G. H. RAISONI UNIVERSITY, AMRAVATI

SCHOOL OF ENGINEERING & TECHNOLOGY

END SEMESTER EXAMINATION (SUMMER 2024)

B.Tech

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE AND ENGINEERING

(SIX SEMESTER)

Course: NATURAL LANGUAGE PROCESSING **Course Code: UAIT302**
Time: 2:30 Hours **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Demonstrate approaches to generation, dialogue and summarization within NLP.
CO2.	Apply current methods for statistical approaches to machine translation
CO3	Recognize the significance of pragmatics for natural language understanding
CO4.	Developed useful systems for language processing and related tasks involving text processing
CO5.	Use of NLP methods to analyses sentiment of a text document.

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.
4. Scientific calculator allowed

Q.1) A

a) How many bigrams can be generated from the sentence "every computer science students must know a programming language"? 1M CO1

b) How many edit distance is required to correct the misspelled word "appler" to "apple"? 1M CO1

Q.1) B Solve Any Two

a) What is Natural Language Processing? Mention the different phases in natural language processing. 4M CO1

b) Compute the bigram probability of the sentence "students are from Nagpur" from the given dataset 4M CO1

<s> i am from Nagpur </s>
<s> i am an instructor </s>
<s> students are good and are from various cities </s>
<s> students from Nagpur do engineering </s>

c) What is POS-Tagging? Explain the Hidden Markov Model with a neat diagram. 4M CO1

Q.2) A

a) What is tf-idf? 1M CO2

b) To apply CYK algorithm, a grammar must be in CNF form. (True/False) 1M CO2

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Q.2) B Solve Any Two

a) What is Semantics? Write a note on Distributional Semantics and its hypothesis. 4M CO2

b) Explain the Context Free Grammer in NLP with examples. 4M CO2

c) Compute the Jacard and Dice similarity given the two binary distributions. 4M CO2

X = [1 1 1 1 1 1 0 0 0 0 0 0]

Y = [0 0 0 0 0 1 0 0 0 0 0 0]

Q.3) A

a) What do you mean by Lexicon and Lexeme? 1M CO3

b) The process of using the Wikipedia as a database is known as? 1M CO3

Q.3) B Solve Any Two

a) What are the different types of Lexical Relation? 4M CO3

b) What is Topic Model? Define Latent Dirichlet Allocation(LDA) with the Graphical/Plate representation with neat labelling. 4M CO3

c) What is Entity Linking? Why do we need Entity Linking? 4M CO3

Q.4) A

a) What is Information Extraction? 1M CO4

b) What do you mean by summary? 1M CO4

Q.4) B Solve Any Two

a) What is Named Entity Recognition? Mention the needs for Information Extraction. 4M CO4

b) Compute the probability of the topic assignment of the test data given in the table using Naïve Bayes with add-1 smoothing. 4M CO4

	doc	words	class
training data	1	chinese bejing chinese	c
	2	chinese chinese shanghai	c
	3	chinese macau	c
	4	tokyo japan chinese	j
test data	5	chinese chinese chinese tokyo japan	?

c) What is Text Summarization? Mention the applications of the Text Summarization. 4M CO4

Q.5) A

a) What is polarity of a sentiment? 1M CO5

b) What do you mean by Opinion? 1M CO5

Q.5) B Solve Any Two

a) What is Sentiment Analysis? What are the key reasons why sentiment analysis is important for business? 4M CO5

b) What are the key challenges in aspect based sentiment analysis.

c) Write a note on Automatic Speech Recognition with the neat diagram.

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END SEMESTER EXAMINATION (SUMMER 2024)
BACHELOR OF TECHNOLOGY IN BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING / BACHELOR OF TECHNOLOGY IN ELECTRICAL ENGINEERING / BACHELOR OF TECHNOLOGY IN ELECTRONICS & TELECOMMUNICATION / BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE & ENGINEERING

(SIX SEMESTER)

Course: UNIVERSAL HUMAN VALUE UNDERSTANDING HARMONY **Course Code: UHUT304**

Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Students are expected to become more aware of themselves.
CO2.	Students are expected to become more aware of their surroundings. (family, society, nature).
CO3	Students should become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO4.	Students would have better critical ability, they would also become sensitive to their commitment towards what they have understood ,(human values, human relationship and human society).
CO5.	Students would be able to apply what they have learnt to their own self in different day-to-day settings in real life.

