Nirma University

Institute of Technology

Class Test, February 2023

B. Tech. in CS/IC/EC, Semester-VI

2CLOE02 REMOTE SENSING, GIS & GPS

Roll / Exam No. | Supervisor's initial with date

Time: 1 Hour 15 Minutes | Max. Marks: 35

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Assume suitable data whenever required.
4. Draw neat sketches wherever necessary.

Q.1 CO1 BL2	Explain remote sensing? Describe advantages and application of remote sensing.	[07]
Q.2 CO1 BL2	Describe the spectral reflectance curve. Explain spectral reflectance of vegetation, soil and water.	[07]
Q.3 CO1 BL3	Discuss: Spectral resolution, Spatial resolution, Radiometric resolution, Temporal Resolution	[07]
Q.4 CO1 BL2	Explain various stages of Remote sensing with illustrative diagram.	[07]
Q.5 CO1 BL2	Describe Panchromatic, Multispectral and hyperspectral Image in remote sensing with appropriate diagram.	[07]

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Class Test, February - 2023

B.Tech. in Computer Science & Engineering, Semester-VI

2CS601 – Theory of Computation (THOC)

Roll/ Exam No. | Supervisor's initial with date

Time: 1 Hour 15 minutes | Max. Marks: 35

Instructions:
1. Attempt all questions.
2. Figures to the right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Make suitable assumptions wherever necessary and specify them.

Q-1	**Construct DFA for the following languages**	**[20]**
(A)	L={ At least one 'a' and exactly two 'b' over Σ={a,b} }	(05)
(B)	L={ ab^5wb^2, where w∈{a,b}* }	(05)
(C)	L={ w_1aw_2, where $\|w_1\|>=3$, $\|w_2\|<=5$, and w∈{a,b}* }	(05)
(D)	L={ String does not contain the substring 'aa' over Σ={a,b) }	(05)

Q-2	**Find the Regular Expression (RE) for the following languages**	**[08]**
(A)	L={ a^nb^m |n+m is even }	(04)
(B)	L={ String ending with '1' and not containing '00' substring over Σ={0,1) }	(04)

Q-3	**Answer the following questions:**	**[07]**
(A)	Prove the following by Mathematical Induction: $1\cdot3 + 3\cdot5 + 5\cdot7 + \ldots + (2n-1)(2n+1) = (1/3)\{n(4n^2 + 6n - 1)\}$.	(05)
(B)	Let A, B, and C be non-empty sets where X=(A−B)−C and Y=(A-C)-(B-C). State the relation between X & Y with a suitable example.	(02)

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Nirma University

Institute of Technology

Class Test (IR), February 2023

B.Tech in Computer Science & Engineering, Semester: VI

2CSDE67: Cloud Computing

Roll/ Exam No | | Supervisor's initial with date | 20/2/23

Time : 75 minutes | Max Marks: 35

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.

Q-1 Answer the following **[15]**

A CLO-2 BL-5 Which *deployment model* of Cloud Computing is associated with the following mentioned scenarios? (3)

Scenario I:
The Cloud resources (like servers and storage) are owned and operated by a third-party Cloud service provider and delivered over the internet. In this Cloud, you share the same hardware, storage, and network devices with other organizations or cloud "tenants," and you access services and manage your account using a web browser.

Scenario II:
This Cloud consists of cloud computing resources used exclusively by one business or organization. This Cloud can be physically located at your organization's on-site data center, or it can be hosted by a third-party service provider. Also in this Cloud, the services and infrastructure are always maintained on an intranet network and the hardware and software are dedicated solely by the organization.

Scenario III:
This cloud integrates infrastructure components on-premises, private, and public Cloud sources into one centralized, distributed computing environment. It enables you to manage and orchestrate traditional and cloud-native workloads across various infrastructure components, allowing you to use the most suitable resource for each scenario while centralizing management.

B CLO-3 BL-3 For the given Cloud Computing Stack Table, identify one keyword for the "main access and management tool" column and at least two keywords for the "service content" column. (6)

Table 1: Cloud computing stack table

Service Class	Main access and management tool	Service content
SaaS		
PaaS		
IaaS		

C CLO-2 BL-2 How the below-mentioned problems can be solved? Think of yourself as a Cloud Service Provider (CSP) and identify how you will deal with such problems of the end users (***Problem 1***) as well as themselves (***Problem 2***). (6)

Problem 1: Cloud lock-in (also known as vendor lock-in or data lock-in) occurs when transitioning data formats, products, or services to another vendor's platform is difficult and costly, making customers more dependent (locked-in) on a single cloud storage solution.

Problem 2: Data centers consume large amounts of electricity and impact to the environment in terms of CO2 emissions.

Q-2 Do as directed **[20]**

A CLO-2 BL-2 How Virtualization plays an important role in Cloud Computing and in the utilization of Cloud resources? Mention the various virtualization levels ranging from Hardware to Applications. Also, provide one example for each level of virtualization. (10)

B CLO-4 BL-2 Justify the following statement with an example and diagram: (5)

"A Virtual Machine (VM) runs with a guest OS, which is often different from the host OS, that manages the resources of the Physical Machine (PM), where the VM is implemented."

