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**INSTITUTE OF AERONAUTICAL ENGINEERING****(Autonomous)**

Dundigal, Hyderabad - 500 043

B.Tech III SEMESTER END EXAMINATIONS (REGULAR / SUPPLEMENTARY) - FEBRUARY 2023**Regulation: UG20****SURVEYING AND GEOMATICS****Time: 3 Hours****(CIVIL ENGINEERING)****Max Marks: 70****Answer ALL questions in Module I and II****Answer ONE out of two questions in Modules III, IV and V****All Questions Carry Equal Marks****All parts of the question must be answered in one place only****MODULE – I**

1. (a) Describe the 'Height of Instrument' and 'Rise and Fall' methods of computing the levels. Discuss the merits and demerits of each. [BL: Understand| CO: 1|Marks: 7]
- (b) The following perpendicular offsets were taken at 10 meters intervals from a survey line to an irregular boundary line:
3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65 m.
Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offsets, by the application of i) Average ordinate rule ii) trapezoidal rule
[BL: Apply| CO: 1|Marks: 7]

MODULE – II

2. (a) Explain how you would take field observations with a theodolite so as to eliminate the following verniers.
i) Error due to imperfect adjustment of plate levels
ii) Error due to line of collimation not being perpendicular to the horizontal axis.
[BL: Understand| CO: 2|Marks: 7]
- (b) The vertical angles to vanes fixed at 1 m and 3 m above the foot of the staff held vertically at a station A were +20° 30' and +50° 48' respectively. Find the horizontal distance and the reduced level of A if the height of the instrument, determined from observation on to a bench mark is 438.556 meters above datum.
[BL: Apply| CO: 2|Marks: 7]

MODULE – III

3. (a) List the properties of electromagnetic waves. Discuss the three basic segments consists in Global Positioning System. [BL: Understand| CO: 3|Marks: 7]
- (b) Discuss principle of electronic distance measurement (EDM). Classify various EDM instruments depending upon the type of carrier wave employed. [BL: Apply| CO: 3|Marks: 7]
4. (a) How will you measure the horizontal angle and vertical angle by using total station? Discuss about remote elevation and remote distance method in total station.
[BL: Understand| CO: 4|Marks: 7]

- (b) What is modulation? Discuss the necessity of modulation and explain AM and FM modulation. [BL: Apply| CO: 4|Marks: 7]

MODULE – IV

5. (a) Explain how the ground control is essential for establishing the position and orientation of each photograph in space relative to the ground. [BL: Understand| CO: 5|Marks: 7]
(b) A vertical photograph was taken at an altitude of 1200 meters above mean sea level. Determine the scale of the photograph for terrain lying at elevations of 80 meters and 300 meters if the focal length of the camera is 15cm. [BL: Apply| CO: 5|Marks: 7]
6. (a) How the terrestrial photogrammetry are divided into two branches? List the factors effecting in aerial photographs and mention the preventive measures to minimize them in Photogrammetric surveying. [BL: Understand| CO: 5|Marks: 7]
(b) The scale of an aerial photography is 1 cm = 100 m. The photograph size is 20cm x 20cm. Determine the number of photographs required to cover an area 10 km x 10 km, if the longitudinal lap is 60% and the side lap is 30%. [BL: Apply| CO: 5|Marks: 7]

MODULE – V

7. (a) Describe in detail about idealized remote sensing system with a neat sketch. Write about remote sensing observation platforms. [BL: Understand| CO: 6|Marks: 7]
(b) Discuss the interaction of electromagnetic radiation with the atmosphere using various scattering mechanism. [BL: Apply| CO: 6|Marks: 7]
8. (a) List various types of sensors used for remote sensing in India. Write a detailed note on NOAA Satellite and discuss the particulars of NOAA Satellites. [BL: Understand| CO: 6|Marks: 7]
(b) Discuss the terms spectral reflectance, specular reflection and diffuse reflection. Outline spectral properties of water bodies and how these can be used to differentiate pure and sediment water. [BL: Apply| CO: 6|Marks: 7]

