

## SURVEYING – II ( SEMESTER - 4 )

CS/B.TECH (CE)/SEM-4/CE-403/09



1. ....  
Signature of Invigilator

2. ....  
Signature of the Officer-in-Charge

Reg. No.

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Roll No. of the  
Candidate

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CS/B.TECH (CE)/SEM-4/CE-403/09  
ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009  
SURVEYING – II ( SEMESTER - 4 )

Time : 3 Hours ]

[ Full Marks : 70

### INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.  
b) For **Groups – B & C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

**No additional sheets are to be used and no loose paper will be provided**

### FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A								Group – B				Group – C				Total Marks	Examiner's Signature
Question Number																		
Marks Obtained																		

.....  
Head-Examiner / Co-Ordinator / Scrutineer

4529 (10/06)



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**ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009**  
**SURVEYING – II**  
**SEMESTER – 4**

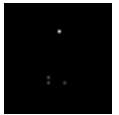


Time : 3 Hours ]

[ Full Marks : 70

**GROUP – A**  
**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10
- i) In a closed traverse, the algebraic sum of departure and latitude must be equal to
- a) 90° b) 180°
- c) 0° d) 270°.
- ii) A theodolite in which the telescope can be revolved through a complete revolution in a vertical plane is known as a
- a) non-transit theodolite
- b) tilting theodolite
- c) transit theodolite.
- iii) The relation between the radius (  $R$  ) and degree (  $D$  ) of a curve is
- a)  $R = D / 1719$  b)  $R = 1719 / D$
- c)  $R / D = 1719$  d)  $D = R / 1719$ .
- iv) The length of a long chord is given by the expression,
- a)  $L = 2R \sin \theta / 2$  b)  $L = 2R \tan \theta / 2$
- c)  $L = 2R \cos \theta / 2$  d)  $L = 2R \sec \theta / 2$ .
- v) The additive constant is denoted by
- a)  $f - d$  b)  $f + d$
- c)  $f / d$  d)  $d / f$ .



- vi) An anallatic lens is provided to make the additive constant 6 equal to

- a) 100                                  b) 0
- c) 90                                     d) 180.



- vii) A curve of varying radius is known as

- a) simple curve                      b) compound curve
- c) reverse curve                     d) transition curve.

- viii) The principle of tachometry is used

- for locating contours
- on hydrographic surveys
- for filling in detail in topographic surveys
- for locating surveys for roads, railways etc.
- all of these.

- ix) The length of peg interval of flat curves is

- a) 15 m                      b) 20 m
- c) 25 m                      d) 30 m.

- x) Agonic line is the line joining points having

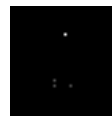
- a) zero declination                      b) minimum declination
- c) maximum declination                d) same declination.

- xii) To determine the length of a bridge proposed to be built across a wide river, the surveying method of choice would be

- a) tachometry                      b) chain surveying
- c) hydrographic surveying       d) triangulation.

- xii) The angle subtended by the long chord of a simple circular curve at its centre is equal to

- a) angle of deflection                      b) two times the angle of deflection
- c)  $180^\circ - \text{angle of deflection}$                       d)  $180^\circ = \text{angle of deflection}/2$ .

**GROUP – B****( Short Answer Type Questions )**Answer any *three* of the following questions.

3 × 5 = 15

2. What is a transit theodolite ? What are the functions of a theodolite ? 2 + 3
3. What do the terms 'Consecutive coordinates' and 'independent coordinates' mean ? 5
4. Write a short note on Shore line surveying. 5
5. Describe the principle of tachometry. 5
6. What are the different methods of curve setting ? What is a transition curve ? Where is such a curve provided ? 3 + 1 + 1
7. Write a note on the application of remote sensing in civil engineering. 5

**GROUP – C****( Long Answer Type Questions )**Answer any *three* of the following questions.

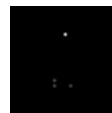
3 × 15 = 45

8. The following are the lengths and bearing of the sides of a closed traverse *ABCD* :

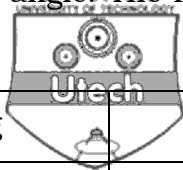
Line	Length in metre	Bearing
<i>AB</i>	78.2	140° 12'
<i>BC</i>	198.0	36° 24'
<i>CD</i>	37.8	338° 48'
<i>DA</i>	?	?

Calculate the length and bearing of line *DA*.

9. Calculate the necessary data to set out a 5° curve between two tangents *AB* and *BC*. Angle of intersection is 144°, Chainage at intersection point 1238 m and Peg interval 30 m.



10. A closed traverse  $DEFGH$  was run by method of included angle. The following are the data collected :



Line	Length in metre	Bearing	Angle
$DE$	170.00	$12^{\circ} 30' 00''$	$D = 120^{\circ} 48' 00''$
$EF$	145.10		$E = 77^{\circ} 41' 50''$
$FG$	193.20		$F = 137^{\circ} 39' 00''$
$GH$	174.00		$G = 69^{\circ} 59' 00''$
$HD$	107.40		$H = 127^{\circ} 48' 00''$

From the above data, calculate the area of traverse using Gale's traverse table.

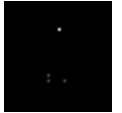
11. What is triangulation ?

Explain the following with sketch :

- Extension of triangle
  - Satellite station
  - Station on scaffold
  - Photogrammetry.
12. To determine the elevation of the first station  $A$  of tachometric survey, the following observations were made, the staff being held vertically. The instrument was fitted with an anallatic lens and the value of the constant was 100.

Inst. station	Height of Instrument	Staff station	Vertical angle	Staff readings	Remarks
O	1.440	B.M.	$-5^{\circ} 40'$	1.332, 1.896, 2.46	R.L. of BM = 158.205 m
O	1.440	C.P.	$8^{\circ} 20'$	0.780, 1.263, 1.746	
A	1.380	C.P.	$-6^{\circ} 24'$	1.158, 1.617, 2.076	

Calculate the reduced level of  $A$ .



13. a) Write Intrinsic equation & tangent length or cubic spiral & cubic parabola.

b) Write shortly on length of transition curve.

c) Describe Tacheometric method of setting out curve.



5 + 5 + 5

14. a) Describe different methods of locating sounding points in a hydrographic survey.

b) Describe the working principle of a nautical sextant.

10 + 5

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END