Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 08

PHD (CIVIL)

CIVIL ENGINEERING APPLICATIONS OF REMOTE SENSING AND GIS

Time : 3 Hrs. Max. Marks : 100

INSTRUCTIONS TO CANDIDATES :

1. **Attempt any FIVE questions out of EIGHT question.**
2. **Each question carry TWENTY marks.**

1. (a) From basic principles, derive the expression for the scale of a vertical photograph over flat terrain. (8)

   (b) A vertical aerial photograph was taken with a 15.24 mm local length camera from a flying height of 1350m above the datum. Images *a* and *b* of two ground points A and B appear on the photograph, and their measured photo coordinates corrected for shrinkage and distortions) are $x_a = -52.35$ mm, $y_a = -48.27$ mm, $x_b = 40.64$ mm and $y_b = 43.88$ mm. Determine the horizontal length of the line AB if the elevations of points A and B are 200 and 145 m above datum respectively. (6)

   (c) Discus some of the uses of terrestrial or close range photogrammetry. (6)

2. (a) Define dip angle. Derive the expression for calculating dip angle for high oblique photographs. (8)

   (b) Write a short note on "Digital Photogrammetry". (12)

3. (a) Discuss push-broom scanning technique adopted for IRS satellites. (10)

   (b) Write in brief about Remote sensing observation platforms. (10)

4. (a) What do you mean by Image Parallax? Show the parallax difference : (12)

$$\Delta p = (\Delta h / H')_{Pa}$$

where Δh = elevation difference between two points

H' = flying height above the lower point

Pa = Parallax of the higher point

   (b) What are the different elements of image interpretation and digital image processing. (8)

5. (a) Discuss briefly. Some of the applications of remote sensing. (10)

   (b) Why is the aerial photographer concerned about scattered energy? What steps can he take to circumvent the problems caused by scattered energy? (10)

6. (a) As an engineer, how you will assess water penetration properties using remote sensing/GIS. (8)

   (b) Differentiate between : (12)

   (i) Precise positioning service and standard positioning service.

   (ii) Vector and Raster data.

7. (a) Why is map preparation important to GIS data input? What are registration point? (8)

   (b) What are DEM's? What is the relationship between discrete altitude matrix and a TIN model? (12)

8. Write a short not on **any two :**

   (a) Re-modelling of water distribution systems using GIS. (10)

   (b) Urban Development Planning using RS and GIS. (10)

   (c) Environmental Solid Waste and Degradation Assessment using RS and GIS. (10)