

Name:

Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020

Programme Name : B.Tech GIE

Semester: IV

Course Name : Remote Sensing

Time: 03 hrs

Course Code : ECEG 2005

Max. Marks: 100

No. of Page(s) : 2

Instructions: Attempt any two questions from Section C.

SECTION A

No.	Question	Answer Choices								Marks	CO
1	Time series remote sensing data helps find which particular type of GIS Information?	Optimum Path	Incorrect	Patterns	Correct	Locate	Incorrect	Identify	Incorrect	1	CO5
2	Modification of pixel values in an image based on surrounding pixels is which operation ?	All of the given options	Incorrect	Local	Correct	Point	Incorrect	Image Transformation	Incorrect	1	CO4
3	Human Eye is sensitive to which region of EMR?	Infrared	Incorrect	Ultraviolet	Incorrect	Visible	Correct	None of the given options	Incorrect	1	CO2

4	<p>Most remote sensing systems avoid detecting and recording wavelengths in the ultraviolet and blue portions of the spectrum. Select the INCORRECT explanation.</p>	<p>Detecting and recording the ultraviolet and blue wavelengths of radiation is difficult because of scattering and absorption in the atmosphere.</p>	<p>Incorrect</p>	<p>Ozone gas in the upper atmosphere absorbs most of the ultraviolet radiation of wavelengths shorter than about 0.25 mm.</p>	<p>Incorrect</p>	<p>After scattering the greater portion of the ultraviolet and blue wavelengths energy reaches and interacts with the Earth's surface</p>	<p>Correct</p>	<p>Rayleigh scattering affects the shorter wavelengths more severely than longer wavelengths causing the remaining UV radiation and the shorter visible wavelengths to be scattered much more than longer wavelengths</p>	<p>Incorrect</p>	<p>1</p>	<p>CO1</p>
5	<p>A satellite sensor with large area coverage and fairly coarse spatial resolution would be good for monitoring the general health status of vegetation because -----</p>	<p>large expanses of area are best covered by a sensor with a wide swath and broad coverage.</p>	<p>Incorrect</p>	<p>spatial resolution of the sensor would be fairly coarse but fine detail are necessary for monitoring a broad class such as vegetation cover</p>	<p>Correct</p>	<p>with broad areal coverage the revisit period would be shorter, increasing the opportunity for repeat coverage necessary for monitoring change</p>	<p>Incorrect</p>	<p>high spectral resolution would be at a minimum requiring channels only in the visible and near-infrared regions of the spectrum</p>	<p>Incorrect</p>	<p>1</p>	<p>CO1</p>

6	What is the maximum value of the digital number which could be represented for an image with a radiometric resolution of 4 bits?	256	Incorrect	63	Incorrect	15	Correct	16	Incorrect	1	CO1
7	Which of the following is NOT a characteristic of an image 'enhancement'.	it is basically anything that makes it easier or better to visually interpret an image.	Incorrect	with 'low-pass filtering', the enhanced image will look better than the original	Correct	an enhancement is performed usually for a specific application	Incorrect	an enhancement may be inappropriate for another purpose, which would demand a different type of enhancement.	Incorrect	1	CO4
8	Which of the following options correctly depicts the whole of the electromagnetic spectrum from the longest wavelengths to the shortest ones and everything in between?	Gamma Ray > X-ray > Ultraviolet > Visible > Infrared > Microwave > Radio	Incorrect	Radio > Microwave > Infrared > Visible > Ultraviolet > X-ray > Gamma Ray	Correct	Radio > X-ray > Infrared > Visible > Ultraviolet > Microwave > Gamma Ray	Incorrect	Gamma Ray > Microwave > Infrared > Visible > Ultraviolet > X-ray > Radio	Incorrect	1	CO2
9	Which of the following is NOT an accurate descriptor of the relationship between wavelength and frequency utilised for remote sensing.	the two are inversely related to each other	Incorrect	the shorter the wavelength, the higher the frequency	Incorrect	the longer the wavelength, the lower the frequency	Incorrect	understanding the characteristics of EM radiation in terms of wavelength is sufficient for an	Correct	1	CO2

								understanding of the information to be extracted from remote sensing data			
10	Image subtraction is used for which of the following -----	color enhancement	Incorrect	frequency enhancement	Incorrect	spatial enhancement	Incorrect	change detection	Correct	1	CO3
11	The technique to transform a correlated dataset into uncorrelated dataset is called -----	Fusion	Incorrect	Ratioing	Incorrect	Classification	Incorrect	Principal Component Analysis	Correct	1	CO4
12	The sum of weights in a low pass filter is ----- -	0	Correct	1	Incorrect	2	Incorrect	3	Incorrect	1	CO3
13	If you want to prepare a land use map from remote sensing imagery you will -----	Perform Classification	Correct	Do Field survey	Incorrect	Apply low pass filter	Incorrect	Do PCA	Incorrect	1	CO5
14	Which of the following is INCORRECT concerning current Landsat instruments?	The smallest area on the ground measured is 60m square	Correct	Designed to detect visible and infrared wavelengths	Incorrect	Primarily measure light that's reflected from Earth's surface	Incorrect	Need an understanding of spectral signatures to interpret Landsat data.	Incorrect	1	CO1
15	In Hyperspectral data cube, x and y represent spatial data and z axis representsdata.	Spectral	Correct	Radiometric	Incorrect	Temporal	Incorrect	Time-Series	Incorrect	1	CO3

