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BTECH
(SEM III) THEORY EXAMINATION 2024-25
SURVEYING AND GEOMATICS

TIME: 3 HRS**M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A**1. Attempt all questions in brief.****2 x 07 = 14**

Q no.	Question	CO	Level
a.	Define profile leveling and cross-sectioning.	1	K1
b.	What are the different types of transition curves?	2	K1
c.	What are the types of EDM instruments?	3	K1
d.	What is the difference between aerial and terrestrial photogrammetry?	4	K1
e.	What is photogrammetry?	4	K1
f.	What is accuracy assessment in digital image analysis?	5	K1
g.	Write the different types of errors that can occur in image classification.	5	K1

SECTION B**2. Attempt any three of the following:****7 x 3 = 21**

a.	A steel tape of 20 m length is used at a temperature of 40°C. If the standard temperature is 25°C and the coefficient of thermal expansion is 0.000012/°C, calculate the temperature correction.	1	K3
b.	Compare the advantages and disadvantages of various transition curve types.	2	K2
c.	Discuss the applications of GIS in civil engineering in infrastructure planning, environmental monitoring.	3	K3
d.	Draw a diagram to illustrate the concept of relief displacement on an aerial photograph.	4	K3
e.	Explain the use of LIDAR in topographic mapping and infrastructure monitoring.	5	K3

SECTION C**3. Attempt any one part of the following:****07 x 1 = 07**

a.	Calculate the area of a field using the trapezoidal rule given the following offsets: 5 m, 10 m, 15 m, 12 m, and 8 m at intervals of 10 m.	1	K2
b.	Explain the methods of contouring. What are the uses of contour maps?	1	K2

4. Attempt any one part of the following:**07 x 1 = 07**

a.	Derive the formula for the length of a transition curve using the rate of change of acceleration approach.	2	K4
b.	Determine the tangent length, curve length, and long chord for a curve with a radius of 300 m and deflection angle of 45°.	2	K3

5. Attempt any one part of the following:**07 x 1 = 07**

a.	Sketch the data models used in GIS (e.g., raster, vector) and explain their advantages and disadvantages.	3	K3
b.	Explain the concept of surveying using a total station and reflector less EDM. Discuss its advantages and limitations.	3	K3



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6. Attempt any one part of the following: 07 x 1 = 07

a.	An aerial photograph is taken from a flying height of 1500 m using a camera with a focal length of 200 mm. The photograph shows a building with a height of 50 m. If the relief displacement of the building on the photograph is 0.8 cm, calculate (i) The scale of the photograph. (ii) The height of the building using the relief displacement method.	4	K3
b.	Explain the concept of digital photogrammetry. Discuss its advantages over traditional photogrammetry.	4	K3

7. Attempt any one part of the following: 07 x 1 = 07

a.	Describe the applications of LIDAR in civil engineering for topographic mapping, infrastructure monitoring.	5	K3
b.	Discuss the importance of atmospheric windows in remote sensing and explain how they are used.	5	K3