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CE 1818 OE 32

Roll No. of candidate

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2022

B.Tech. 8th Semester End-Term Examination

CE

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM

(Open Elective-III)

(New Regulation 2017 – 2018 & New Syllabus 2018 – 2019)

Full Marks – 70   Time – Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer :   (10 × 1 = 10)

    (i)   Pixel value (DN) depends on _____ .

          (a)   Colour of the object

          (b)   Brightness/emissivity of the object

          (c)   Wavelength of the radiation

          (d)   None of above

    (ii) By itself, the term "digital image" usually refers to:

          (a)   Vector image

          (b)   Triangulated irregular network image

          (c)   Faster image

          (d)   Raster image

    (iii) Which of the following errors is produced by platform characteristics of the sensor?

          (a)   Altitude variation   (b)   Altitude

          (c)   Orbit drift   (d)   All of the above

    (iv) How many total shades of grey or colours an 8-bits image will have:

          (a)   64   (b)   128

          (c)   256   (d)   257

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(v) Off nadir viewing allows a sensor

    (a) to obtain imagery with a half-meter or finer resolution

    (b) to sense beyond the usual 8-bit range of values

    (c) to image locations not directly under the sensor

    (d) to image more than 100 bands simultaneously

(vi) The spectral region of the electromagnetic radiation which passes through the atmosphere without much attenuation is known as:

    (a) Ozone hole   (b) Atmospheric window

    (c) Ozone window   (d) Black hole

(vii) Which of the following is not a component of GIS?

    (a) Software   (b) Data

    (c) GPS   (d) Method

(viii) In a standard False Colour Composite (FCC) red colour is assigned to:

    (a) Visible band

    (b) Infrared band

    (c) Ultra violet band

    (d) Thermal infrared band

(ix) GIS, Remote Sensing and GPS technologies are:

    (a) Manual, spatial and digital

    (b) Analogue, manual and spatial

    (c) Generic, digital and spatial

    (d) Generic, analogue and spatial

(x) Which type of orbit is used by near-polar orbiting remote sensing satellites?

    (a) Circular orbit   (b) Sun-synchronous orbit

    (c) Geo-synchronous   (d) Geostationary

2. Answer any four from the following: $(4 \times 15 = 60)$

(a) Write the basic principle involved in remote sensing of earth resources. Mention the generalized processes and elements involved in remote sensing. Write the equation for Wien's displacement law and explain. If $\lambda_{max} = 0.48\,\mu$ find the temperature of the object. $(3 + 7 + 5 = 15)$

(b) Define GIS? Mention the key components of GIS. Discuss different functions of GIS. Write the Advantages and disadvantages of Raster and Vector data. $(2 + 3 + 5 + 5 = 15)$

(c) Define supervised classification. What are the basic steps involved in supervised classification. Define parametric and non-parametric algorithms of supervised classification. Discuss the Parallelpiped classifier method.

$$(2 + 3 + 4 + 6 = 15)$$

(d) How the atmosphere affects the brightness or radiance, recorded over any given point on the ground? Write the equation showing atmospheric Influences on Spectral response Patterns. Discuss the spectral reflectance characteristics of water, soil and vegetation in different spectral bands.

$$(3 + 2 + 10 = 15)$$

(e) Explain the applications of remote sensing and GIS in Land use/Landcover study or in the study of morphological features of river? (15)

(f) Discuss briefly the various elements of visual image interpretation. Draw a figure showing the hierarchal relationship among the basic image characteristics for visual interpretation. $$(10 + 5 = 15)$$