Enrolment No:



Semester: IV

Max. Marks: 100

Time: 03 hrs

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

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Programme Name: B.Tech GIE

Course Name : Remote Sensing

Course Code : ECEG 2005

No. of Page(s) : 2

Instructions: Attempt any two questions from Section C.

SECTION A

No.	Question				Answe	r Choices				Marks	СО
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	All of the									
	on surrounding pixels is	given options						Image			
	which operation?		Incorrect	Local	Correct	Point	Incorrect	Transformation	Incorrect	1	CO4
3	Human Eye is sensitive										
	to which region of	Infrared						None of the			
	EMR?		Incorrect	Ultaviolet	Incorrect	Visible	Correct	given options	Incorrect	1	CO2

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

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								an			
		it is basically						enhancement			
		anything that		with 'low-				may be			
		makes it		pass				inappropriate			
		easier or		filtering', the		an		for another			
		better to		enhanced		enhancement		purpose, which			
	Which of the following	visually		image will		is performed		would demand			
	is NOT a characteristic	interpret an		look better		usually for a		a different type			
	of an image	image.		than the		specific		of			
	'enhancement'.		Incorrect	original	Correct	application	Incorrect	enhancement.	Incorrect	1	CO4
8	Which of the following	G B		5 . 11							
	options correctly depicts	Gamma Ray		Radio >		D 1' T7		G P			
	the whole of the	> X-ray >		Microwave		Radio > X-		Gamma Ray >			
	electromagnetic	Ultraviolet >		> Infrared >		ray > Infrared		Microwave >			
	spectrum from the	Visible >		Visible >		> Visible >		Infrared >			
	longest wavelengths to	Infrared >		Ultraviolet >		Ultraviolet >		Visible >			
	the shortest ones and	Microwave >	.	X-ray >		Microwave >	_ ,	Ultraviolet >		4	
	everything in between?	Radio	Incorrect	Gamma Ray	Correct	Gamma Ray	Incorrect	X-ray > Radio	Incorrect	1	CO2
9	Wileiale of the Callernia							understanding the			
	Which of the following is NOT an accurate							characteristics			
				the shorter				of EM			
	descriptor of the			the snorter				of EM radiation in			
	relationship between wavelength and	the two are		wavelength,		the longer the		terms of			
	frequency utilised for	inversely		•		wavelength,		wavelength is			
		related to		the higher the		the lower the		sufficient for			
	remote sensing.	each other	Incomment		Incommost		Incomment		Commont	1	CO2
		each other	Incorrect	frequency	Incorrect	frequency	Incorrect	an	Correct	1	CUZ

								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 represents	•		J		Temporal		Time-Series			

16	Blurring becomes more severe as the size of the					D		None of the			
	kernel	Decreases	Incorrect	Increases	Correct	Becomes zero	Incorrect	given options	Incorrect	1	CO4
17	Modification of pixel	Decreases	Incorrect	mercuses	Correct	ZCIO	Incorrect	given options	Incorrect		1004
	values in an image										
	independantly is which	All of the						Image			
	operation ?	given options	Incorrect	Local	Incorrect	Point	Correct	Transformation	Incorrect	1	CO4
18	Process involved in			histogram				edge			
	linear spatial filtering is	convolution	Correct	equalization	Incorrect	both A and B	Incorrect	enhancement	Incorrect	1	CO5
19	The process of extracting										
	information from the	Image		Image		Image		Image			
	image is known as	enhancement	Incorrect	restoration	Incorrect	Analysis	Correct	compression	Incorrect	1	CO3
20	Image restoration helps										
	to improve the										
	of the	aa1:4			T .	:	_ ,	0.010.00		4	604
21	image	quality	Correct	noise	Incorrect	intensity	Incorrect	colour	Incorrect	1	CO4
21	Sharpening filters are	highlight the bright		highlight the low		highlight the intensity		highlight the colour			
	used to	transitions	Incorrect	transitions	Incorrect	transitions	Correct	transitions	Incorrect	1	CO2
22	To study the effects of	transitions	Incorrect	transitions	Incorrect	transitions	Correct	transitions	Incorrect		CO2
	drought on vegetation,										
	which portion of the										
	electromagnetic										
	spectrum is most	Thermal		Middle							
	relevant	infrared	Incorrect	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	Spatial		Spectral		Temporal		None of the			
	objects may be called as	Variation	Correct	Variation	Incorrect	Variation	Incorrect	given options	Incorrect	1	CO1
26	The spectral region of										
	the electromagnetic										
	radiation where the										
	atmosphere is			ozone				atmospheric			
	transparent is known as	ozone hole	Incorrect	window	Incorrect	black hole	Incorrect	window	Correct	1	CO2
27											
	Single band image is							None of the			
	obtained from	LISS-III	Incorrect	Pan	Correct	both A and B	Incorrect	given options	Incorrect	1	CO3
28	Which of the following										
	is an active remote	Aerial		Satellite							
	sensing system?	photography	Incorrect	imagery	Incorrect	Orthoimagery	Incorrect	LiDAR	Correct	1	CO3
29	When electromagnetic										
	radiation of a specific										
	wave length interacts										
	with a target to study its			passive		neutral					
	scattered radiance, it is	active remote		remote		remote		All of the			
	called	sensing	Correct	sensing	Incorrect	sensing	Incorrect	given options	Incorrect	1	CO2
30	The difference between										
	the minimum and										
	maximum intensity in an										
	image is a measure of	Catanation	_	Naisa	_ ,	Comtract		Dui alata aga	-	4	604
31	Points with known	Saturation	Incorrect	Noise	Incorrect	Contrast	Correct	Brightness	Incorrect	1	CO4
31											
	locations in input and reference images during										
	geometric										
	transformations are	Known		Control							
	known as	Points	Incorrect	Points	Correct	Key Points	Incorrect	Spatial Points	Incorrect	1	CO5
	MIO WII WO	1 011165	montect	1 Office	Correct	Ticy I office	Incorrect	Spatial I office	Incorrect		203