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1 A) Attempt All

a) What is Values? 1M CO1

b) Define Value Education. 1M CO1

Q.1B) Solve Any Two

a) What do you understand by the terms svatva, swatantrata and swarajya? 4M CO1

b) What are the basic guidelines for value education? 4M CO1

c) Explain the process of self-exploration with a diagram. 4M CO1

Q.2 A) Attempt All

a) Define Sensation. 1M CO2

b) Define Pre-Conditioning. 1M CO2

Q.2 B) Solve Any Two

a) The needs of the self are qualitative. Illustrate. 4M CO2

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b) What is Imagination? Explain with example. 4M CO2

c) What are the needs of the 'self' and the 'body'? 4M CO2

Q.3 A) Attempt All

a) What is Family? 1M CO3

b) What is Gratitude? 1M CO3

Q.3 B) Solve Any Two

a) Explain Trust in Detail. 4M CO3

b) What is Love? How can you say that love is the complete value? 4M CO3

c) Explain the problem faced due to Discrimination in relationship. 4M CO3

Q.4 A) Attempt All

a) Define GATHANSHEEL. 1M CO4

b) Define Kriyapurnata and Acharanpurnata 1M CO4

Q.4 B) Solve Any Two

a) What do you mean by Co-Existence? 4M CO4

b) What is SANSKAR? Explain its effects. 4M CO4

c) Explain the difference and similarity between human being and Animals. 4M CO4

Q.5 A) Attempt All

a) ----------is the implication of right understanding in profession. 1M CO5

a) professional ethics b) ethics

b) Holistic production systems are eco-friendly and People-Friendly. **(True/False)** 1M CO5

Q.5 B) Solve Any Two

a) What is ethical human conduct? Explain in terms of values, policies and character. 4M CO5

b) "When there is no utility there is no scope for art too." Explain. 4M CO5

c) What do you mean by Professional Ethics? 4M CO5

CHRUA

G H RAISONI UNIVERSITY, AMRAVATI

SCHOOL OF ENGINEERING & TECHNOLOGY

END SEMESTER EXAMINATION (SUMMER 2024)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE & ENGINEERING

(SIXTH SEMESTER)

Course: INFORMATION SECURITY SYSTEM ENGINEERING | **Course Code: UIST 306**

Time: 2:0Hrs | **Max. Marks: 50**

Course Outcomes (CO):

Upon completion of the course, students will be able to

CO1 Introduction / gdb / buffer overflow

CO2 Preventing buffer overflow based malware, Integer overflow and buffer over read and heap overflow

CO3 More on heap overflow; Access Control, Confinement

CO4 SGX and Trust zone, Micro-architectural Attacks

CO5 Hardware Security

Instructions to Candidates:

1. Attempt all the questions of Section A.
2. Attempt Any Four Questions of Section B.
3. Each Question carry 1 Mark, there is no negative marking.

Q.1A) Solve - Objective type questions. (Difficulty Level – Moderate)

1) The floating point flaw of Intel Pentium 4 is an example of _____ flaw
   a. Software Flaws
   b. Hardware Flaws
   c. Design Flaw
   d. There is no such flaw

   1M CO1

2) Malicious code segments can be pushed into _____ during execution and can result in _____ attack.
   a. Stack, buffer overflow
   b. Queue, control flow
   c. Control flow, Stack
   d. Stack, control flow

   1M CO1

3) Which of the following should you pay attention to when ensuring that a specific source code is devoid of buffer overflow vulnerabilities?
   1. The presence of scanf in the code
   2. The presence of strcpy in the code
   3. The presence of for loops that manipulate arrays

   1M CO1

   a. Statement 1 and 2 are True and statement 3 is False
   b. Statement 1 and 3 are True and statement 2 is False
   c. Statement 2 and 3 are True and statement 1 is False
   d. All the statements 1,2 and 3 are True

GHRUA

4) For a successful buffer overflow attack, an attacker should be able to do
1. Overwrite the return address
2. Should be able to inject code
3. Able to determine the location of the code

1M CO1

a. Statement 1 and 2 are True and statement 3 is False
b. Statement 1 and 3 are True and statement 2 is False
c. Statement 2 and 3 are True and statement 1 is False
d. All the statements 1,2 and 3 are True

5) Which of the following is a layer of protection for Security?
1.Platform-levelprotection
2.Application-levelprotection
3.Record-levelprotection

1M CO1

a. Statement 1 and 2 are True and statement 3 is False
b. Statement 1 and 3 are True and statement 2 is False
c. Statement 2 and 3 are True and statement 1 is False
d. All the statements 1,2 and 3 are True

6) Arguments can be provided to gdb in the following ways
I. gdb ./a.out
(gdb) r arg1 arg2 arg3 arg4
II. gdb --args ./a.out arg1 arg2 arg3 arg4

1M CO1

Which of them is correct?
a. Only I is correct
b. Only II is correct
c. Both are True
d. Both are False

Q.1B) Solve any Four (Difficulty Level – High)

1) Match the following
1. Instructions ---------- text section
2 Uninitialized global variable---------- Stack section
3 Function call invocation---------- bss section
4 Dynamic allocation---------- Heap section
5 Initialized static variable---------- data section

1M CO1

a. Statement 1,4,5 are True and Statement 2,3 are False
b. Statement 1,3,5 are True and Statement 2,4 are False
c. Statement 1,2,5 are True and Statement 3,4 are False
d. All the statements are True