C CLO-1 BL-1 What are Hot (Live) and Cold Migrations? Why Migration is an important factor in Cloud Computing? Elaborate on the same with an example. Which stage of the migration process results in downtime (VM out of service) of the Cloud Computing? (5)

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Class test, February 2023

*B. Tech. in Computer Science and Engineering, Semester-VI

2CSDE53 INFORMATION RETRIEVAL SYSTEMS

Roll / Exam No.		Supervisor's initial with date	21/2/23

Time: 1 Hour 15 Minutes | Max. Marks : 35

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Assume suitable data wherever necessary.

Q-1 CLO2 Are the following statements true or false? Justify your answer. **[9]**

a. Stemming increases the size of the vocabulary.
b. In a Boolean Retrieval system stemming never lowers precision.
c. Skip pointers are useful in the context of indexing.
d.

Q-2 CLO3 Shown below is a portion of a positional index in the format: term: <doc1: <position1, position2, . . . >; doc2: <position1, position2, . . .>; etc. **[6]**

angels: 2: <36,174,252,651>; 4: <12,22,102,432>; 7: <17>;
fools: 2: <1,17,74,222>; 4: <8,78,108,458>; 7: <3,13,23,193>;
fear: 2: <87,704,722,901>; 4: <13,43,113,433>; 7: <18,328,528>;
in: 2: <3,37,76,444,851>; 4: <10,20,110,470,500>; 7: <5,15,25,195>;
rush: 2: <2,66,194,321,702>; 4: <9,69,149,429,569>; 7: <4,14,404>;
to: 2: <47,86,234,999>; 4: <14,24,774,944>; 7: <199,319,599,709>;
tread: 2: <57,94,333>; 4: <15,35,155>; 7: <20,320>;
where: 2: <67,124,393,1001>; 4: <11,41,101,421,431>; 7: <16,36,736>;

In following queries, each expression within quotes is a phrase query. Which of the above document(s) match the query? Write proper explanation of your answer.
a. "fools rush in"
b. "fools rush in" AND "angels fear to tread"

Q-3 CLO2 Which of the following representation will result into sparse matrix? Justify your answer. Discuss mechanism to deal with sparsity issue. **[6]**
(i) Boolean representation (ii) Weighted(normalized) TF representation (iii) TF-IDF representation

Q-4 CLO3 "The term appearing in a large number of documents in the collection, is probably not significant or discriminative." Give your remarks on this statement with appropriate justification. **[6]**

Q-5 **CLO1** What are the issues with bioword indexing mechanism when used to handle phrase query ? Justify your answer. **[4]**

Q-6 **CLO1** Recommend a query processing order for **[4]**

(tangerine OR trees) AND (marmalade OR skies) AND (kaleidoscope OR eyes) given the following postings list sizes:

Term	Postings size
eyes	213312
kaleidoscope	87009
marmalade	107913
skies	271658
tangerine	46653
trees	316812

Nirma University

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Class Test, February 2023

B. Tech. in Computer Science & Engineering, Semester - VI

2CSDE69 LAMP TECHNOLOGY

Roll/ Exam No. _____ Supervisor's initial with date 21/2

Time: 1 Hour 15 Minutes Max.Marks: 35

Instructions:
1. Attempt all questions & use appropriate indentations in code.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Assume suitable data wherever required and mention those.

Q-1. CO 1 BL 2 Which are the various components of LAMP model? Explain each component in brief. How to declare Associative Arrays in PHP? Demonstrate associative array with an example PHP script. Also write down code snippet to iterate through associative array using foreach loop concept. [10]

Q-2. CO 3 BL 3 **Write a PHP script/s for the following functionalities:** [10]

I. Scan a number from the user. Use POST method, $_POST super global variable and Pass by reference concepts.

II. Write a PHP function that check whether numbers are an amicable number or not. An amicable number (m,n) consists of two integers m,n for which the sum of proper divisors (the divisors excluding the number itself) of one number equals the other.
For example, let's show that 220 & 284 are amicable numbers:
First, we find the proper divisors of 220: 1, 2, 4, 5, 10, 11, 20, 22, 44, 55, 110
If you add up all of these numbers you will see that they sum to 284.
Now find the proper divisors of 284: 1, 2, 4, 71, 142
These sum to 220, and therefore 220 & 284 are amicable numbers.

III. Call amicable function (as mentioned in point II) using a number scanned from the user and print appropriate message i.e Number amicable or not.

Q-3. CO 3 BL 3 **Design a PHP web page which asks user to enter a paragraph, search string, replace string and occurrence number. Write down code to perform the following tasks.** [15]

I. Display total no of sentences in paragraph.

II. Display the total number of words in each sentence.

III. Replace specific occurrence (as entered by the user) of search string in paragraph using replace string.
Sample Example:
Inputs:
Paragraph: CSE Department. CSE Department. CSE Department.

Search String: CSE

Replace String: Computer Science & Engineering

Occurrence Number: 2

Output:

Paragraph: CSE Department. Computer Science & Engineering Department. CSE Department.

IV. Display the total number of characters in the entire paragraph.

Assume each sentence is terminated by period(.).

****** Best of Luck ******