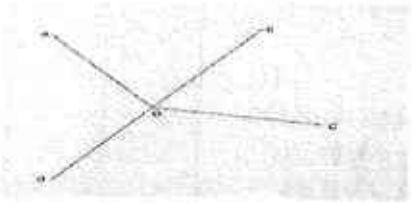
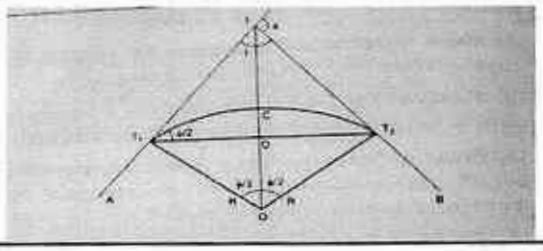
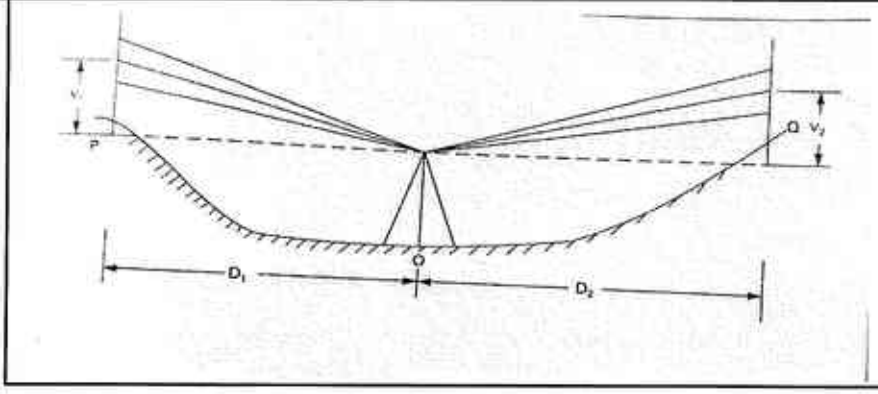
SCHEME OF VALUATION				
(Scoring Indicators)				
Revision: 2021				
Course Name: ADVANCED SURVEYING				
Course Code: 3011		QID:		
Qst. No	Scoring Indicator	Split up Score	Sub Total	Total
I	PART A			9
1)	The process of turning the telescope about the vertical axis in a horizontal plane		1	
2)	The vertical distance between any two consecutive contours is known as the contour interval.		1	
3)	Deflection angle.		1	
4)	Degree of curve,Radious of curve		1	
5)	Electronic distance measurement.		1	
6)	Prisam.		1	
7)	I aerial photograph the point immediately below it on the ground is known as ground Nadir point.		1	
8)	Geographic Information System		1	
9)	photogrammetry.		1	
II	PART B			24
1)	1.Setting up:Setup instument at the station 2.Centering:Centering the instrument 3.Levelling up: Levelling the instrument. 4.Elimination of parallax-a)focussing the eye piece b)focussing the objective.		3	

2)	USES OF CONTOURS: (1)By inspection of a contour map, information regarding the character of the tract of the country is obtained whether it is flat, undulating or mountainous etc. (2) Selection of Sultable Site: The contour map will help in the preliminary selection. (3)Earth Work: The quantities of earth work may be computed from the contour maps. (4) Area of drainage basin (5) Intervisibility between Two Points: (6) Location of a Route: (7) Military operations can be planned with the help of contour maps	1 marks for 1 points	3	
3)	OPEN TRAVERSE: The first and last line of traverse are not connected.CLOSED TRAVERSE: The first and last line of traverse are joined together.		3	
4)	Length = √{∑L2+∑D2} Length =√{(-60)^2+(+80)^2} =100 m , TanΘ= ∑D/∑L ,=80/60, Θ = 57°7 ′ 48.′′, WCB=126°52 ′11′′		3	
5)	1.Circle Eccentricity 2.Horizontal Collimation Error in Total Station 3. Height of Standards Error in Total Station.(or any other relevant points)	1 marks for 1 points	3	
6)	Electronic distance measurement (EDM) is a method of determining the length between two points, using phase changes, that occur as electromagnetic energy waves travels from one end of the line to the other end.	1 marks for 1 points	3	
7)	MEASUREMENT OF DISTANCE WITH TOTAL STATION: In the case it has a laser transmitter and receiver .Laser is emitted and it strikes a target usually prism and it is received and intrepeted as distance. Slope distance between the Instrument and target is measured and horizontal distance is then deduced using inbuilt microprocessor	1 marks for 1 points	3	
8)	Aerial photogrammetry :Cameras fit to a machine that flies take pictures, and with the system, these pictures are used to generate measurements. Terrestrial photogrammetry:In this kind of photogrammetry, a camera is used in a stationary position. The camera is positioned on an elevated level.	1.5X2	3	

