

B.TECH. SEM -V (CIVIL) 2014 COURSE (CBCS) : WINTER - 2017

SUBJECT: ADVANCED SURVEYING

Day: **Saturday**
Date: **13/01/2018**

Time: **02.30 PM TO 05.30 PM**
Max. Marks: 60

W-2017-2122

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labelled diagrams wherever necessary.
- 4) Assume suitable data if necessary.
- 5) Use of electronic non programmable calculator is **ALLOWED**.

Q.1 a) Explain with a neat sketch various triangulation figures and their suitability. [04]

b) Determine most probable values of angles of triangle ABC from following observations. Use method of normal equations [06]

$$\begin{aligned}\angle A &= 58^{\circ} 24' 43'' \text{ ----- wt 1} \\ \angle B &= 50^{\circ} 12' 32'' \text{ ----- wt 2} \\ \angle C &= 71^{\circ} 22' 35'' \text{ ----- wt 3}\end{aligned}$$

OR

a) State and derive principle of least square. [05]

b) Determine most probable values of the angles closing the horizon at a station, from the following observations. [05]

$$\begin{aligned}\angle A = 45^{\circ} 23' 34'' \text{ --- wt1} & \quad \angle B = 75^{\circ} 37' 17'' \text{ ----- wt 2} \\ \angle C = 125^{\circ} 21' 18'' \text{ -- wt 3} & \quad \angle D = 113^{\circ} 37' 52'' \text{ ----- wt 4.}\end{aligned}$$

Q.2 a) Describe types of total stations as per EDM, range and angle resolution system. [05]

b) State various types of errors in Electronic total station survey. [05]

OR

a) State and describe temporary adjustments of Electronic total station. [04]

b) Explain following terms with respect to total station survey. [06]

- i) REM ii) RDM iii) Free stationing

Q.3 a) Define SBPS and explain with sketch segments of SBPS. [05]

b) Comment in brief on co-ordinates and heights determined with a SBPS. [05]

OR

a) Bring out difference between GNSS and RNSS types of SBPS and list down GNSS and RNSS types SBPS in action. [05]

b) What is mean by access denial in SBPS, list down techniques of access denial and describe the technique of access denial currently in use. [05]

P.T.O.

Q.4 a) What is sounding? Explain use of Eco sounder for deep ocean sounding. [05]

b) Explain any two methods of locating sounding by shore observations. [05]

OR

a) Describe the process of establishing horizontal and vertical controls in Hydrographic survey. [05]

b) What is three point problem in Hydrographic survey? Explain analytical solution of three point problem. [05]

Q.5 a) What is relief displacement in aerial photograph? Derive expression for relief displacement. [04]

b) An area measuring 25 km X 15 km is to be surveyed using aerial photogrammetry. The focal length of camera lens used is 15 cm. the size of photograph is 23 cm X 23 cm. the average scale of photo required is 1:15 000 at an average elevation of 300 m above datum. The longitudinal and side laps are 60% and 30% respectively. Air craft speed is 225 km/ hr determine

i) flying height

ii) Spacing of flight lines

iii) total no. of photographs required iv) exposure interval

OR

a) Explain principle, working and use of parallax bar in photogrammetry. [04]

b) Determine the Reduced levels of the points A & B from the following data. [06]

R.L of point C = 252m

RL of point D = 316m

Parallax reading of point C = 8.54 mm

Parallax reading of point D = 10.14 mm

Parallax reading of point A = 12.56 mm

Parallax reading of point B = 9.32 mm

Assume average photo base = 82 mm

Q.6 a) Define remote sensing, state difference between active and passive systems of remote sensing and list down components of a remote sensing system. [05]

b) Define GIS, list down components of GIS and discuss in brief hardware as one of the component of GIS. [05]

OR

a) State why electromagnetic radiations are preferred to exchange information between ground objects and sensors. State and explain the equation used to characterize the electromagnetic radiations. [05]

b) Enlist any five limitation and any five civil engineering applications of remote sensing. [05]

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