

**UNIVERSITY OF PETROLEUM  
AND ENERGY STUDIES**



**End Semester Examination –May, 2018**

**Program/course: B.TECH/ GSE**  
**Subject: Photogrammetry and Remote Sensing**  
**Code : GSEG 212**  
**No. of page/s: 03**

**Semester – IV**  
**Max. Marks : 100**  
**Duration : 3 Hrs**

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**All questions are compulsory.**

**SECTION –A [20 marks]**

Ques 1. a) How do you distinguish between photogrammetry and remote sensing? **4 marks**

b) What is the basic principle of photogrammetry? Illustrate the concept with a simple diagram.

**3 marks**

c) What are the parameters of inner orientation of camera? **3 marks**

Ques2. a) Explain briefly the following terms of Image Enhancement [2 x 3 = 6 marks]

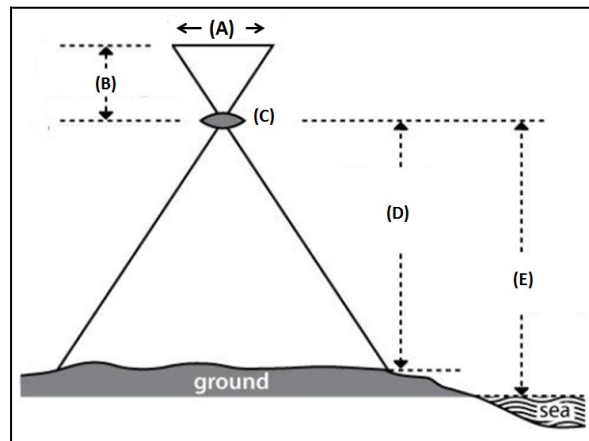
- i) Point Operations
- ii) Local Operations
- iii) Image Transformation

b) How do you differentiate between a DEM and a DSM? Give one practical use of each. **4 marks**

**SECTION –B [10 X 4 = 40 marks]**

Ques 3. a) An aerial camera has a focal length of 35 mm; the altitude of the plane is 800m above sea level, the average ground elevation above sea level is 100m, express the scale of the photograph as a representative fraction? **5 marks**

b) Label all the parts in the following figure. **5 marks**



Ques4. a) An aircraft was flying at an altitude of 25000 feet above the ground and takes a vertical aerial photograph of an object which is 30 meters in height. The image of the object is at a distance of 6 inches from the nadir point. Calculate the relief displacement? **5 marks**

b) . Explain the term Band Rationing? Describe its importance as an image transformation technique with a suitable example? **5 marks**

Ques5. Explain the following image processing techniques. **[5 X 2 = 10 marks]**

- i) Edge Enhancement
- ii) Principal component analysis

Ques6. Describe spatial interpolation and intensity interpolation methods to geometrically rectify a remotely sensed image? **10 marks**

**SECTION –C [20 X 2 = 40 marks]**

Ques7. a) Show, with the aid of a diagram and relevant calculations, how histogram equalization changes the distribution of pixel values in a histogram. You may choose any arbitrary values for frequencies limited to just 8 grey values. **10 marks**

b) Describe the various types of aerial photographs along with their characteristics? **10 marks**

Ques8. a) What is spatial filtering? Describe the image convolution process with suitable diagrams?

**10 marks**

b) Differentiate between supervised and unsupervised classification and summarize the steps involved in both types of classifications using a flow diagram? **10 marks**