9)	1. As a tracking device 2. Provides latitude longitude and altitude information 3. Aids navigation in vehicles, aircrafts and ships (This or any other relevant	1x3 mark	3	
10)	A drone survey refers to the use of a drone, or unmanned aerial vehicle (UAV), to capture aerial data with downward-facing sensors, such as RGB or multispectral cameras, and LIDAR payloads.... These maps can also be used to extract information such as highly-accurate distances or volumetric measurements.		3	
III	**PART C**			42
1)			7	
	The procedure is as follows. 1. The theodolite is set up at o and all the temporary adjustments are made. The reading on vernier 'A' is then adjusted to 0°-0'-0" and the object 'A' is bisected with the help of lower clamp and lower tangent screw. Lower clamp is then tightened. 2. The upper clamp is then released and the telescope is rotated in horizontal plane in clock wise direction and the next object B is bisected exactly by upper clamp and upper slow motion screw. 3. Both the verniers are then read and the average of these two readings will be required angle AOB. 4. The above procedure is repeated to bisect the objects C and D in succession and both the verniers are read and the corresponding included angles are worked out. 5. Lastly the horizon is closed by bisecting the same initial object P. The final reading now should be the same as the initial one. 6. If not discrepancy is noted and equally distributed in all angles. If the discrepancy is beyond the permissible limits the above readings are to be deleted and new set of readings are to be taken. 7. With the changed face the whole procedure is repeated and the required angles are obtained. 8. The mean of the above two sets of observations gives required horizontal angles, the readings are entered in a tabular form.	4 ~~7x1~~		

	Error Eliminated by Reiteration Method : 1. Graduation errors are eliminated. 2. Error due to non adjustment of line of collimation and horizontal axis are eliminated by taking face left and face right observations. 3. Eccentricity of vertical axis is eliminated. 4. Errors of bisection and improper centering are also eliminated.	3		
2)	**Charactreristics of contour** 1) The contour lines are closed curves they may close on the map itself or out side the map depending upon the topography. (2) The spacing between the contour lines depends upon the slope of the ground.In steep slopes the spacing is small and for gentle slopes the spacing is large. (3) If the contour lines are equally spaced they indicate a uniform slope. (4) If the contour lines are parallel, straight and equally placed, they represent a plane surface. 5) A ridge line (water shed line) is indicated whe the values inside the bend or loop are higher where as a valley line' is indicated when lowe values are inside the bend or loop. Ridge line is obtained by joining top most points of a hill where as valley line is obtained by joining the bottom most points of valley. (6) A contour line has its own elevation and therefore two contour lines having different elevations will never intersect each other, except in case of an over hanging cliff. (7)When horizontal equivalent between the contour lines is zero they coincide to form one line and indicate a vertical cliff. (8) A series of closed contour lines on the plan or map indicate either a hill or depression. In case of hill the values of elevation go on increasing towards the centre where as in case of depression these values go on decreasing towards the centre.	1x7	7	

