Registration No: | | | | | | | | | | |

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B.TECH
PCI3I102

3rd Semester Regular Examination 2016-17
SURVEYING
BRANCH: CIVIL
Time: 3 Hours
Max Marks: 100
Q.CODE: Y655
Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.

Part – A (Answer all the questions)

Q1 Answer the following questions: **(2 x 10)**

a) A 30 m metric chain is found to be 0.1m too short throughout the measurement. If the distance measured is recorded as 300 m, then actual distance measured will be;
(a) 300.1 m (b) 301.0 m (c) 299.0 m (d) 310.0 m

b) If the declination is $5^0\,40'$ W, which one of the following magnetic bearing would represent the true bearing of $S25^0 20'E$?
(a) $S19^0 20'E$ (b) $S31^0 0'E$ (c) $S20^0 0'E$ (d) $S19^0 20'W$

c) The curvature of the earth is usually taken into account when the extent area is more than;
(a) 50 km^2 (b)100 km^2 (c) 200 km^2 (d) 250 km^2

d) At the equator the dip of the needle is;
(a)180^0 (b) 0^0 (c) 90^0 (d) 45^0

e) Curvature correction to a staff reading in a differential leveling survey is;
(a) always subtractive (b) always zero
(c) always additive (d) dependent on latitude

f) The working principle of optical square is based on;
(a) reflection (b) refraction (c) double reflection (d) transmission

g) A light house is visible just above the horizon at a certain station at the sea level. The distance between the station and the light house is 40 km. The height of the light house is approximately;
(a) 187 m (b) 137.7 m (c) 107.7 m (d) 87.3 m

h) A 15 cm theodolite means;
(a) length of telescope 15 cm (b) height of standards is 15 cm
(c) diameter of lower plate is 15 cm (d) radius of upper plate is 15 cm

i) The real image of the object is formed;
(a) in the plane of cross hairs (b) at the centre of the eye piece
(c) at the centre of telescope (d) in front of the object glass

j) The latitude and departure of a line AB are +78 m and - 45.1 m respectively. The whole circle bearing of the line AB is;
(a) 30^0 (b) 150^0 (c) 210^0 (d) 330^0

Q2 Answer the following questions: (2 x 10)

a) Differentiate between plane and geodetic surveying.
b) What is difference between plan and map?
c) What is meant by well conditioned triangle?
d) What do you mean by normal tension?
e) What is difference between line of collimation and line of sight?
f) What is back sight and fore sight?
g) Draw neat sketches of pattern of contours that show (i) a ridge line (ii) a valley (iii) an overhanging cliff (iv) a pond.
h) What are Isoclinic lines and Isogonic lines?
i) Differentiate between check line and tie line?
j) What is the value of least count for (i) prismatic compass (ii) leveling staff (iii) theodolite?

Part – B (Answer any four questions)

Q3 a) The area of a plot in a map is found, by planimeter, to be 10.22 cm^2. The scale of the map was 1:25000, but at present it is shrunk such that a line originally 5 cm in the map is now 4.8 cm. What is the correct field area in hectares? **(10)**

b) Enumerate the cumulative and compensating errors in chaining. **(5)**

Q4 a) A base line AC was measured in two parts along two straight drains AB and BC of length 1650 m and 1819.5 m with a steel tape which was exactly 30 meters at 25 ^{0}C at a pull of 9 N. The applied pull during measurement of both parts was 200 N where as respective temperatures were 45 ^{0}C and 25 ^{0}C. The slopes of drains AB and BC were 3^0 and 3^0 $30'$ and the deflection angle of BC was 10^0 right. Find corrected length of the base line if the cross section area of the tape was 2.5 mm^2. The coefficient of expansion and modulus of elasticity of tape material were $3.5x10^{-6}$ per 1^0C and $21x10^5$ N/mm^2 respectively. **(10)**

b) A survey line CDE crosses a river, D being on the near bank, and E on the opposite bank. A perpendicular DF = 150 meters is ranged at D on the left. From F bearings of E and C are observed to be 25^0 and 115^0 respectively. If the chainage of C is 1250 meters and that of D is 1620 meters, find the chainage of E. **(5)**

Q5 a) To find out the included angles in a closed survey PQRSTP, the following observations were made with the compass. Calculate the included angles after correcting for local attractions. **(10)**

Line	Fore bearing(FB)	Back bearing(BB)
PQ	N $62^0$45$'$ E	S $62^0$15$'$ W
QR	N $21^0$00$'$ W	S $20^0$45$'$ E
RS	N $71^0$30$'$ W	S $71^0$30$'$ E
ST	S $39^0$00$'$ W	N $38^0$00$'$ E
TP	S $54^0$30$'$ E	N $53^0$15$'$ W

b) Discuss the temporary adjustments of a prismatic compass. **(5)**

Q6 **a)** The following consecutive readings were taken with a level and 4 m leveling staff on a continuously sloping ground at a common interval of 20 meters. **(10)**

0.905(on A), 1.745, 2.345, 3.125, 3.725, 0.545, 1.390, 2.055, 2.955, 3.455, 0.595, 1.015, 1.850, 2.655 and 2.945(on B).

The RL of A was 395.500. Calculate the RLs of different points and find the gradient of the line AB.

b) Compare 'line of collimation' method with 'Rise and Fall' method for reducing levels. **(5)**

Q7 **a)** Reciprocal levels were taken with a dumpy level and following observations were recorded. **(10)**

Instrument near station	Staff reading at station	
	A	B
A	1.225	1.375
B	0.850	0.500

RL of station A is known to be 626.155. Calculate the RL of station B. Also, calculate the error in line of collimation and state clearly whether it is inclined upwards or downwards.

b) What is the sensitivity of the bubble tube? A bubble tube of a level has a sensitiveness of 20" per 2 mm division. Find the error in the reading on the staff held at a distance of 100 m from the level when the bubble is deflected by two divisions from the centre. **(5)**

Q8 **a)** Define contour. What do you understand by contour interval and on what factors does it depend? Give characteristics of contours. **(10)**

b) Write down the various methods for drawing the contour line. What are the uses of contour map? **(5)**

Q9 **a)** The lengths and bearings of a traverse are ABCD are as follows: **(10)**

Line	Lengths(m)	Bearings
AB	250.5	$30^0\,15'$
BC	310.4	$145^0\,30'$
CD	190.2	$222^0\,15'$

Calculate the length and bearing of the line DA.

b) What do you mean by parallax? How elimination of parallax is done? **(5)**