* R M - 6 4 4 1 / 2 0 0 *

RM-6441

B. E. II (Sem. IV) (Civil) Examination

April / May – 2010

Surveying - II

Time : Hours] [Total Marks : **100**

Instruction :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 2 (Sem. 4)**

Name of the Subject :

☛ **Surveying - 2**

☛Subject Code No. : **6 4 4 1** ☛Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Answer to the **two** sections must be written in **two separate** answer books.
(3) Assume suitable data if required and mention it clearly.
(4) Draw neat and labelled sketch wherever required.
(5) Use of non programmable calculator is permitted.
(6) Figures to the **right** indicate full marks.
(7) Answer should be rounded off to two decimal places.

SECTION - I

1 (a) (i) In Beaman -Stadia arc, if the V-Scale reading is 45, it indicates_____(depression, elevation) **10**

(ii) A remorte sensing system that does not use natural source of energy is called as_____

(iii) For a celestral body in Astronomy, _____ is a function of time. (Altitude, Hour Angle, Azimuth).

(iv) In Fergusson's percentage unit system, the circle is divided into_____parts (2,4,8)

(v) _____(Emission, Reflection, Absorption) is not an example of surface phenomena.

(vi) A subtense bar can be used to determine distance upto_____m.

(vii) _____is the result, when the effect of wind is not considered during flight planning (mosaic, drift, crab)

(viii) A star which does not set and is therefore above the horizon is known as_____
(elongated star, circumpolar star, polari)

(ix) cm = m _____ is an appropriate scale of an air photograph (1cm= 10m, 1cm=100 m, 1 cm= 1000m)

(x) The number of natural satellite the earth has is _____(1,4,12,24)

(b) Write short notes on any **three** of the following. **9**

(i) Fiducial or Collimatron marks.

(ii) Stereoscope

(iii) Astronomical Corrections

(iv) Accuracy of tacheometric obseravations

(v) Electromagnetic Spectrum.

2 (a) Derive tacheometric distance equation D= KS+C. with a sketch. **6**

(b) A levelling staff is held vertical at a distance of 100 m and 300 m fromt he axis of a tacheometer and the staff intercept for horizontal sights are 0.99 m and 3.00 m respectively. Find the constants of the instrument. **5**

This instrument is set up at the station A and the staff is held vertical at a point B. With the telescope inclined at an angle of depression of 15^{o} to the horizontal, the readings on the staff are 2.981 m, 1.9805 m, 0.98m. Calculate the R.L. of B and its horizontal distance from A. The H.I. is 1.65 m and RL is 415 m.

OR

(b) Discuss the difference between 'Altitude and Azimuth system" (horizon system) and Right Ascunsion and Declination System (Equatorial system). **5**

(c) Explain vertical base subtense method with a neat sketch. Write the distance equation for the subtense method for a horizontal line of right, considering the index error. **5**

3 (a) What are different displacements and errors in aerial photogrammetry? **5**

(b) A 3650 m long line lying at an elevation of 700 m measures 13.5 cm on a vertical photograph. The focal length of the camera used is 25 cm. Determine the scale of the photograph for an area having an elevation of 1400 m. **5**

OR

(b) Explain the effect of atmosphere on Electromagnetic Radiations. **5**

(c) Compute number of strips and number of photographs required to cover an area 10 km wide and 18 km long. The Airplane has a speed of 175 km /h. A camera with a focal length of 27 cm is to be used. The approximate scale is 1:20,000, the average elevation of the ground is 373 m and the photographs are to be 25 cm and 25 cm. The forwar lap is 70% and the side lap is 30%. **5**

SECTION - II

4 (a) True or False : **6**

(i) Colby apparatus is flexible type of apparatus for measuring bases.

(ii) Tellurometer is most commonly used for third order triangulation.

(iii) Figure adjustment in triangulation is best achieved by the method of least squares.

(iv) The value of spherical excess is 1 " for an area of about 196 km^2 .

(v) In the triangulation adjustment for closing the horizon condition, the error is distributed inversely as the respective weights.

(vi) Method of least squares is known as a rigid method of figure adjustment.

(b) Do as Directed. **4**

(i) The radius of a circle is 10 m with a probable error of ± 0.2 The probable erroor of its circumference is _____(Fill in the blank)

(ii) Tick and write answer. The graphical elements of vector data structures are

(i) Point
(ii) Arc
(iii) Area
(iv) All of these

(iii) If the reduced distance at m-s-l be, k what will be the spheroidal distance S for E.D.M. ?

(iv) Choose and write the right answer in a raster overlay, a point is represented by

(a) String of cells
(b) Group of cells
(c) Single cell
(d) All of these

(c) Write any **three** in brief : **9**

(i) Name the types of data as input in GIS.

(ii) Enlist modern surveying instruments.

(iii) Write the points for site selection of base line.

(iv) State the rules of distribution of error to the field measurement.

5 (a) Find out the corrected values of angles, P, Q and R neglect spherical excess. **15**

$\angle P = 48^{o}\ 18'\ 22''$ weight = 3

$\angle Q = 76^{o}\ 32'\ 47.2''$ weight = 1

$\angle R = 55^{o}\ 08'\ 53.8''$ weight = 3

(b) Discuss about various types of error for triangulation adjustment.

OR

(b) Discuss about key components of GIS.

(c) Included angles at a station is $125^{o}\ 30'\ 20''$ with weight 2. The external angle at the same station is $234^{o}\ 28'\ 40''$ with weight 4. Find the most probable values.

6 (a) Discuss the problems in base measurement. **16**

(b) What is satellite station? Why it is required ? How are the observed angles to and from a satellite station reduced to their true value?

OR

(b) Discuss about E.D.M. corrections.

(c) (i) In a triangle ABC, angles A, B and C were observed as 70°, 50° and 60^{o} . The line AC was used as a base of known length. Calcualte strength of the figure.

(ii) Observations were made on a center of a 10 cm diameter signal, from the measurement at A.The distancce AB is 6 km and the sun makes an angle of 50^{o} with line AB. Determine the phase error if the observation are made on the bright portion.