2) The ELF header does not contain the following
a. Type
b. Magic Number(Identification)
c. Section Header
d. Number of Section Headers

1M CO1

CHRUA

3) In a 32-bit system, we are debugging a program using gdb, and we run the following
command
$ x/32x $esp, what is the size of the memory displayed in bytes?
a. 1 byte
b. 128 bytes 1M CO1
c. 1024 bytes
d. 32 bytes

4) Suppose the above program is compiled as follows:
$ gcc prog.c –o prog
Which of the following statements will display the contents of executable sections?
a. objdump -d -Mintel prog
b. objdump --disassemble-all prog 1M CO1
c. objdump --disassemble prog.c
d. objdump -D prog

5) The ELF header does not contain the following
Type
Magic Number(Identification)
Section Header 1M CO1
Number of Section Headers

Q.2A) Solve - Objective type questions. (Difficulty Level – Moderate)

1) What does the authenticate function do?
a. Spawns a child, and the parent reads 100 bytes from stdin
b. Spawns a child, and the child reads 100 bytes from stdin
c. Spawns a child, and the child reads 256 bytes from stdin 1M CO2
d. Spawns a child, and the parent reads 256 bytes from stdin

2) The flag -fstack-protector is used to enable
a. Canaries
b. W^X
c. ASLR 1M CO2
d. None

3) This program is free from:
1. Buffer overflow attacks
2. Return2libc attacks
3. ROP attacks

a. Statement 1 and 2 are True and Statement 3 is False
b. Statement 1 and 3 are True and Statement 2 is False 1M CO2
c. Statement 2 and 3 are True and Statement 1 is False
d. All the Statements are False

GITRUA

4) Identify the protocol associated with the Heartbleed security vulnerability.
   a. HTTP
   b. Open SSL (SSL/TLS) 1M CO2
   c. SMTP
   d. SSH

5) The heart bleed attack could have been avoided if this condition was met
   a. Data Length = Payload Length
   b. Data Length <= Payload Length
   c. Data length >= Payload length 1M CO2
   d. None of the above

6) Which of these techniques is essential for achieving PIC?
   a. Using absolute addressing for all memory references.
   b. Employing relative addressing and indirect jumps. 1M CO2
   c. Avoiding any data access within the code.
   d. Storing all instructions in a separate memory segment.

Q.2B) Solve Any Four (Difficulty Level – High)

1) If the process shifted from memory block to another
   a. -execstack
   b. -fpic
   c -z execstack
   d. -fno-stack-protector 1M CO2

2) How can stack canaries (canary values) enhance security in the context of buffer overflow attacks?
   a. By encrypting the stack memory
   b. By monitoring network traffic
   c. By detecting buffer overflows through changes in the canary value 1M CO2
   d. By compressing the size of the buffer

3) What is the purpose of the Global Offset Table (GOT) in use-after-free attacks?
   a. To optimize code execution speed
   b. To enhance code readability
   c. To store pointers to global variables and functions
   d. To manipulate data in the heap 1M CO2

4) Read the following Solution and identify what problem it solves
   Solution: Lazy binding using PLT Problems.
   a. Faster run time access
   b. Load time relocation of global Data
   c. Saves space and time by loading only needed functions.
   d. To prevent ASLR from run-time attacks

1M CO2

GTIRUA

5) What is the primary purpose of Address Space Layout Randomization (ASLR) in web security?
a. To enhance code readability
b. To prevent buffer overflows
c. To manipulate data on the program heap
d. To randomize the memory addresses of key system components 1M CO2

Q.3A) **Solve - Objective type questions. (Difficulty Level – Moderate)**

1) In an allocated chunk, there are three flag bits. To check if the previous chunk is in use, you should check the _____ flag, and its value should be _____.
a. M,1
b. N,0
c. P,1
d. P,0 1M CO3

2) What term describes the memory allocated by the operating system in the heap, which is currently unallocated for data storage?
a. Free Chunk
b. Top Chunk
c. The last remaining chunk
d. None 1M CO3

3) Double-free vulnerability is dangerous because?
1. access invalid memory locations, leading to segmentation faults or undefined behavior.
2. allocate the same memory address twice, creating a buffer overflow opportunity for an attacker.
3. corrupt the memory management data structures, allowing an attacker to write values in arbitrary memory locations. 1M CO3
a. Statement 1 and 2 are True and Statement 3 is False
b. Statement 1 and 3 are True and Statement 2 is False
c. Statement 2 and 3 are True and Statement 1 is False
d. Statement 1,2 and 3 all are True

4) Which of the following is True/False for the Information flow policies
I. Information can flow from a lower class to a higher class only
II. Information flow policies are typically a replacement for DAC

a. Statement 1 and Statement 2 both are True
b. Statement 1 is False and Statement 2 is True
c. Statement 1 is True, Statement 2 is False
d. Statement 1 False, Statement 2 is False 1M CO3

CHRUA

5) Which of the following statements accurately describe the scenario within a Bell-La Padula model with four classes: Top Secret, Secret, Confidential, and Unclassified, considering Emily's access to confidential documents and James's access to secret information?

