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

Total Number of Pages : 03 **B.Tech.**
PCI4D001

4th Semester Regular / Back Examination 2017-18
ADVANCE SURVEYING
BRANCH : CIVIL
Time : 3 Hours
Max Marks : 100
Q.CODE : C1141
Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1 **Answer the following questions: *multiple type or dash fill up type:*** **(2 x 10)**

a) The point on the celestial sphere vertically below the observer's position, is called
(a) nadir (b) zenith (c) celestial point (d) pole

b) Multiplying constant of Tacheometer is given by (a) i/f (b) f/i (c) f/d (d) d/i

c) The ratio of external distance and the radius is given by
(a) 1-cos I/2 (b) sec I/2-1 (c) 1- tan I/2 (d) None of these

d) Satellite station is required when a main station
(a) cannot be sighted (b) cannot be occupied
(c) both (a) and (b) (d) neither (a) nor (b).

e) Theory of lest square is used in
(a) cannot be sighted (b) cannot be occupied
(c) both (a) and (b) (d) neither (a) nor (b).

f) In a tilted photograph, the tilt is usually less than
(a) 1˚ (b) 2˚ (c) 3˚ (d) 4˚

g) Most accurate method for measurement of Base line is
(a) invar tape method (b) tacheometric method
(c) EDM instrument method (d) plane table method

h) Subtense bar system is generally used for measurement of horizontal distance in
(a) undulating area (b) Mountainous area
(c) Flat area (d) Traingulation

i) The Superelevation(e) can be expressed as
(a) Bv^3/gR (b) Bv^2/gR (c) Bv^2/gR^2 (d) Bv/gR

j) The parallax equation $\Delta p = \frac{Bm\Delta h}{H - h}$ is applicable to entire overlap of the photographs only if parallax is measured
(a) normal to base line (b) parallel to base line
(c) both (a) and (b) (d) neither (a) nor (b).

Q2 **Answer the following questions: *Short answer type:*** **(2 x 10)**

a) What is an anallactic lens? What is the condition under which the additive constant is zero with an anallatic lens?

b) Draw with neat sketch a simple curve showing the elements of it?

c) List the Laws of Weight.

d) Derive the relation between radius and degree of curve.

e) What do you mean by Strength of Figure and what are the factors affecting it?

f) What are the different types of arrangement used in triangulation? What are their relative advantages and disadvantages?

g) Differentiate between fixed hair and movable hair method.

h) A map of area plotted at scale of 1 in 20,000 is available. If the length of a runway on the map is 120mm, determine the scale. The photo distance of the runway is 188mm.

i) Calculate the most probable value and probable error of the area of the triangle rectangle whose sides are as follows:
side a =100±0.02m
Side b =150 ± 0.01m

j) Differentiate between photogrammetry and Remote Sensing.

Part – B (Answer any four questions)

Q3 **a)** The following data (Table 1) were obtained in a tacheometric survey. The staff was held vertically. Multiplying constant = 100 and the additive constant = 0. Height of axis at instrument station P was 1.50 m and the RL of P was 100.00 m. **(10)**

Table 1

Instrument at	Staff at	WCB	Vertical angle	Staff readings (m)		
P	Q	12^0 25'	0^0 0'	1.88	2.25	2.62
	R	60^0 45'	15^0 10'	1.83	2.15	2.47

Determine the distance QR and the difference in elevation between Q and R.

b) The vertical angle to a station B was measured as $16^o 45'$. The staff intercept was 3.15m. The staff was supposed to be held vertical but was out of plumb by 50mm in 4m (away from the observer). Find the error in horizontal distance if K=100 & C = 0. **(5)**

Q4 **a)** Two straight lines intersect at chainage 1150.50 and the angle of intersection is 60°. If the radius of the curve is 500m, determine : **(10)**
(a) Tangent distance
(b) Length of curve
(c) Chainages of the point of curvature and tangency
(d) Length of long Chord
(e) Degree of curve
(f) Apex distance and mid ordinate.

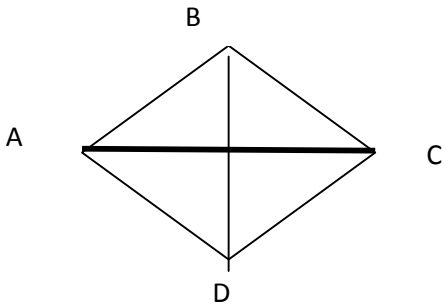
b) Two parallel railway lines are to be connected by a reverse curve. If the center lines are 8m apart, and the maximum distance between tangent points is 32m. Find the maximum allowable radius that can be used **(5)**

Q5 **a)** Directions are observed from a satellite station S, 10m from station A, with the following results **(10)**
A = 00^0 00' 00''
B = 140^0 20' 20''
C = 245^0 30' 25''
D = 305^0 15' 35''
If the lengths of sides AB, AC and AD are 3350.54 m, 4132.43m and 3145.83m respectively. Determine the direction of AB, AC and AD.

b) List the factors considered while selecting the site for base line. **(5)**

Q6 **a)** Find the most probable value of the angles A, B and C of a triangle ABC from the following observations A = 65^0 15' 30'' weight =3 **(10)**
B = 51^0 11' 25'' weight = 2
C = 63^0 32' 34'' weight =4

b) Compute the Strength of figure ABCD for each of the route by which the length BD can be computed from known side AC. All the stations were occupied and all the angles were measured. **(5)**



Q7 **a)** Explain the principle of photogrammetry and stereo-photogrammetry. Explain how an aerial photogrammetric survey is planned and carried out. What are the practical uses of aerial photogrammetry? **(10)**

b) The elevation of three points A, B and C above the datum are respectively 1500m, 1200m, and 1000m. If the flying height above the datum is 3000m, determine the maximum scale, minimum scale and average scale. The focal length of the camera is 150mm. **(5)**

Q8 **a)** Define Remote Sensing and briefly explain the principle of Remote Sensing. Also write a note on application of Remote Sensing. **(10)**

b) Explain the procedure of setting out a building by the method of circumscribing rectangle. **(5)**

Q9 **a)** Describe briefly the raster and vector data structure. Discuss their relative advantages and disadvantages. **(10)**

b) Differentiate between framed system and Scanning system of Remote Sensing. **(5)**