td>33.645</td><td>30.685</td><td></td></tr>
<tr><td>7</td><td></td><td></td><td>3.115</td><td></td><td>30.530</td><td></td></tr>
<tr><td></td><td>10.255</td><td></td><td>10.225</td><td></td><td></td><td></td></tr>
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∑BS - ∑FS = Last RL – First RL = 0.03</td><td></td><td>7</td><td>7</td></tr>
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