I. Under the no-read-up policy, James is unable to read files accessible to Emily.
II. James possesses the capability to grant Emily read access to a file he has authored. 1M CO3

a. Statement I is true, and statement II is true.
b. Statement I is true, and statement II is false.
c. Statement I is false, and statement II is false.
d. Statement I is false, and statement II is true

6) Where is the password of a user stored in an encrypted format
a. /etc/shadow
b. /etc/pwd 1M CO3
c. /etc/passwd
d. /etc/password

Q.3B) Solve Any Four (Difficulty Level – High)

1) Heap can be used as
a. Priority Queue
b. Stack
c. A decreasing order of Array 1M CO3
d. Normal Array

2) Which format specifier in the printf function of C poses a potential risk for arbitrary memory writes when exploited?
a. %p
b. %n
c. %o 1M CO3
d. %x

3) Identify whether the following statements are true or false regarding access control mechanisms in computer systems:
I. Hardware access control is facilitated by the Paging Unit.
II. Privilege rings and Virtual Boxes contribute to access control.

a. Statement I is True, statement II is True
b. Statement I True, statement II False 1M CO3
c. Statement I False, statement II is True
d. Statement I False, statement II is False

4) Suppose in a system, you have 2000 files and four users who have access rights to these files. Which of the following is the best method for implementing access control?
a. Using an access matrix
b. Any of the above techniques would work well
c. Using access control lists
d. Using a capability based implementation 1M CO3

5) In software fault isolation techniques, the virtual address space of a process is divided into multiple segments to ensure security. One such segment ranged from 0xFEEE0000H to 0xFEEEFFFFH. Which of the following instructions are used to access memory can be unsafe?

I. JMP *ebx
II. MOV r0, 0xFFEE1200H; Load [r0]
III. AND %ecx 0xFFEE1200H
IV. INT $0x80
V. MOV r1, 0xFEEE1200H; Load [r1]

CO3 1M

a. I, III, IV
b. I, III, VI, V
c. I, II, IV
d. All of them

Q.4A) Solve - Objective type questions. (Difficulty Level – Moderate)

1) What factors influence the propagation time of an electric signal through the arbiters in an arbiter PUF?

1. Number of Arbiters in the chain
2. The path taken by the electric signal
3. The delay in each arbiter

1M CO4

a. Statement and 1 and 2 are True 3 False
b. Statement and 2 and 3 are True 1 False
c. All the statements are True
d. All the statements are False

2) SGX enclaves run at ring _____?

a. 3
b. 2
c. 1
d. 0

1M CO4

3) What kind of applications are Weak Physical Unclonable Functions (PUFs) best suited for?

1 Applications requiring frequent key changes
2 Applications where a single secret key can be used repeatedly
3 Applications with complex encryption requirements
4 Applications with dynamic authentication needs

a. Both the statements 3 and 4 are correct
b. Statements 1, 2 and 3 are correct
c. Only statement 2 is correct
d. All are correct

1M CO4

GHRUA

4) Identify the attack described in the following statement:
A race condition occurs between memory access and privilege checking, allowing unauthorized access to restricted memory via a cache side channel.

1M CO4

1. Meltdown
2. Spector
3. Rowhammer

a. Only statement 1 is correct
b. Only statement 2 is correct
c. Both the statements 1 and 2 are correct
d. All of the above statements are correct

5) _____ attack is strong enough to give kernel access permissions to the user process.

1M CO4

1 Meltdown
2. Spectre
3. Rowhammer

a) Statement 1 and 3 are correct
b) Statement 2 and 3 are correct
c) Only statement 3 is correct
d) All the statement are correct

6) Consider a 4-way set-associative cache of total size 16 KB. The cache has a line size of 8 words, and each word is 4 bytes. If data is accessed at the address 0xdeadbeef, in which set of the cache will this address be located?

1M CO4

a. Set 74
b. Set 93
c. Set 101
d. Set 54

Q.4B) Solve Any Four (Difficulty Level – High)

1) Match the following in connection to SGX

I. PRM ----------Encryption
II. EPCM ----------Management related aspects for EPC
III. Secure output from processor--------Not accessible memory for non-trusted devices
IV. SECS----------Contains global metadata of enclave
V. EERESUME instruction----------Restores all the registers after an interrupt

1M CO4

a. Statement 1,4,5 are True and statement 2,3 are False
b. Statement 2,4,5 are True and statement 1,3 are False
c. Statement 1,2,5 are True and statement 3,4 are False
d. All the statements are True

GHRUA

2) A TLB in an ARM trust-zone has the following fields
a. NSTID bit + Virtual Address, NS bit + Physical Address
b. Virtual Address, Physical Address and the NS bit
c. NSTID bit, Virtual Address
d. NS bit, virtual address 1M CO4

