Reg.No.									

INTERNATIONAL CENTRE FOR APPLIED SCIENCES

(Manipal University)

IV SEMESTER B.S. DEGREE EXAMINATION – APRIL/ MAY 2017

SUBJECT: SURVEYING (CE 232)

(BRANCH: CIVIL ENGINEERING)

Thursday, 27 April 2017

Time: 3 Hours **Max. Marks: 100**

- ✓ **Answer ANY FIVE full Questions.**
- ✓ **Missing data, if any, may be suitably assumed.**
- ✓ **Figures should be neatly drawn.**

1A. Explain the following principles of surveying:

a) Working from whole to part.
b) Location of points by measurement from two points of reference.

1B. In a preliminary survey a line of levels was run from a benchmark of RL 454.650 m, the following readings were obtained.

BS:	2.545	3.865	2.670	1.125
FS:	1.365	2.945	1.855	

From the last position of the instrument five pegs of 20m interval are to be setout on a uniformly rising gradient of 1 in 40. The first peg is to have an RL of 455.110. Workout the staff readings for setting the top of the pegs on the given gradient and enter them in a proper format of page of level book.

(10+10)

2A. Explain in detail the methods of booking and reducing levels.

2B. With the help of neat diagram obtain an expression for the sensitiveness of a bubble tube.

(10+10)

3A. Explain in detail the procedure for measurement of horizontal angle by the following methods:

a) Repetition method.
b) Reiteration method.

3B. Calculate the corrected latitudes, corrected departures and closing error for the following traverse using Bowditch's rule

Line	Length (m)	WCB
PQ	85.67	$42^{O}15'$
QR	225.62	$71^{O}52'$
RS	147.45	$163^{O}40'$
ST	163.32	$232^{O}25'$
TP	236.45	$301^{O}24'$

(10+10)

4A. With the help of neat diagram obtain the expressions for the horizontal distance D and the vertical intercept V by tangential method of tacheometry with targets both at an angle of elevation.

4B. Following readings were taken with a tacheometer from a station. The staff was kept vertical. The values of constant of tacheometer is 100 and fitted with anallactic lens. Find the horizontal distance from A to B and the reduced levels of A and B.
(Instrument A is 1m high from ground)

Station	Staff station	Vertical angle	Hair readings	Remarks
A	BM	- 8°00'	1.100: 1.153: 2.060	RL of BM is 846.000m
	B	+ 10°00'	0.982: 1.085: 1.188	

(10+10)

5A. With the help of neat diagram obtain the expression for tacheometric constants.

5B. With the help of neat diagrams explain the fundamental lines of theodolite.

5C. Explain the following w.r.to a theodolite.

a) Transiting
b) Face left and face right observation
c) Plunging the telescope
d) Vertical axis

(6+10+4)

6A. Explain the basis on which a contour interval is selected.

6B. With the help of required diagrams explain the characteristics of contours.

6C. With the help of neat diagram obtain the required expressions for determining the elevation of the top of the object by trigonometric levelling, when the base of the object is inaccessible but the instrument near the object is at a higher level and are in the same plane.

(5+5+10)

7A. With the help of neat diagram, explain the following terms w.r.to a circular curve.

a) Back tangent
b) Intersection angle
c) Point of curvature
d) Mid-ordinate
e) Tangent distance

7B. Name the elements of a simple curve and write down the expression for finding those.

7C. Two straights AB and BC are intersected by a line MN, the angles AMN and MNC are 145^o and 140^o respectively. The radius of the first curve is 400m and that of second curve is 600m. Find the chainages of the tangent points and the point of compound curvature, given the chainage of point of intersection as 5555m.

(6+4+10)

8A. The chainage of the intersection of the two straights having the deflection angle of 50^o is 1680.50m. If the radius of the curve is 450m, calculate the following:

a) Tangent distance
b) Length of the curve
c) Chainages of Point of Curvature and Point of tangency
d) Length of the long chord
e) Degree of the curve
f) Apex distance
g) Mid-ordinate

8B. Mention the advantages of transition curve.

8C. With the help of neat diagrams show the different types of vertical curves.

(**10+5+5)**