Time: 3 hours Marks: 80

N.B. : (1) Question **No 1** is **compulsory**.

(2) Attempt any **THREE** questions from the remaining questions.

(3) Assumptions made should me clearly stated.

(4) **Figures** to the **right** indicate **full marks**

Q1. Attempt any **FIVE** questions 20

a) Draw a simple circular curve and explain all the elements of the same.
b) What are the objectives of hydrographic surveying?
c) Define Exposure station, Nadir point, Flying height and Swing.
d) What are the objectives of GIS?
e) Distinguish between conventional theodolite and electronic theodolite.
f) Two straights intersect at chainage of 2056.44m and angle of intersection is 120˚. If the radius of simple curve is 600m calculate tangent distance and chainage at point of commencement.

Q2. (a) The centre line of a road is to be tangential to each of the following lines. Calculate the radius of curve and tangent lengths 10

Line	WCB	Length
AB	0˚	.....
BC	90˚	450.24m
CD	143˚12’	.....

Q2. (b) What is electronic digital theodolite? Mention its field application of it. 10

Q3. (a) What do you mean by setting out work? Explain setting out work for a building 10

Q3. (b) Distinguish between land survey and construction survey 5

Q3. (c) A straight length of a highway AB appears to be 12.5cm on a vertical air photograph of 15cm focal length. The corresponding distance of the highway on 1:50000 topographical maps are 6.25cm. Assuming the average elevation of the terrain as 1250m above MSL. Calculate the flying height of the camera above the MSL. 5

Q4. (a) How the details generated to plot ‘L’ section and ‘C’ section in survey camp? What is the utility of the section for an engineer? 10

Q4.(b) In a road alignment a grade of -1.0% is followed one of +0.5%. The chainage and RL of intersection point are 400m and 250.50m respectively. The rate of change of gradient is 0.1% per 20m. Calculate the necessary data for setting out the vertical curve take peg interval of 30m. 10

Q5.(a) Describe various obstacle in laying out of simple curve with neat sketch 10

Q5.(b) What is GPS ? Give the principle, types of GPS and application of GPS in civil engineering field. 10

Q6. Attempt any **FOUR** 20

a) Distinguish between composite curve and compound curve.
b) Explain 7/12 utara.
c) Principle and use of aerial photogrammetry.
d) Define remote sensing system and necessity of the same.
e) Field application of Total station.

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