3) What is the correct security-checking order for implementing a chain of trust?
1. Root of trust -> Secure OS -> Boot Loader -> Rich OS
2. Root of trust -> Boot Loader -> Secure OS -> Rich OS

a. Statement 1 is True and statement 2 is False 1M CO4
b. Statement 2 is True and statement 1 is False
c. Both Statements 1 and 2 are True
d. Both Statements 1 and 2 are False

4) Which of the following is true for out-of-order execution
I. Hardware required is complex
II. Hardware required is simple compared to in-order processors
III. Used to reduce latencies
IV. Exploits instruction level parallelism and hides latencies 1M CO4

a. I,III and IV
b. II and III
c. I, II, III
d. All of the above

5) Match the following, trying to relate an attack with a protection mechanism. 1M

1 Meltdown	Kernel Page Table Isolation
2 Specter	Fencing of Instructions
3 Cold Boot	Cache Partitioning
4 Prime +Probe	Memory Encryption
5 Row Hammer	Error Detection Codes in Memory

CO4

a) Statements 1,2 and 3 are correct
b) Statements 1,2 and 4 are correct
c) Statements 1,2 and 5 are correct
d) All the statements are correct

Q.5A) Solve - Objective type questions. (Difficulty Level – Moderate)

1) What are the possible means to achieve fault injection in a circuit?
a. Radiation
b. Clock glitch
c. Voltage Glitch

1M CO5

a. Statements 1 and 2 are correct
b. Statements 2 and 3 are correct
c. All the statements are correct
d. All the statements are incorrect

CHRUA

2) Let O and O' be the output of a main and redundant circuit used in redundancy-based countermeasures for fault attacks. Which of the following is true for the circuit to be not faulty

1 O xor O' = 1 1M CO5

2 O xor O' = 0

a. Only statement 2 is True
b. Only statement1 is True
c. Both statements are False
d. Both statements are True

3) Which of the following statements are true regarding power attacks on ciphers and related countermeasures?

1. Are there specialized libraries with cells or gates designed to ensure uniform power consumption across different operations?
2. Is DRECON an algorithmic approach to mitigate power attacks on ciphers? 1M CO5

a. Only statement1 is True and statement 2 is False
b. Only statement 2 is True and statement 2 is False
c. Both statements are False and statement 2 is False
d. Both statements are True and statement 2 is False

4) Which of the following statements is true about the Trojans?

a. Trojans perform tasks for which they are designed or programmed
b. Trojans replicates them self's or clone them self's through an infections
c. Trojans do nothing harmful to the user's computer systems 1M CO5
d. None of the above

5) State True/False

1.Programs that consume the same amount of power, independent of the input, can protect programs against power side-channel attacks.
2. The activation mechanisms for hardware Trojans are often based on internal signals that change state infrequently.

a. Statement 1 is True and Statement 2 is False 1M CO5
b. Statement 1 is False and Statement 2 is True
c. Both the Statements are True
d. Both the Statements are False

6) Which one of the following principles of cyber security refers that the security mechanism must be as small and simple as possible?

a. Open-Design
b. Fail-safe Default
c. Least privilege
d. Economy of the Mechanism

1M CO5

Q.5B) Solve Any Four (Difficulty Level – High)

1) Select the most appropriate option for the following statement.
   a. Power side-channel attack work based on the principle
   b. Power consumption fluctuates based on the data being processed. 1M CO5
   c. Power consumption is directly proportional to the duration of the operation.
   d. All of the above

2) What is a typical CMOS inverter made of PMOS and NMOS transistor
   1. Both are joined in series.
   2. Both are joined in parallel

   a. Both the statements are True 1M CO5
   b. Only statement 1 is True
   c. Only statement 2 is True
   d. Both the statements are False

3) Which of the following statements is correct about the firewall?
   a. It is a device installed at the boundary of a company to prevent unauthorized physical access.
   b. It is a device installed at the boundary of an incorporate to protect it against the unauthorized access. 1M CO5
   c. It is a kind of wall built to prevent files form damaging the corporate.
   d. None of the above.

4) Statue True/False
   1. Trojan creators do not look for Securing systems with such programs
   2. Trojans can only be inserted during the time of fabrication.