16	Blurring becomes more severe as the size of the kernel	Decreases	Incorrect	Increases	Correct	Becomes zero	Incorrect	None of the given options	Incorrect	1	CO4
17	Modification of pixel values in an image independantly is which operation ?	All of the given options	Incorrect	Local	Incorrect	Point	Correct	Image Transformation	Incorrect	1	CO4
18	Process involved in linear spatial filtering is	convolution	Correct	histogram equalization	Incorrect	both A and B	Incorrect	edge enhancement	Incorrect	1	CO5
19	The process of extracting information from the image is known as	Image enhancement	Incorrect	Image restoration	Incorrect	Image Analysis	Correct	Image compression	Incorrect	1	CO3
20	Image restoration helps to improve the _____ of the image	quality	Correct	noise	Incorrect	intensity	Incorrect	colour	Incorrect	1	CO4
21	Sharpening filters are used to -----	highlight the bright transitions	Incorrect	highlight the low transitions	Incorrect	highlight the intensity transitions	Correct	highlight the colour transitions	Incorrect	1	CO2
22	To study the effects of drought on vegetation, which portion of the electromagnetic spectrum is most relevant	Thermal infrared	Incorrect	Middle infrared	Incorrect	Near infrared	Correct	Red spectrum	Incorrect	1	CO5
23	Living vegetation appears on false-color IR images	Red	Correct	Black	Incorrect	White	Incorrect	Blue	Incorrect	1	CO5
24	Which form of representation does a paper map use -----	Analogue	Correct	Digital	Incorrect	Binary	Incorrect	Decimal	Incorrect	1	CO1

25	Variation in the shape, size and texture of objects may be called as	Spatial Variation	Correct	Spectral Variation	Incorrect	Temporal Variation	Incorrect	None of the given options	Incorrect	1	CO1
26	The spectral region of the electromagnetic radiation where the atmosphere is transparent is known as	ozone hole	Incorrect	ozone window	Incorrect	black hole	Incorrect	atmospheric window	Correct	1	CO2
27	Single band image is obtained from	LISS-III	Incorrect	Pan	Correct	both A and B	Incorrect	None of the given options	Incorrect	1	CO3
28	Which of the following is an active remote sensing system?	Aerial photography	Incorrect	Satellite imagery	Incorrect	Orthoimagery	Incorrect	LiDAR	Correct	1	CO3
29	When electromagnetic radiation of a specific wave length interacts with a target to study its scattered radiance, it is called	active remote sensing	Correct	passive remote sensing	Incorrect	neutral remote sensing	Incorrect	All of the given options	Incorrect	1	CO2
30	The difference between the minimum and maximum intensity in an image is a measure of -----	Saturation	Incorrect	Noise	Incorrect	Contrast	Correct	Brightness	Incorrect	1	CO4
31	Points with known locations in input and reference images during geometric transformations are known as -----	Known Points	Incorrect	Control Points	Correct	Key Points	Incorrect	Spatial Points	Incorrect	1	CO5

32	The process of converting continuous values of the image into its digital equivalent is called	Quantization	Correct	Rasterization	Incorrect	Sampling	Incorrect	None of the given options	Incorrect	1	CO5
33	The process of expanding the range of intensity levels in an image to fill the entire display range is called	Histogram equalization	Incorrect	Shading Correction	Incorrect	Contrast Stretching	Correct	All of the given options	Incorrect	1	CO4
34	Highlighting a particular range of brightness level to give it a specific color is called-----	Intensity Matching	Incorrect	Density Slicing	Correct	Intensity highlighting	Incorrect	None of the given options	Incorrect	1	CO5
35	Histogram Equalization is used for-----	Contrast Adjustment	Incorrect	Blurring	Incorrect	Image Enhancement	Correct	Edge Enhancement	Incorrect	1	CO4
36	The process of accepting or rejecting certain frequency components is known as	Filtering	Correct	Eliminating	Incorrect	Slicing	Incorrect	None of the given options	Incorrect	1	CO4
37	An object reflecting more energy has DN value that is	Medium	Incorrect	Low	Incorrect	High	Correct	Zero	Incorrect	1	CO1
38	When pixels are multiplied by different coefficients it is called-----	Spatial Average	Correct	Weighted Average	Incorrect	Squared Average	Incorrect	None of the given options	Incorrect	1	CO3
39	Panchromatic band in Landsat -8 has a resolution of-----	1 m	Incorrect	5 m	Incorrect	15 m	Correct	30 m	Incorrect	1	CO3

59	Landsat, SPOT providing multispectral data are passive systems whereas Airborne Synthetic Aperture Radar (SAR) or LiDAR data are active systems.	TRUE	FALSE							1	CO2
60	In Supervised classification, the analyst does not have to rely on ancillary data sources, such as aerial photography, existing GIS coverages, or field visits to identify the training sites.	FALSE	TRUE							1	CO5

SECTION B

Q 1.	Comment on the various issues that affect the selection of satellite images for different applications. Based on the issues identified, describe any two applications that made you choose different images for the intended purpose.	10	CO1
Q 2.	Though the satellite-based sensors have advanced tremendously, still airborne remote sensing is used regularly for a variety of applications. What are the possible reasons that the user still opts for airborne remote sensing? Provide two specific examples that show advantages of airborne remote sensing over satellite based remote sensing.	10	CO2
Q 3.	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 10 grey values.	10	CO3
Q 4.	Change detection techniques in remote sensing tries to record the temporal natural and anthropogenic transitions of land use/land cover on Earth's surface. Why is it necessary to consider appropriate spatial and temporal scale when developing a land use and land cover change detection study? Site a suitable example to justify your answer.	10	CO4

