INSTITUTE OF AERONAUTICAL ENGINEERING
(Autonomous)

Four Year B.Tech III Semester End Examinations (Supplementary) - July, 2018

Regulation: IARE – R16

SURVEYING

Time: 3 Hours   **(CE)**   **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

UNIT – I

1. (a) Define Surveying. What are the principles of Surveying? Explain them briefly. **[7M]**

    (b) A line AB between the stations A and B was measured as 348.28 m using a 20 m tape, too short by 0.05 m. **[7M]**

       i. Determine the correct length of AB,

       ii. The reduced horizontal length of AB if AB lay on a slope of 1 in 25,

2. (a) Describe the various methods of chaining on a sloping ground with neat sketch. **[7M]**

    (b) The fore bearings and back bearings of the lines of a closed traverse ABCDA were recorded as shown in Table 1: **[7M]**

Table 1

Line	Fore bearing	Back bearing
AB	$77^0 30'$	$259^0 10'$
BC	$110^0 30'$	$289^0 30'$
CD	$228^0 00'$	$48^0 00'$
DA	$309^0 50'$	$129^0 10'$

Determine which of the stations are affected by local attraction and compute the values of the corrected bearings.

UNIT – II

3. (a) Define Contour Interval. Explain characteristics of Contour with neat Diagrams. **[7M]**

    (b) The following consecutive readings were taken with a level on continuously sloping ground at a common interval of 20 m. The last stations have an elevation of 155.272 m. Rule out a page of level book and enter the readings. Calculate **[7M]**

       i. The reduced levels of the points by rise and fall method

       ii. The gradient of the line joining the first and last points for the following data
         0.420, 1.115, 2.265, 2.900, 3.615, 0.535, 1.470, 2.815, 3.505, 4.445, 0.605, 1.925, 2.885.

4. (a) Define i) Levelling ii) Bench Mark iii)Fore Site iv) Back Site v) Datum Line vi) Line of Collimation vii) Axis of telescope **[7M]**

   (b) A page of level book is reproduced as shown in Table 2 in which some readings marked as($\times$), are missing. Complete the page with all arithmetic checks. **[7M]**

Table 2

Station	B.S.	I.S.	F.S.	Rise	Fall	R.L.	Remarks
1	3.150				$\times$		
2	1.770		$\times$		0.700	$\times$	C.P.
3		2.200			$\times$	$\times$	
4	$\times$		1.850	$\times$		$\times$	C.P.
5		2.440			0.010	$\times$	
6	$\times$		$\times$	1.100		$\times$	C.P.
7	1.185		2.010	$\times$		222.200	C.P.
8		-2.735		$\times$		$\times$	
9	$\times$		1.685		4.420	$\times$	C.P.
10			1.525		0.805	$\times$	
$\sum$	12.055		$\times$	$\times$			

UNIT – III

5. (a) List various methods available for finding the areas consisting regular boundary and irregular boundary. Define Simpson's rule and derive the equation to finding the area. **[7M]**

   (b) The road embankment 10m wide at formation level with side slopes 2:1 and with an average height of 5m is constructed with an average gradient 1 in 40 from contour 220m to 280m. Calculate
   i) Length of the road **[7M]**
   ii) Volume of embankment in m^3.

6. (a) The width of a certain road at formation level is 9.50 m with side slopes 1in 1 for cut and 1 in 2 for filling. The original ground has a cross-fall of 1 in 5. If the depth of excavation at the center line of the section is 0.4 m, calculate the areas of the cross-section in cut and fill. **[7M]**

   (b) A series of offsets were taken from a chain line to a curved boundary at intervals of 10m in the following order 2.30 ; 3.80 ; 4.55; 6.75 ; 5.25 ; 7.30 ; 8.95; 8.25 and 5.50m. Compute the area using Trapezoidal and Simpson's rule. **[7M]**

UNIT – IV

7. (a) Describe the following with respect to theodolite: i. Centering ii. Transiting iii. Face left observations iv. Face right observations v. Swinging vi. Telescope normal vii. Telescope inverted. **[7M]**

   (b) Find the reduced level of top of a telecommunication tower 'P' from the following observations made from two stations A and B. P, A and P, B are on single plane. A and B are 50m apart. Angles measured from the stations A and B to the top of the tower was 27^0 and 24^0 respectively. The staff reading from A on a benchmark of RL 812.345 m was 2.565 m and from B was to the benchmark was 1.255 m. **[7M]**

8. (a) State the different axis of a vernier transit theodolite and explain the procedure for measuring horizontal and vertical angles. **[7M]**

   (b) Derive the horizontal distance between A and B and R.L of the top of the chimney when the height of instrument at B is lower than that of A. (Instrument stations and object are in the same vertical plane). **[7M]**

UNIT – V

9. (a) What is the field procedure to set out a simple circular curve by Rankin's method? Explain with neat sketch. **[7M]**

   (b) What are the various components in Total station? Also write the advantages and disadvantages of Total station. **[7M]**

10. (a) Derive the expression to find out distance when staff held vertical for angle of elevation and depression using tachometric principles. **[7M]**

    (b) Write a note of GPS and GIS. Elaborate on the applications of GPS and GIS in civil engineering. **[7M]**

$- \circ \circ \bigcirc \circ \circ -$