   1M CO5

   a. Statement 1 is True and Statement 2 is False
   b. Statement 1 is False and Statement 2 is True
   c. Both the Statements are True
   d. Both the Statements are False

5) State True/False
   1.The -1 value of Pearson's correlation coefficient means that the attacker's prediction is far from the actual key value.
   2. In Power Consumption models, the Hamiltonian Distance and Manhattan distance Models are commonly used. 1M CO5

   a. Statement 1 is True and Statement 2 is False
   b. Statement 1 is False and Statement 2 is True
   c. Both the Statements are True
   d. Both the Statements are False

CHRUA

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(SIX SEMESTER)

Course: Applied Life Skills for Progressive Excellence **Course Code: UHET301**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	The basic life skills towards self and Community as a whole and its varied approaches.
CO2.	The exposure to Self-awareness and face challenges based on life situations.
CO3	A better understanding of life skills with social-psychological and emotional foundations.
CO4.	Social responsibility and exhibit enhancement in their positive and healthy behaviour.
CO5.	A deep sense of active membership of their community and a lasting, positive impact on

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) A Write the answers of the following questions.

a) What is an Empathy? 1M CO1

b) What is self-awareness? 1M CO1

Q.1) B Give in detail the answers of the following questions. Solve Any Two

a) Describe self-esteem and why self-esteem is important? 4M CO1

b) Give the ideas for overcoming failure? 4M CO1

c) What is attitude and why attitude is important? 4M CO1

Q.2) A Write the answers of the following questions.

a) How you will react if someone is bullied by the people. 1M CO2

b) What is peer pressure? 1M CO2

Q.2) B Solve Any Two

a) If someone ask you to have drugs without your wish? how you are going to handle the situation. 4M CO2

b) How you can help your friend in fighting with his depression. 4M CO2

c) How can creative thinking help you in your practical life? 4M CO2

Q.3) A Write the answers of the following questions.

a) If really sadness leads to depression? 1M CO3

b) What is problem solving? 1M CO3

Q.3) B Give in detail the answers of the following questions. Solve Any Two

a) Explain the relation between risk and resilience with examples. 4M CO3

b) How we can deal with the criticism. Explain it with suitable example. 4M CO3

c) Explain the analytical skills in detail. 4M CO3

Q.4) A Write the answers of the following questions.

a) What is positive peer pressure? 1M CO4

b) What is depression? 1M CO4

Q.4) B Give in detail the answers of the following questions. Solve Any Two

a) What are the characteristics of emotions? 4M CO4

b) Give the difference between conscious and unconscious mind. 4M CO4

c) Give the types of decision making. 4M CO4

Q.5) A Write the answers of the following questions.

a) What is critical thinking? 1M CO5

b) What is social exclusion? 1M CO5

Q.5) B Give in detail the answers of the following questions. Solve Any Two

a) Why it is important to have social inclusion of women? 4M CO5

b) Give the importance of community service volunteering. 4M CO5

c) How small children and women fails victim to human trafficking? 4M CO5

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SCHOOL OF ENGINEERING & TECHNOLOGY

PRE-UNIVERSITY EXAMINATION (SUMMER 2024)

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

(SIXTH SEMESTER)

Course: MACHINE LEARNING ALGORITHMS **Course Code: UAIT206**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Understand modern notions in machine learning and computing.	
CO2.	Understand a wide variety of learning algorithms.	
CO3	Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own.	
CO4.	Evaluate Machine Learning Models generated from data.	
CO5.	Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.	

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1)				
	a)	What is meant by 'Test Set'?	1M	CO1
	b)	What is Bias in Machine Learning?	1M	CO1
Q.1)	Solve Any Two			
	a)	Explain supervised machine learning with the help of example.	4M	CO1
	b)	What is Cross-Validation? Explain any technique of Cross-Validation.	4M	CO1
	c)	How to construct a confusion matrix. How to compute the accuracy, precision and recall for the dataset.	4M	CO1
Q.2)				
	a)	The learner is trying to predict housing prices based on the size of each house. The variable "size" is _____ a) dependent variable b) label set variable c) independent variable d) target variable	1M	CO2
	b)	Decision Trees can be used for Classification Tasks. a) True b) False	1M	CO2
Q.2)	Solve Any Two			

		How to construct a decision tree. Explain with example.	4M	CO2
	b)	Discuss the concept of overfit, underfit and best fit.	4M	CO2
	c)	How a recommender system work? What are different types.	4M	CO2
Q.3)				
	a)	Define independent event.	1M	CO3
	b)	In context with SVM, the optimal classifier is the one with the largest margin. a) True b) False	1M	CO3
Q.3)	Solve Any Two			
	a)	Explain SVM Algorithm in Detail.	4M	CO3
	b)	Differentiate between logistic regression and SVM.	4M	CO3
	c)	Discuss conditional probability with the help of example.	4M	CO3
Q.4)				
	a)	The VC dimension is a measure of the complexity of a model. a) True b) False	1M	CO4
	b)	Which of the following is NOT an ensemble learning technique? a) Striking b) Bagging c) Boosting d) Stacking	1M	CO4
Q.4)	Solve Any Two			
	a)	Explain Ensemble learning.	4M	CO4
	b)	How to estimate sample complexity.	4M	CO4
	c)	What are the main goals of computational learning theory?	4M	CO4
Q.5)				
	a)	K-Means Clustering comes under a) Supervised learning Algorithm b) Unsupervised Learning Algorithm c) Reinforcement Learning d) None of the above	1M	CO5
	b)	Give two real-life examples of Gaussian mixture models.	1M	CO5
Q.5)	Solve Any Two			
	a)	What Are Unsupervised Machine Learning Techniques?	4M	CO5
	b)	What do you understand by hierarchical clustering? Discuss different types.	4M	CO5
	c)	What do you understand by Gaussian Mixture Model.	4M	CO5

