B.S. Abdur Rahman Crescent Institute of Science & Technology

CSD 3101

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CONTINUOUS ASSESSMENT TEST- 2 OCTOBER 2023

Programme & Branch	:	B.Tech CSE & CSE(CS),CSE(IoT)			
Semester	:	V	Date & