Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CSE)/SEM-4/CE-403/2011

2011

ADVANCED COMPUTER ARCHITECTURE

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A
(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

i) A theodolite can measure

a) difference in level b) bearing of a line

c) zenith angle d) all of these.

ii) Control of survey can be provided by

a) triangulation b) trilateration

c) traversing d) all of these.

iii) Sum of the three angles of spherical triangle

a) is always less than 180°

b) is always more than 180°

c) is equal to 180°

d) is always less than 180°, depending the location of the triangle on spheroid.

iv) The following curve has the property that the rate of change of increase of superelevation

a) reverse curve b) compound curve

c) transition curve d) vertical curve.

v) The length of a long cord is given by the expression

a) $\frac{1}{20}$ th of the radius b) $\frac{1}{10}$ th of the radius

c) $\frac{1}{40}$ th of the radius d) $\frac{1}{50}$ th of the radius.

vi) Tilt of the staff in stadia tacheometry increases the intercept if it is

a) away from the telescope pointing down hill

b) towards the telescope pointing up hill

c) away from the telescope pointing up hill

d) none of these.

vii) If Δ is the angle of deflection of the curve, T1 and T2 are its points of tangencies, the angle between the tangent at T1 and long cord T1, T2 will be,

a) $\frac{\Delta}{4}$ b) $\frac{\Delta}{3}$

c) $\frac{\Delta}{2}$ d) Δ .

viii) A lemniscates curve between the tangents will be transitional throughout if the polar deflection angle of its apex, is

a) $\frac{\Delta}{3}$ b) $\frac{\Delta}{4}$

c) $\frac{\Delta}{5}$ d) $\frac{\Delta}{6}$.

ix) The measurement of depth below the water surface is called

a) sounding

b) the shore line survey

c) site gauges

d) the vertical control in water.

x) The water level does not remain constant in the sea due to

a) flow of water

b) ocean restless

c) tidal effects

d) variations in water levels.

xi) If the degree of a curve is 1°, then radius of the curve is equal to

a) 5400 m b) 1720 m

c) $\frac{1720}{\pi}$ m d) $\frac{3440}{\pi}$ m .

xii) The shape of the vertical curve generally provided is

a) circular b) parabolic

c) spiral d) elliptical.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. The following angles were measured in running a close traverse ABCDE in a clock wise direction :

Station	***Included angle (exterior)***
A	291° 33′
B	225° 13′
C	211° 36′
D	300° 26′
E	231° 12′

Compute the bearings of the remaining sides of the traverse, given that the observed bearing of *AB* was 10° 12′. Checks the arithmetical works of the traverse.

3. The interior angles of a closed traverse *ABCDEF* are as follows :

   A = 60° 40′, *B* = 201° 38′, *C* = 93° 19′, *D* = 69° 48′, *E* = 210° 13′ and *F* = 84° 22′. What are the deflection angles of the traverse ? Check the algebraic sum of the deflection angle of the closed traverse.

4. a) The line *AB* is 108 m and reduced bearing N 86° 42′. Calculate consecutive co-ordinate or latitude and departure of the line *AB* ? 2

   b) find out the independent co-ordinates or total co-ordinates of the traverse stations as sown below ? 3

Lime	**Latitude in *m***	**Departure in *m***
AB	+ 196·32	+ 123·63
BC	– 111·02	+ 97·88
CD	– 385·54	– 158·90
DE	+ 139·36	– 329·39

5. How can you measure horizontal angle by the method of reiteration using a theodolite ?

6. Derive an expression for the reduced level of the staff station when the line of sight is inclined downwards with the staff held vertically using the fixed hair method of tacheometry.

7. Explain transit rule in connection to error distribution in a traverse.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) Two parallel lines 180 m apart are to be joined by a reverse curve with a deflection angle of 30° 05′. If the radius of the first arc is 395 m and the chainage of the starting point of the curve 1550 m, calculate the radius of the second arc, the chainage of the point of reverse curvature and the finishing point of the reverse curve.

   b) Two tangents intersect at a chainage of 1300 m the deflection being 25°. Calculate the following quantities for setting out a curve of radius 280 m.

   i) Tangent length

   ii) Length of the curve

   iii) Chainage of point of commencement and tangency

   iv) Apex distance and

   v) Versed sine of the curve. 10 + 5

10. a) What do you mean by 'Degree of a curve' ? Derive its relationship with the radius of curve. 2 + 3

   b) Two tangents *AB* and *BC* intersect at *B*. Another line *DE* intersects *AB* & *BC* at *D* and *E* respectively such that $< ADE = 150°$ and $< DEC = 140°$. The radius of the first curve is 200 m and that of the second curve is 300 m. The chainage of *B* is 950 m. Calculate all data necessary for setting out the compound curve. Also present the setting out table. 10

11. a) The distance from two points on a photographic point to the principal line are 68·24 mm to the left and 58·48 mm to the right. The angle between the points measured with a transit is 44° 30′. Determine the focal length of the lens ? 5

b) What is terrestrial photogrammetry and aerial photogrammetry ? 2

c) Photographs of a certain area were taken from *P* and *Q* two camera stations, 100 m apart. The focal length of the camera is 150 m. The axis of the camera makes an angle of 60° and 40° with the base line at stations *P* and *Q* respectively. The image of a point *A* appears 20·2 mm to the right and 16·4 mm above the hair lines on the photograph taken at *P* and 35·2 mm to the left on the photograph taken at *Q*.

Calculate the distance *PA* and *QA* and elevation of point *A* if the elevation of the instrument axis as *P* is 126·845 m. 8

12. a) Define Relief Displacement on a Vertical Photograph. Derive the expression of Relief Displacement on a Vertical photograph with neat sketch.

b) A vertical photograph was taken at an altitude of 1300 metres above mean sea level. Determine the scale of the photograph for terrain lying at elevations of 90 metres and 350 metres if the focal length of the camera is 18 cm. 10 + 5

13. Write short notes on any *three* of the following : $3 \times 5 = 15$

a) What do you understand by remote sensing ?

b) Differentiate between active a passive remote sensing ?

c) Application of remote sensing in civil engineering ?

d) i) Sensors

ii) Electromagnetic energy and

iii) Indian remote Sensing Satellites (IRS).

e) Transit rule of adjusting a closed traverse for balancing error corrections.