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SCHOOL OF ENGINEERING & TECHNOLOGY

END SEMESTER EXAMINATION (SUMMER 2024)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE AND ENGINEERING

(SIX SEMESTER)

Course: MACHINE LEARNING ALGORITHM **Course Code: UAIT206**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Understand modern notions in machine learning and computing.
CO2.	Understand a wide variety of learning algorithms.
CO3	Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own.
CO4.	Evaluate Machine Learning Models generated from data.
CO5.	Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) A

a) Define Hypothesis. → Decision Boundry 1M CO1

b) What do you understand by 'Training set'? 1M CO1

Q.1) B Solve Any Two

a) Define machine learning. What are the different types of machine learning? 4M CO1

b) How to construct a confusion matrix. How to compute the accuracy, precision and recall for the dataset. 4M CO1

c) What is Bias in Machine Learning? Explain with example. 4M CO1

Q.2) A

a) Decision Tree is- 1M CO2
a) Supervised learning technique b) Unsupervised learning technique
c) Reinforcement learning technique d) Semi-Supervised learning technique

b) The learner is trying to predict housing prices based on the size of each house. The variable "size" is _____ 1M CO2
a) dependent variable b) label set variable
c) independent variable d) target variable

Q.2) B Solve Any Two

a) How to construct a decision tree. Explain with example. 4M CO2

		4M	CO2
b)	Discuss linear regression with an example.	4M	CO2
c)	What are the tasks of recommender systems.		

Q.3) A

a)	Which of the following is NOT a type of logistic regression? a) Binary logistic regression b) Multinomial logistic regression c) Ordinal logistic regression d) Multiordinal logistic regression	1M	CO3
b)	Define Conditional Probability. P(B|A) event B given event A	1M	CO3

Q.3) B Solve Any Two

a)	What are Support Vectors in SVM?	4M	CO3
b)	Explain Bayes Theorem with example.	4M	CO3
c)	Differentiate between logistic regression and SVM.	4M	CO3

Q.4) A

a)	Sample complexity determines the number of data samples required to achieve a certain level of learning performance. a) True b) False	1M	CO4
b)	Which of the following is NOT an ensemble learning technique? a) Striking b) Bagging c) Boosting d) Stacking	1M	CO4

Q.4) B Solve Any Two

a)	Discuss computational learning theory in ML. Give real-world applications.	4M	CO4
b)	Define VC dimension. Write advantages of VC dimension.	4M	CO4
c)	What is Ensemble learning?	4M	CO4

Q.5) A

a)	Which of the following clustering requires merging approach? a) Partitional b) Hierarchical c) Naive Bayes d) None of the mentioned	1M	CO5
b)	K-Means Clustering comes under a) Supervised learning Algorithm b) Unsupervised Learning Algorithm c) Reinforcement Learning d) None of the above	1M	CO5

Q.5) B Solve Any Two

a)	What do you understand by clustering? Discuss K-Means clustering algorithm.	4M	CO5
b)	What are the two different types of hierarchical clustering.	4M	CO5
c)	What do you understand by Gaussian Mixture Model.	4M	CO5

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END SEMESTER EXAMINATION (SUMMER 2024)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE AND ENGINEERING

(SIX SEMESTER)

Course: Unstructured Database Management **Course Code: UCST305**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	To Differentiate between a relational database and a non-relational (NoSQL) database
CO2.	To Perform CRUD operations (create, read, update and delete) on data in NoSQL environment
CO3	To Define, compare and use the four types of NoSQL Databases Outcomes. (Document-oriented, Key Value Pairs, Column-oriented and Graph).
CO4.	To Demonstrate an understanding of the detailed architecture, define objects, load data, query data and performance tune Column-oriented NoSQL databases.'
CO5.	To implement the advanced unstructured database management techniques

Instructions to Candidates:
1. All questions are compulsory
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) A

a) Which of the following is not a NoSQL database? 1M CO1
a) MongoDB. b) Cassandra
c) MySql. d) Riak.

b) Which of the following is not a property of RDBMS? 1M CO1
a) Consistency. b) Atomicity.
c) Schema less. d) Concurrency.

