Code No: R1621015 **R16** SET - 1

II B. Tech I Semester Regular Examinations, October/November - 2017
SURVEYING
(Civil Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) List the reasons for incorrect length of chain? (2 M)
   b) List the fundamental lines of Dumpy Level? (2M)
   c) Define the term "contour"? (2M)
   d) Define the terms : i)Transiting ii)Swinging face left iii)Face Right (3 M)
   e) Define the terms "Compound Curve" (3 M)
   f) Write the formula for Simpson's rule? (2M)

PART -B

2. a) A 20 m chain was found to be 15 cm too long after chaining a distance of 1600 m. It was found to be 30 cm too long at the end of day's work after chaining a total distance of 3200 m. Determine the correct distance if the chain was correct before the commencement of the work. (7M)
   b) State the reasons for incorrect length of Chain? (7M)

3. a) Find the angles between the lines AB and AC, If their respective bearings are 35^0 40' and 142^0 20'? (7M)
   b) Differentiate between (7M)
   i)True meridian and Magnetic Meridian ii) Declination and Dip

4. a) Describe the profile leveling method? (7M)
   b) Find out the missing (?) F.S and B.S values in table of a Leveling field book given . (7M)

Station	B.S	I.S	F.S	Rise	Fall	Remarks
1.	4.550					Starting Point
2.	2.125		?		0.750	Change Point
3.		2.225				
4.	?		1.975			Change Point
5.		2.445		1.500		

5. a) How to calculate the area of closed traverse from the rectangular co - ordinates? (7M)
   b) State the Principle of tachometric Surveying? (7M)
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6. a) Two straights of a circular curve meet at an intersection angle of 65^0 and the length of the long chord is 130 m. Find out the Tangent length, apex distance, and rise in meter of curve? (7M)
   b) Explain the method of setting out curve by Chord and Angle method? (7M)

7. a) Explain the Double Meridian Distance (D.M.D) method for the computation of area of a closed traverse? (7M)
   b) The following perpendicular offsets were taken at 5 m intervals from a traverse line to an irregular boundary line (7M)

   2.10; 3.15; 4.50; 3.60; 4.58; 7.85; 6.45; 4.65; 3.14 m.

   Compute the area enclosed between the traverse line and the irregular boundary from the first to the last offset.

Code No: R1621015 **R16** SET - 2

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SURVEYING
(Civil Engineering)

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3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) What do you mean by plane surveying? (2 M)
   b) Define the term 'Magnetic declination" (2M)
   c) Define the term "Reduce Level" (2M)
   d) State the rules for distribution of error of closure? (3 M)
   e) Define the term "Super elevation"? (3 M)
   f) List the methods of calculation for volume of barrow pits? (2M)

PART -B

2. a) List the instruments for Direct measurement of Distances? (7M)
   b) Give the broad classification of Surveying? (7M)

3. a) In a triangle ABC, The bearings of the sides AB, BC ,and CA are 60^0,130^0 and 270^0 respectively. Calculate the Interior angles A,B, and C in degrees? (7M)
   b) Find out the missing figures and complete the level book page. Apply usual arithmetic check. (7M)

B.S	I.S	F.S	H.I	R.L	Remarks
4.390			×	×	Point1
	×			192.00	Point2
3.910		6.520	×	×	Point3
	5.390			191.620	B.M
	4.730			×	Point4
	×			203.300	Point5 staff inverted
4.330		×	×	×	Point 6
		2.990		194.830	Point 7

4. a) Discuss the characteristics of contours, give suitable sketches. (7M)
   b) Describe the method of Reciprocal leveling. (7M)
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5. a) The following fore and back bearings were observed in traversing with a compass

Line	**F.B**	**B.B**
AB	S45°00¹E	N45°00¹W
BC	N60°30¹E	S60°30¹W
CD	N5°30¹E	S5°30¹W
DE	N65°30¹W	S65°30¹E
EA	S40°00¹W	N40°00¹E

Compute the included angles of the traverse

b) Explain the procedure of running a traverse by the method of included angles. (7M)

6. Write short notes on the following (14M)
a) Elements of a compound curve
b) Reverse Curve

7. a) The following perpendicular offsets were taken at 5 m intervals from a traverse line to an irregular boundary line (7M)
2.10; 3.15; 4.50; 3.60; 4.58; 7.85; 6.45; 4.65; 3.14 m.
Compute the area enclosed between the traverse line and the irregular boundary from the first to the last offset.

b) Calculate the side widths and cross-sectional areas of cut and fill in a side hill (7M)
Section having the following dimensions.
Centre height in cut :1m
Formation width :22m
Side slope in cut :1 to 1
Side slope in fill :2 to 1
Transverse slope : 5.5 to 1

