KATHMANDU UNIVERSITY
End Semester Examination [C]
May/June 2019

Marks Scored:

Label : B.E.
Year : III
Course : GEOM 316
Semester: I

Exam Roll No. :
Time: 30 mins.
F. M. : 10

Registration No.:
Date 30 MAY 2019

SECTION "A"
[20 Q × 0.5 = 10 marks]

Choose the most appropriate answer among the given options. The symbols have usual meaning.

1. What is the fundamental principle of photogrammetry?
   a. Interference
   b. Resection principle
   c. Triangulation
   d. Intersection principle

2. Which of the following option is true for given statements about photogrammetry?
   Statement 1: Both aerial and terrestrial photogrammetry used in Urban planning.
   Statement 2: Terrestrial photogrammetry is more suitable for movement related issues.
   a. T, T
   b. F, F
   c. F, T
   d. T, F

3. Which instrument lets an operator see two photos at once?
   a. Goniometer
   b. Collimator
   c. Theodolite
   d. Stereo plotter

4. The coverage is least if photography is _____.
   a. High oblique
   b. Low oblique
   c. Vertical
   d. Tilted

5. The relief displacement of a tower 72 m high on photograph is 7.2 mm and its top appear 10 cm away from principal point. The flying height of the camera, is _____.
   a. 500 m
   b. 1000 m
   c. 1500 m
   d. 2000 m

6. Perspective center relates to _____.
   a. central projection
   b. orthogonal projection
   c. parallel projection
   d. cylindrical map projection

7. An aerial photographer is frequently exposed to _____.
   a. Rain
   b. Snow
   c. Heat
   d. Wind

8. _____ of a camera lens is the line passing through the optical center, and front and rear nodal points.
   a. Camera axis
   b. Principal line
   c. Plumb line
   d. Optical axis

9. Scale varies due to relief displacement and tilt displacement in _____.
   a. Aerial photograph
   b. Orthophoto
   c. True orthophoto
   d. Topographic map

10. How is obscured area related?
    a. Directly proportional to relief displacement
    b. Directly proportional to focal length
    c. Inversely proportional to relief displacement
    d. Inversely promotional to flying height

11. Which of the following is correct order of occurrence of Coordinate System in Photogrammtric process?
    a. Map, camera, image, terrain
    b. Map, image, camera, terrain
    c. Terrain, camera, image, map
    d. Terrain, image, camera, map

12. A camera with focal length of 610mm would be classified as _____.
    a. Narrow angle
    b. Normal angle
    c. Wide angle
    d. Super wide angle

13. What memory size would be sufficient to capture 500 images of 4096 × 2160 with 8 bits per color space?
    a. 4 GB
    b. 8 GB
    c. 16 GB
    d. 32 GB

14. Which of the following is the definition of 'parallax'?
    a. The area on the ground covered by the remote sensing instrument
    b. A mathematical method for fitting a model to data so as to minimize error between the observed values and the estimated values
    c. The apparent change in position of an object when viewed from two different positions
    d. The fading, disturbance or degradation of a signal from surface reflectance caused by signals from unwanted sources

15. How large is the typical aperture on a pinhole camera?
    a. 1 inch
    b. 1 cm
    c. 0.5 cm
    d. 0.5 mm

16. _____ is optimal choice of software for naïve processing of Terrestrial images.
    a. 123D Catch
    b. Visual SFM
    c. PhotoScan
    d. Pix4Ddesktop

17. Differential rectification is use to correct for _____.
    a. Tip
    b. Tilt
    c. Swing
    d. Terrain relief

18. Error due to _____ must be corrected first.
    a. Curvature of the Earth
    b. Atmospheric refraction
    c. Lens distortion
    d. Principal point displacement

19. Absolute orientation determines ___ parameters.
    a. 5
    b. 6
    c. 7
    d. 12

20. Pick the incorrect statement.
    a. INS contains precise accelerometers to record linear and angular acceleration
    b. INS provides velocity, position and orientation information
    c. Cost of quality INS is high
    d. Drift error is independent of time

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F. M. : 40

SECTION "B"
[6 Q × 4 = 24 marks]

Attempt *ANY SIX* questions. Assume data wherever necessary. Figures in the margin indicate full marks.

1. Define Photogrammetry. Explain applications of Aerial and Terrestrial Photogrammetry. [1 + 3]

2. Describe benefits and limitations of aerial photographs. Briefly explain advantages and disadvantages of oblique imageries. [2 + 2]

3. How is height of an object obtained by measuring relief displacement? Explain with a numerical example. Assume suitable data. [4]

4. Briefly describe factors affecting geometric quality of orthophotos. [4]

5. Describe accommodation with suitable diagrams? Explain Epipolar plane and Epipolar line with necessary figure. [2 + 2]

6. How do color filters work? Explain with diagrams. What is their use in Photogrammetry? [3 + 1]

7. Write short notes on (*ANY TWO*): [2 × 2 = 4]
   i. Camera coordinate system
   ii. Ideal distribution of GCPs
   iii. Image interpretation elements
   iv. Qualitative evaluation of Block Adjustment

SECTION "C"
[2 Q × 8 = 16 marks]

Attempt *ALL* questions. Figures in the margin indicate full marks.

8. Describe benefits of incorporating GPS/INS data into Block Adjustment? Explain Absolute Orientation in detail with equations in matrix form and necessary diagram. [3 + 5]

9. How is DTM generated in Photogrammetry? Describe types of image matching techniques with their advantages and disadvantages. [3 + 5]

OR

What is Image pyramid? Why is it useful? Explain with necessary diagram. What is Terrestrial Photogrammetry? Shortly describe its requirements/guidelines for photo acquisition. [4 + 4]