32	The process of										
	converting continuous										
	values of the image into										
	its digital equivalent is							None of the			
	called	Quantization	Correct	Rasterization	Incorrect	Sampling	Incorrect	given options	Incorrect	1	CO5
33	The process of										
	expanding the range of										
	intensity levels in an										
	image to fill the entire	Histogram		Shading		Contrast		All of the			
	display range is called	equalization	Incorrect	Correction	Incorrect	Stretching	Correct	given options	Incorrect	1	CO4
34	Highlighting a particular										
	range of brightness level										
	to give it a specific color	Intensity		Density		Intensity		None of the			
	is called	Matching	Incorrect	Slicing	Correct	highlighting	Incorrect	given options	Incorrect	1	CO5
35	Histogram Equalization	Contrast				Imaga		Edaa			
	Histogram Equalization is used for		T	Dl. min a	_	Image Enhancement		Edge Enhancement	T .	4	CO4
26		Adjustment	Incorrect	Blurring	Incorrect	Emancement	Correct	Emiancement	Incorrect	1	C04
36	The process of accepting										
	or rejecting certain							None of the			
	frequency components is	Eiltonin o	C	Eliminatina	T 4	Clining	T		T	4	604
27	known as	Filtering	Correct	Eliminating	Incorrect	Slicing	Incorrect	given options	Incorrect	1	CO4
37	An object reflecting	Medium		T		III ale		Zero			
	more energy has DN value that is	Medium	T 4	Low	T 4	High	C	Zero	T	4	601
38			Incorrect		Incorrect		Correct		Incorrect	1	CO1
38	When pixels are										
	multiplied by different coefficients it is called	Spatial		Weighted		Sayarad		None of the			
	coefficients it is called	1	C	_	T 4	Squared	T		T	1	CO3
20	Panchromatic band in	Average	Correct	Average	Incorrect	Average	Incorrect	given options	Incorrect	1	CU3
39	Landsat -8 has a										
		1	T 4	<i>5</i>	.	15		20		4	603
	resolution of	1 m	Incorrect	5 m	Incorrect	15 m	Correct	30 m	Incorrect	1	CO3

1 40		1	I	İ	İ	İ	I	İ	1		1 1
40	Amongst the following										
	techniques which is not										
	considered a type of										
	radiometric correction										
	used in image processing										
	when there is										
	interference with the			Ozone							
	radiance measured by an	Noise		depletion		Haze		Sun angle			
	instrument?	Removal	Incorrect	correction	Correct	correction	Incorrect	correction	Incorrect	1	CO3
41	What should be done for					Perform a					
	assessing the accuracy of	Make an		Check the		pixel level		All of the			
	a LULC study .	error matrix	Correct	topology	Incorrect	classification	Incorrect	given options	Incorrect	1	CO5
42	Min-Max contrast stretch										
	is applied to a single										
	band image having										
	minimum values =0 and										
	maximum value of 255.										
	The resulting 8 bit										
	display system will show										
	no improvement in										
	contrast.	FALSE	TRUE							1	CO4
43	Ground based platforms										
	are used to collect										
	detailed information										
	about the surface.	TRUE	FALSE							1	CO2
44	Scattering helps to										
	illuminate the objects in										
	the shadows.	TRUE	FALSE							1	CO3

45	A hand-held							
	spectrometer is used to							
	measure the spectral							
	signatures of different							
	surface types on the							
	ground so that when the							
	spectral signature of a							
	surface in a satellite							
	image is analysed, the							
	surface type can be							
	correctly identified on							
	the basis of the							
	frequencies of the							
	different wavelengths.	FALSE	TRUE				1	CO2
46	Undesirable differential							
	illumination effects are							
	reduced by band							
	rationing	TRUE	FALSE				1	CO3
47	Histogram Equalization							
	increases the contrast in							
	the tails of the image	FALSE	TRUE				1	соз
48	High pass filters are used							
	for Edge detection and							
	Enhancement	TRUE	FALSE				1	CO4
49	The percentage of							
	energy reflected by a							
	particular type of surface							
	at its various constituent							
	wavelengths is termed its							
	'spectral signature'.	TRUE	FALSE				1	CO1
50	Kappa coefficient is a							
	technique for spatial							
	convolution	FALSE	TRUE				1	CO5

51	Enhancement techniques							
	should be applied to an							
	image before geometric							
	corrections	FALSE	TRUE				1	CO4
52	If Contrast ratio is more							
	it is difficult to interpret	FALSE	TRUE				1	CO2
53	an image.	FALSE	IKUE				1	CO2
33	Mean and Median are types of Low pass filters	TRUE	FALSE				1	CO3
54		TROL	TALSE				т_	CO3
54	Rough textures show high spatial frequency	FALSE	TRUE				1	CO3
55	Density Slicing is used	FALSE	INUE				Т.	CO3
33	to give colors to							
	brightnesses of a single							
	band	TRUE	FALSE				1	CO4
56	CDF stands for							
	Combined Distributive							
	Function	FALSE	TRUE				1	CO4
57	OLI and TIRS are							
	sensors aboard Landsat-7	FALSE	TRUE				1	CO5
58	NDVI is an index of							
	chlorophyll content in							
	the vegetation that							
	results from light							
	interacting with the							
	vegetation canopy.	FALSE	TRUE				1	CO5

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