Code No: R1621015 **R16** SET - 3

II B. Tech I Semester Regular Examinations, October/November - 2017
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2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1. a) State the Principles of Surveying (2 M)
   b) Define Azimuth (2M)
   c) Define the term Levelling? (2M)
   d) List the method of traversing with theodolite? (3 M)
   e) Classify the Curves? (3 M)
   f) Write the formula for area of Triangle (2M)

PART -B

2. a) Discuss briefly the classification of surveying based on purpose and Instruments.? (7M)
   b) A 30m tape standardized in catenary as 29.990m at 100N is used in the field with a tension of 80 N in catenary. Calculate the Sag correction if the mass of the tape is 0.33 kg per m. (7M)

3. a) Discuss basic objective of survey and (7M)
   Convert the following W.C.Bs into Q.Bs
   i) 54^0-30' ii) 132^0 iii) 243^0-30' iv) 315^0-00
   b) Explain the effects of curvature and refraction in Levelling? (7M)

4. a) What is a contour line? What is the importance of contour maps in Civil engineering works? (7M)
   b) Following are the staff readings taken with a dumpy level. Find the reduced levels of points by line of collimation method if the R.L bench mark is 100.00m (7M)

STATION	B.S	I.S	F.S
P	**1.220**		
A		**1.750**	
B		**1.620**	
Q	**1.110**		**1.545**
C		**1.990**	
D		**1.670**	
E			**1.550**
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5. a) State the Bowdich rule and transit rules of balancing. (7M)

   b) Calculate latitudes ,departures and closing error for the following traverse, and adjust using Bowditch's rule. (7M)

Line	Length(m)	WCB
AB	89.31	$45^0\ 10'$
BC	219.76	72^0 05'
CD	151.18	$161^0\ 52'$
DE	159.10	$228^0\ 43'$
EA	232.26	$300^0\ 42'$

6. a) Write short notes on the following (7M)
   i) Transition Curve
   ii) Super elevation.

   b) Two tangents meet at chainage 1023 metres the deflection angle being 36°.A Circular curve of radius 300m is to be introduced in between the two tangents Calculate the following (7M)
   i) Tangent Length
   ii) Length of Circular curve
   iii) Chainages of the tangent points.

7. a) The following perpendicular offsets were taken from a chain line to an irregular boundary. (7M)

Chainage	**0**	**8**	**20**	**35**	**47**	**60m**
Offsets	**14.5**	**24.5**	**30.8**	**27.4**	**28.4**	**18.4m**

   Compute the area between the chain line ,the boundary and the end offsets. Determine the volume of cut and fill from chainage 0 to 100 m from the three X-sections at chainage 0,45.0, and 100.0 m.

   b) State the determination of capacity of reservoir? (7M)

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2. Answer **ALL** the question in **Part-A**
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PART –A

1. a) Define the term ' Surveying' (2 M)
   b) State the uses of Compass? (2M)
   c) Define the term "Bench Mark"? (2M)
   d) Define terms " Contour interval and "Horizontal equivalent" of contour? (3 M)
   e) Name different methods of Curve ranging. (3 M)
   f) State the mid-ordinate rule of area calculation? (2M)

PART -B

2. a) What are different methods of making linear measurements? Describe briefly (7M)
   b) The length of a line measured with 20 m chain was found to be 372 metres. The true length of the line was known to be 371 metres. Find the error in the chain? (7M)

3. a) The following are the observed fore end back bearings of a closed compass traverse ABC. (7M)

   Calculate the include angles

Line	F.B	B.B
AB	40°	220°
BC	110°	290°
CA	275°	95°

   b) Explain the terms "Local attraction" and "Magnetic declination" (7M)

4. a) Explain the principle of leveling? (7M)
   b) Define the terms "Contour Interval" and "Horizontal Equivalent of Contour"? (7M)

5. a) Describe the Transit Vernier theodolite with sketch. (7M)
   b) The lengths and bearings of the four lines of a closed traverse ABCDE. (7M)

   Determine the length and bearing of the fifth line EA.

Line	Length	Bearing
AB	194.1m	85^0
BC	201.2m	15^0
CD	165.4m	285^0 30'
DE	172.6m	195^0 30^0
EA	?	?

6. a) What is a "Compound Curve "? Describe in a few sentences, how this curve differs from other ones. (7M)

   b) A Circular curve has been set off touching the line AB and BC at points A and C respectively. If the angles CBA is 156° and the minimum distance from point B to the curve is 20 metres, Calculate i) the length of the lines AB and BC and (ii) Area bounded by the lines AB and BC and the Curve. (7M)

7. a) The area with in the contour lines at the site of Abandoned Quarry used as the water reservoir and the face of the proposed dam are as follows; (7M)

Contour in Metres	350	352	354	356	358	360	362
Area in Sq.M	300	10,500	76000	1,45000	270000	4,15000	4,70000

   Taking 350 as bottom level of reservoir and 362 as the F.R.L. Find the volume of water in the reservoir in cubic metres using Trapezoidal rule.

   b) Strata the various methods for computation of areas along irregular boundaries? (7M)