

## BACHELOR OF ENGINEERING (CIVIL ENGINEERING) SECOND YEAR FIRST SEMESTER – 2019

Subject: SURVEYING- III

Time: Three Hours

Full Marks: 100(50 for Part-I)

## Part: Part-I

Use a separate answer script for each Part

## Group-A (Answer any one)

1. Write short notes on-
  - a. Major divisions of electromagnetic spectrum (6)
  - b. Scattering (6)
  - c. Atmospheric Windows (6)
2. a) A tower of height 120m has an image of height 3.2cm in photograph. Calculate distance of tower from camera if  $f=152.4\text{mm}$ . (6)
- b) A vertical photograph was taken from a height of 1600 above MSL. Determine the scale of photograph for an area at average elevation of 250m above MSL. Focal length of camera ( $f$ ) is 15 cm. (6)
- c) A tower appears in two successive photographs taken at an altitude of 4000m above datum. The focal length of the camera is 160mm. The length of the air base is 300m. The parallax for the top and bottom of the pole are 72 mm and 63 mm respectively. What is the height of top of the tower above its bottom? (6)

## Group-B(Answer any two)

3. a) What are the main components of aerial camera? Describe. (10)
- b) Vertical photograph of size 30cm×20cm were taken to cover a total area on ground of 32000 Sq. KM. If scale of vertical photograph is 1cm=400m then calculate the number of photographs required. If the longitudinal lap is 40% and side lap is 30%. (6)
4. a) Briefly describe geometry of vertical aerial photograph (10)
- b) A section line AB 300m long on a flat terrain measure 102.4 mm on the vertical photograph. A radio tower also appears on the photograph. The distance measured from the principal points to the image of the bottom and top of the radio tower to be 7 cm and 8 cm respectively. The average elevation of the terrain was 553m. Determine the height of tower. Take  $f=152.4\text{mm}$ . (6)
5. a) Describe the elements of image interpretation. (10)
- b) Write short on working principles of EDM. (6)

**BACHELOR OF ENGINEERING (CIVIL ENGINEERING) EXAMINATION 2019**  
(Second Year, First Semester)

**SURVEYING III**

Time: Three Hours

Full Marks 100  
(50 marks for each part)

Use a separate Answer-Script for each part

Question No.	Part - II (50 Marks)	Marks
Answer any <b>TWO</b> questions out of three from this Part		
1	(a) Define 'Remote Sensing' and 'Satellite Remote Sensing'.	2+2=4
	(b) Discuss on 'Electromagnetic Spectrum' with a neat sketch.	9
	(c) Explain briefly about the different types of 'Energy Interactions in the Atmosphere'	9
	(d) Define 'Spectral Reflectance' and express its quantification.	3
2	(a) What are the basic information we can have from FCC?	5
	(b) What is called reference data in remote sensing? Give example of two reference data and explain which one of them is preferable and why?	1+4=5
	(c) How can you identify (visually) oxbow lake in FCC?	2
	(d) How do you identify the cropping pattern of any agricultural land through a time series satellite data?	5
	(e) How do you identify the natural and artificial features through satellite imageries?	3
	(f) Indicate the reflectance value (typically: High, Medium or Low) as high, medium or low for the following features: (i) Shallow water; (ii) Shallow water with suspended sediment; (iii) Deep water; (iv) Polluted Water; (v) Dry sand; (vi) New concrete roof; (vii) Mud flat; (viii) Wet sand; (ix) Dense forest with larger leaves tree; (x) Flowing water.	5
3	(a) What are the different steps of digital image processing? What are the utilities of these steps? Also explain about 'Band Ratio'	3+4+2=9
	(b) What is 'Ground Truth Verification (GTV)? Why it is essential for remote sensing?	2+2=4
	(c) Draw a '7x7' pixel matrix for geo-coded pixel positions superimposed on original positions.	4
	(d) How do you identify the river meandering dynamics from a time series satellite data?	4
	(e) Define 'Ground Control Points (GCP)' and 'Training Stage' with brief discussion about their function.	4