Q.1) B Solve Any Two

a) Explain impedance mismatch with a neat diagram. 4M CO1

b) What is NoSQL Database? Explain different types of NoSQL Database in detail. 4M CO1

c) Write short note on attack of the clusters. 4M CO1

Q.2) A

a) What is Single Server distribution model? 1M CO2

b) What is HBase? 1M CO2

Q.2) B Solve Any Two

a) Differentiate between NOSQL and Relational based database system. 4M CO2

b) What Master-Slave Replication? Explain with the help of diagram. 4M CO2

c) Describe Aggregate Data Models. 4M CO2

Q.3) A

a) What is a Document Database? 1M CO3

b) Define MongoDB. 1M CO3

Q.3) B Solve Any Two

a) Write queries for following operations in MongoDB 4M CO3

i) Create a database

ii) Create collection

iii) Insert data

iv) Retrieve data

b) Explain features of document based database 4M CO3

c) Write short note on E-commerce applications. 4M CO3

Q.4) A

a) List different types of Column-Family databases. 1M CO4

b) What is Bigdata? 1M CO4

Q.4) B Solve Any Two

a) Explain use cases for Column-Family database. 4M CO4

b) Explain different features of Column-Family database. 4M CO4

c) Write queries for commands CREATE, ALTER, DROP and INSERT using Cassandra Query Language. 4M CO4

Q.5) A

a) Riak is key value pair database. (True/False) 1M CO5

b) List use cases when Key-Value Store database is not preferable. 1M CO5

Q.5) B Solve Any Two

a) Differentiate between Key-Value Store and Column Family based database. 4M CO5

b) What are Key Value Stores? List out some popular key value database. Explain how all the data is stored in a single bucket of key value data store. 4M CO5

c) List and Explain different types of use cases for Key-Value Store database. 4M CO5

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END SEMESTER EXAMINATION (SUMMER 2024)

BACHELOR OF TECHNOLOGY IN
COMPUTER SCIENCE AND ENGINEERING

(SIXTH SEMESTER)

Course: SOFTWARE TESTING **Course Code: UCST304**
Time: 2:30Hrs **Max. Marks: 50**

Course Outcomes (CO):
Upon completion of the course, students will be able to

CO1.	Identify bugs to create defect report of a given application.
CO2.	Summarize test cases for different types and levels of testing.
CO3	Illustrate test plan for an application.
CO4.	Develop and validate a test plan.
CO5.	Analyze software using automated testing tools

Instructions to Candidates:
1. All questions are compulsory.
2. Assume suitable data wherever necessary
3. Illustrate your answer with the help of neat figures.

Q.1) A

a) Which term is used to define testing? 1M CO1
a) Evaluating deliverables to find errors b) Finding broken code
c) A stage of all projects d) None of the above

b) The "V" model is? 1M CO1
a) Test type b) Test Level
c) Test design technique d) Software development testing (SDLC) model

Q.1) B Solve Any Two

a) Explain the Tester's Role in a Software Development Organization. 4M CO1

b) Elaborate Testing Maturity Model (TMM) Levels in detail. 4M CO1

c) Explore Defect classes and the defect repository with a diagram. 4M CO1

Q.2) A

a) Which of the following testing is related to the boundary value analysis? 1M CO2
a) White box and black box testing b) White-box testing
c) Black box testing d) None of the above

b) Functional testing is a ------ 1M CO2
a) Test design technique b) Test level
c) SDLC Model d) Test type

Q.2) B Solve Any Two

a) List out the different methods for Black-box Testing and explain any two of them. 4M CO2

b) Define code functional testing and control flow graphs. 4M CO2

c) Short note on test adequacy criteria. 4M CO2

Q.3) A

a) Which of the below testing is related to Non-functional testing? 1M CO3

a) Unit Testing b) Black-box Testing

c) Performance Testing d) None of the above

b) The Regression test case is not a --------? 1M CO3

a) Tests that focus on the software components, which have been modified.

b) Low-level components are combined into clusters, which perform a specific software sub-function.

c) Additional tests that emphasize software functions, which are likely to be affected by the change.

d) A representative sample of tests, which will exercise all software functions.

Q.3) B Solve Any Two

a) What are the different levels of testing? Explain OOP based system with a diagram. 4M CO3

b) Explain integration testing with integration test planning. 4M CO3

c) Write note on performance testing. 4M CO3

Q.4) A

a) What is the main task of test planning? 1M CO4

a) Measuring and analysing results b) Evaluating exit criteria and reporting

c) Determining the test approach d) Preparing the test specification

b) As part of which test process do you determine the exit criteria? 1M CO4

a) Test Planning b) Evaluating exit criteria and reporting

c) Test closure d) Test control

Q.4) B Solve Any Two

a) Explain the major activities required for building a test group. 4M CO4

b) Draw the diagram for the relationship between test-related documents and elaborate on it. 4M CO4

c) Explain the different responsibilities of the test manager. 4M CO4

Q.5) A

a) Which one of the following is not an automation testing framework/tool? 1M CO5

a) Angular b) Cypress c) Selenium d) Protractor

b) Which of these provides functional and regression test automation for software applications and environments? 1M CO5

a) QTP b) Selenium c) QA Programming d) Testing fundamental

Q.5) B Solve Any Two

a) Explain the different automated testing processes. 4M CO5

b) Illustrate the Selenium Tool suite in detail. 4M CO5

c) What is test automation? Which skills are needed for test automation? 4M CO5

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