UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

UPES
THE NATION BUILDERS UNIVERSITY

End Semester Examination – December 2017

Program/course: M.Tech PLE   Semester – I
Subject: GIS Image Processing for Petroleum Industry   Max. Marks   : 100
Code   : MPTI 804   Duration   : 3 Hrs
No. of page/s: 02

All questions are compulsory

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Section A   **[10 X 2 = 20Marks]**

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Ques 1. Explain the following terms: **10 marks.** (2 mark each)

     a) Atmospheric Window

     b) Spectral Reflectance Curve

     c) Resolution

     d) Interval Scale of Measurement

     e) Resampling

Ques2. a) What is a standard parallel? **2 marks**

     b) What are the different types of projections in terms of distortion and explain which mapping properties remain accurate and which will be distorted in a particular projection? **4 marks**

     c) What is the difference between a Normal cylindrical projection and a Transverse cylindrical projection? Which projection do you use in a UTM system and why? **4 marks**

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Section B   **[10 X 4 = 40 Marks]**

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Ques3. a) How can GIS be applied to hydrocarbon exploration and distribution? Give atleast three applications. **6 marks**

     b) Differentiate between a True color composite and a False color composite? **4 marks**

Ques4. a) What is the distinction between a discrete map and a continuous map surface? **3 marks**

     b) Define the term Georeferencing and its importance. **3 marks**
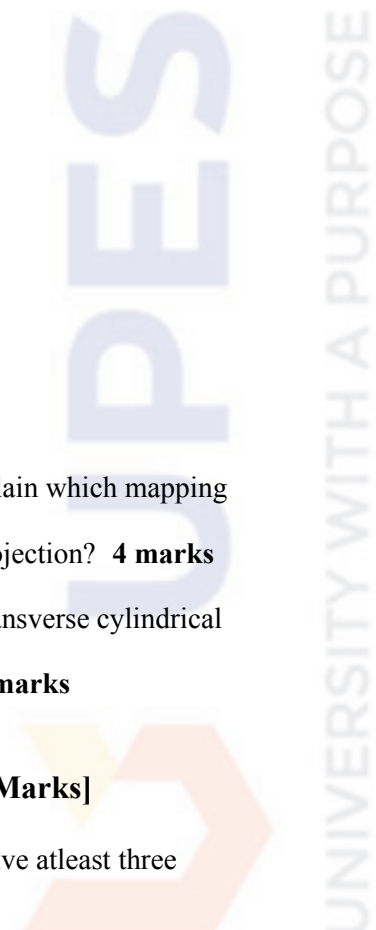
c) List the basic sources of geographic data to be used in GIS and where are they obtained from? **4 marks**

Ques5. a) What is electromagnetic spectrum, what are the major wavelength ranges used for remote sensing? **3 marks**

b) Explain the various elements of visual image interpretation in remote sensing with examples. **7 marks**

Ques6. a) If you wanted to monitor the general health of all vegetation covers over the Indian states for several months, what type of platform and sensor characteristics (spatial, spectral, and temporal resolution) would be best for this and why? **5 marks**

b) What are the major analytical tools available for vector data? Briefly describe each with suitable example. **5 marks**

Section C   [40 Marks]

Ques7. a) Discuss the advantages and disadvantages of raster and vector data? **10 marks**

b) What is Raster Map Algebra? What are the different Boolean operators used in Raster calculator? Draw truth table for each operator. **10 marks**

Ques8. a) Define and describe the Universal Transverse Mercator coordinate system? What type of developable surface is used with a UTM projection? What are the UTM zones, where is the origin of the zone and how are negative coordinates avoided? How measurements are made within a UTM system? Illustrate the UTM system with a suitable diagram. **10 marks**

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