Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

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Fourth Semester B.E. Degree Examination
Advanced Surveying

TIME: 03 Hours   **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

		Module -1	*Bloom's Taxonomy Level	Marks
Q.01	a	Define the following terms with reference to the theodolite: i) Transiting; ii) Swinging; iii) Changing of face; iv) Horizontal axis	L1	04
	b	Describe the measurement of horizontal angle by repetition method. What are the errors eliminated by repetition method?	L2, L3	10
	c	What are the fundamental lines of a theodolite? State the desired relationship between them.	L1, L3	06
		OR		
Q.02	a	Explain the adjustment of horizontal axis of a transit theodolite by the spire test.	L4	06
	b	Derive the expression for determining the distance and elevation of an inaccessible object by single plane method. Assume the instrument near the object is at higher level than faraway instrument position.	L5	06
	c	Find the elevation of top of chimney from the following data <table><tr><td>Instrument station</td><td>Reading on BM</td><td>Angle of elevation</td><td>Remarks</td></tr><tr><td>A</td><td>0.862</td><td>$18^0 36'$</td><td>RL of BM = 425.250 m</td></tr><tr><td>B</td><td>1.222</td><td>$10^0 12'$</td><td>Distance AB = 50m</td></tr></table> Also calculate the distance of chimney from station B.	L4	08
		Module-2		
Q. 03	a	Explain fixed hair method and movable hair method of tacheometry	L2	06
	b	Derive the tacheometric equation for horizontal line of sight.	L5	06
	c	A tacheometer is setup at an intermediate point on a traverse PQ. The following observations are made on the vertically held staff. <table><tr><td>Staff station</td><td>Vertical angle</td><td>Staff intercept</td><td>Axial hair reading</td></tr><tr><td>P</td><td>$8^0 36'$</td><td>2.350</td><td>2.105</td></tr><tr><td>Q</td><td>$6^0 6'$</td><td>2.055</td><td>1.895</td></tr></table> The instrument was fitted with an anallactic lens and having constant 100. Compute the length of PQ and RL of Q. RL of P is 321.50m	L4	08
		OR		
Q.04	a	What are the various points to be considered while selecting triangulation stations?	L2	06
	b	With neat sketches briefly explain the various triangulation figures adopted in triangulation survey.	L2	08
	c	Write a note on Satellite station and Reduction to centre.	L2	06

		Module-3		
Q. 05	a	Derive the expressions for the following elements of a simple circular curve. i) Tangent length, ii) Long Chord, iii) Mid ordinate	L5	06
	b	Two roads having a deviation angle of 45° at apex point *V* are to be joined by a 200 m radius circular curve. If the chainage of apex point is 1839.2 m, calculate necessary data to set the curve by ordinates from long chord at 10 m interval	L4	06
	c	Two tangents intersect at the chainage 1190 m, the deflection angle being 36°. Calculate all the data necessary for setting out a circular curve with radius of 300 m by Rankine's method of deflection angles method. The peg interval is 30 m.	L4	08
		OR		
Q. 06	a	Two parallel straights 12mts apart are to be connected by a reverse curve. If the distance between the tangent points is 75mts. Find the common radius of the two branches.	L4	06
	b	What are the functions and requirements of a transition curve?	L2	06
	c	A transition curve is required for a circular curve of 250metre radius. The gauge being 1.676m and the super elevation is restricted to 15cm. the transition is to be designed for a velocity such that no lateral pressure is imposed on rails and the rate of gain of radial acceleration is 30m/sec³. Calculate the required length of transition curve and the design speed.	L4	08
		Module-4		
Q. 07	a	Explain briefly the different types of aerial photograph.	L2	06
	b	Derive the expression for scale of an aerial photograph	L5	04
	c	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.	L4	10
		OR		
Q. 08	a	Briefly explain the procedure involved in aerial survey.	L3	06
	b	Write short note on (i) Stereoscope (ii) Parallax Bar.	L2	08
	c	The scale of an aerial photograph is 1 cm = 100 cm and photograph size is15 cm x 15 cm. Determine the number of photographs required to cover an area of 15 km x 15 km if longitudinal lap is 60% and side lap is 30%.	L4	06
		Module-5		
Q. 09	a	What is total station? What are the advantages and disadvantages of total station?	L1,L3	06
	b	Explain the various stages of idealized remote sensing system.	L2	08
	c	Explain the interaction of Electro Magnetic Waves with atmosphere.	L2	06
		OR		
Q. 10	a	What is GPS? Briefly explain the components of GPS.	L1,L2	10
	b	Briefly explain the components of GIS. Also list the applications of GIS.	L2,L3	10

*Bloom's Taxonomy Level: Indicate as L1, L2, L3, L4, etc. It is also desirable to indicate the COs and POs to be attained by every bit of questions.