Marks Scored:

KATHMANDU UNIVERSITY
End Semester Examination
March/ April, 2017

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

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

Registration No.:
Date : MAR 2 6 2017

SECTION "A"
[20 Q × 0.5 = 10 marks]

Choose the most appropriate answer among the given options.

1. Scale of an aerial photograph depends on .....
   a) Flying height of the aircraft above Geoid
   b) Flying height of the aircraft above ground object
   c) Flying height of the aircraft above Ellipsoid
   d) Flying height of the aircraft above datum

2. Which of the following is TRUE for aerial photograph?
   a) Larger the scale, smaller the object size on photograph
   b) Larger the scale, difficult to recognize the details
   c) Larger the scale, smaller the processing time
   d) Larger the scale, smaller the ground coverage

3. Which of the following is FALSE?
   a) Higher the focal length of the camera, lower is the AFOV
   b) Higher the altitude of aircraft, smaller the scale of photo
   c) Increasing the focal length of the camera, increases the ground coverage
   d) Relief displacement is outward for points with elevations above the datum

4. Which of the following system is represented in 3D?
   a) Digital image system b) Camera system c) Map system d) Ortho-photo

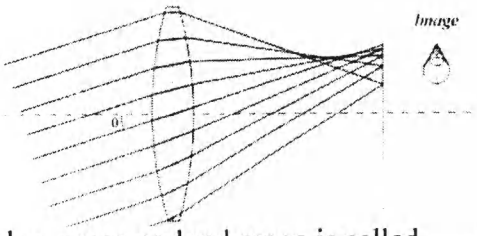
5. Which of the following filter is used to enhance contrast?
   a) NIR blocking filter b) Yellow filter c) Vignetting filter d) Blue filter

6. RMK TOP aerial camera was developed in .....
   a) 1918 b) 1922 c) 1956 d) 1989

7. How many gray levels are there to display the brightness/color of a pixel with 11 bits per pixel?
   a) 1023 b) 1024 c) 2047 d) 2048

8. When a near object is viewed, ...
   a) The eye muscles feel relaxed
   b) The eye muscles are contracted
   c) The spherical surface of eye lens becomes flatter
   d) The focal length is increased

9. The following figure depicts the .....lens detect.
   a) Coma
   b) Spherical aberration
   c) Chromatic Aberration
   d) Astigmatism



10. Emulsion sensitive to blue, green and red range is called .....
    a) Panchromatic b) Orthochromatic c) IR emulsion d) White emulsion

11. Which of the following image acquisition error is corrected first?
    a) Atmospheric Refraction
    b) Curvature of the Earth
    c) Scanner calibration
    d) Lens distortion

12. If 4 fiducial marks are measured on an analog image, ... transformation should be used.
    a) Similarity
    b) Affine
    c) Projective
    d) General polynomial

13. In Resection, a minimum of ..... control points are required for unique solution.
    a) 1 b) 2 c) 3 d) 4

14. Which of the following parameter is NOT determined during Absolute Orientation?
    a) Translationsalong X, Y, Z
    b) Rotations with respect to X-, Y- and Z-axes
    c) Scale factors in X, Y and Z direction
    d) A uniform scale factor

15. Which of the following is FALSE for Polynomial Strip Adjustment?
    a) Computationally expensive
    b) Accuracy is low
    c) Gross effects can be corrected
    d) Systematic errors accumulate

16. Which of the following statement is FALSE?
    a) INS smooths out random errors
    b) INS provides discrete positioning
    c) INS serves as backup system in case GPS signal is lost
    d) INS provides orientation data together with position

17. Which of the following is TRUE for Terrestrial Photogrammetry?
    a) It uses iterative solution
    b) It is highly accurate
    c) It is generally automated
    d) It uses metric camera

18. ..... technique has High degree of workflow automation as well as results High accuracy DTM .
    a) Map digitizing
    b) Field Surveying
    c) Photogrammetric stereo digitizing
    d) Photogrammetric image matching

19. In Ortho-photo preparation, differential rectification is used to correct for.....
    a) Relief displacement
    b) Tilt
    c) Tip
    d) Optical distortion

20. Beacon is an example of .....
    a) Natural points
    b) Signalized points
    c) Artificially marked points
    d) Post pointing GCP

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SECTION "B"
[6 Q × 4 = 24 marks]

Attempt *ANY SIX* questions. Each question carry equal marks.

1. What is Relief displacement? Derive the necessary formula for estimating height of an object from Relief displacement.

2. Describe type of image coordinate system with necessary diagrams.

3. What is Pinhole camera? Explain spectral sensitivity of emulsion.

4. Briefly discuss the things you should avoid in Terrestrial image acquisition.

5. Illustrate area based image matching algorithm.

6. Shortly describe image interpretation elements.

7. How do you check whether a photograph is true orthophoto? Compare aerial image with orthophoto.

8. Explain the following terms used in Photogrammetry:
   a) Principal plane
   b) End lap and side lap

SECTION "C"
[2 Q ×8 = 16 marks]

Attempt *ANY TWO* questions. Each question carries equal marks.

9. What are the different constraints that may be applied for faster and efficient image matching. Explain them in detail with supporting figures.

10. Describe ideal distribution of tie points and GCP in a block. For a photograph with exterior orientation elements (ω, Φ, κ) = (3, -4, 10) degrees and (X_L, Y_L, Z_L) = (15000, 10000, 3000) meters and camera parameters (x_0, y_0, f) = (-0.015, -0.007, 153.0) mm, compute via the collinearity equations the coordinates of the ground point (X, Y, Z) = (14500, 9700, 300) meter in the fiducial based image coordinate system.

11. Describe Relative Orientation. Integration of onboard GPS data into block adjustment requires careful attention. Justify this statement.