3)	FUNDAMENTAL LINES OF A THEODOLITE : The fundamental lines of a transit theodolite are 1. The vertical axis. 2. The axes of plate levels. 3. The line of collimation also called the line of sight. 4. The horizontal axis also called as Trunion or transverse axis. 5. The bubble line of the altitude level or telescope level. **Conditions of Adjustment:** 1. The axes of the plate levels must be perpendicular to the vertical axis. 2. The line of collimation must be at right angles to the horizontal axis. The optical axis, the axis of the objective slide, and line of collimation must coincide for any position of the objective. 3. The horizontal axis must be perpendicular to the vertical axis. 4. The axis of the telescope level or the altitude level must be parallel to the line of collimation. 5. If the transit has a fixed vertical vernier, the vertical circle vernier must read zero when the telescope level is centered (ce) when the line of collimation is horizontal. 6. If the transit is provided with a striding level, the axis of the striding level must be parallel to the horizontal axis.	4 3	7	
4)	Capacity of Reservoir by Trapezoidal rule V = H/2[A1 + An + 2(A2 + A3.,. .....An-1] Capacity of reservoir By Prismoidal rule V =H/3 [A1 + An +4(A_2+ A4 + A6.....) + 2[A3 + A5+.....]] (a) Volume according to trapezoidal formula =(5/2)x((2,050 + 31, 500)+ 2(8, 400+ 16, 300 + 24, 600)) =330,375m^3 (b) Volume by prismoidal formula: =(5/3)x((2,050 + 31, 500)+ 4 (8 400 + 24, 600) + 2 (16,300)) =330,250m^3	2 2 1.5 1.5	7	
		2		

5)	ELEMENTS OF CIRCULAR (1) Back Tangent :- The tangent AT, previous to the curve is called back tangent or first tangent. (2) Forward Tangent :- The tangent TB following the curve is called forward tangent or second tangent. (3) Point of Intersection :- If the two tangents AT and BT, are produced they will meet at a point called the point of intersection (PI) i.e. at I. (4) Angle of Intersection: The angle between the back tangent IT, and the forward tangent IT. (5) Point of Commencement (PC): The point T, where the curve originates from the back tangent is called the point of commencement of the curve. It is also known as point of curve. (6) Point of Tangency :- The point T, where the curve joins the forward tangent is called point of tangency. (7) Tangent Distances :- The distance between the point of intersection and point of commencement of the curve or the distance between the point of intersection and point of tangency are called the tangent distances. (i.e.) IT, and IT, (8) Length of the Curve: The total length of the curve from the point of commencement to the point of tangency is called the length of the curve.(9) Long Chord - The line Joining the point of commencement to point of tangency is called long chord. (10) Mid Ordinate :- The ordinate joining the mid point of the curve and long chord is called mid-ordi- nate.	3	7	
	(a) Length of the curve T,C T_2 =(πRD/180) (b) Tangent length (T). = TI = IT, = R tanD /2 (c) Length of long chord (L)= T, T_2 = 2R sin/2 (d) Apex distance or external distance (e)Apex distance 'E'= CI= IO-CO= R (secD/2 - 1) (f)Mid ordinate = R (1 - cosD/2)	2		
		2		

6)	Horizontal distance = K Scos²Δ Vertical distance = K S sin 2Δ / 2 D_1 = KS, cos²Δ ,= 100 x 2.250 x cos² 9 - 30 = 218.870 D_2 = KS, cos²Δ ₂ = 100 x 2.055 x cos² 6° = 203.254 PQ = D_1 + D_2 = 218.870 + 203.254 = 422.124 V_1 = KS, sin 2Δ /2 = 100 x 2.250 x sin 12 °/ 2 = 36.626m V_2 = KS_2 sin 2Δ /2 =100 × 2.055 ×sin12°/2 = 21.362 Let Height of the Instruments at O be = x. R.L of P = 350.50 = x + V, -h,. =x+36.626-2.105 = x + 34.521 x=350.50-34.521 = 315.979 R.LQ-=15.979 + V_2- h_2 =315.979+21 362 -1.875 = 335.466 m	2.5 4 2.5	7	
7)	By Back Bearing Method: 1. 'Set up the instrument at A and level it observe the fore bearing of AB.' 2. Move the instrument and set it up at B and level it. 3. Calculate the back bearing of line AB from its fore bearing. Release the upper clamp. Set the vernier A to read the back bearing of AB using upper clamp and upper tangent screw. 4. Release the lower clamp and take a back sight on 'A'. Bisect 'A' exactly using the upper tangent screw. The instrument is now oriented and line of sight is directed along BA. 5. Unclamp the upper plate and rotate the telescope clock wise in horizontal plane until it is directed towards C. Bisect C exactly using the upper tangent screw.The reading on the vernier 'A' gives the bearing of line BC Repeat the above process at all other stations. Always set the vernier 'A' to the back bearing of the preceding line at each station for orientation before taking foresight on forward station.	7	7	

			Consecutive coordinates		Independent coordinates			
	Station	Side	Latitude (y)	Departure (x)	Latitude (y)	Departure (x)		
	A				+200.00	+100.00	4	
	B	AB	+225.5	+120.5	+425.50	+220.50		
	C	BC	−245.0	+210.0	+180.50	+430.50		
	D	CD	−150.5	−110.5	+30.00	+320.00		
	A	DA	+170.0	−220.0	+200.00	+100.00		
8)	Calculation of Traverse Area from Coordinates: The independent coordinates of the most westerly station A are assumed to be (+200.+100). Thus the independent coordinates of all the station become positive ie they come to the first quadrant. [P=(200*220.5)+(425.5*430.5)+(180.5*320)+(30*100) ΣP = 288037.75 EQ (100*425.5)+(220.5*180.5)+(430.5*30)+(320*200) ΣO = 159265.25 Required Area = EΣP - ΣOY Required Area = *(288037.75-159265.25) Required Area = 64386.25 m²						3	7	
9)	Total station is a surveying equipment combination of Electromagnetic Distance Measuring Instrument and electronic theodolite. It is also integrated with microprocessor, electronic data collector and storage system. The instrument can be used to measure horizontal and vertical angles as well as sloping distance of object to the instrument. Data collected and processed in a Total Station can be downloaded to computers for further processing. Total station is a compact instrument and weighs 50 to 55 N. A person can easily carry it to the field. The components used in Total station surveying are as follows: 1. A tripod is used to hold the total station 2. An electronic notebook used to record, calculate and even manipulate the field data 3. Prism and prism pole which can measure lengths up to 2 km and up to 6-7 km can be measured with triple prism 4. Battery						3	7	

		4		
10	1. Fix the total station over a station and level it 2. Press the power button to switch on the instrument. 3. Select MODE B -------> S function------>file management-----> create(enter a name) accept 4. Then press ESC to go to the starting page 5. Then set zero by double clicking on 0 set(F3) 6. Then go to S function ------ measure----> rectangular co-ordinate----->station-->press enter 7. Here enter the point number or name, instrument height and prism code. 8. Keep the reflecting prism on the first point and turn the total station to the prism focus it and bisect it exactly using a horizontal and vertical clamps. 9. Then select MEAS and the display panel will show the point specification 11. Now select edit and re-enter the point number or name point code and enter the prism height that we have set. 12. Then press MEAS/SAVE (F3) so that the measurement to the first point will automatically be saved and the display panel will show the second point. 13. Then turn the total station to second point and do the same procedure. 14. Repeat the steps to the rest of the stations and close the traverse 15. Now go to S function view/edit----graphical view./edit ---> graphical view16. It will show the graphical view of the traverse. (or ~~other~~ similar procedure using any other instrument)	3 4	7	
	here are three segments of G.PS: 1. Space 2. Control 3. User **The space segment** consists of 24 satellites , circular orbits in six orbital planes with an orbital inclination at 55 degree and at 20,200 km above the earth. The orbital period is exactly 12 hours of sidereal time . The operational G.PS satellite has design life of 7.5 years. The satellites are	4		

11)	spaced in orbit so that at any time a minimum of 4 satellites will be in view to users any where in the world. **The control segment** consists of a master control station in colorado springs, colorado with five monitor stations and three control up link stations located throughout the world. Monitor stations track all G.P.S satellites in view and collect ranging information from the satellite broadcasts. The monitor stations send information they collect from each of the satellites back to the master control station which computes extremely precise satellite orbits. The information is then formatted into updated navigation message . **User Segment:**Appropriate G.PS receivers are required to use G.P.S signals for navigation and positioning. The user segment consists of the receivers processors and antennas that allow land, sea or airborne operators to receive the G.PS satellite broadcasts and compute their precise position, velocity and time.	6	7	
12	information about objects, occurrence or area without having physical contact with it. There are various applications of remote sensing which may be grouped into the following: 1. Resource Exploration 2. Environmental Study 3. Land use.4. Site Investigation 3. Archaeological Investigation and 6. Natural Hazards Study	2 4	7	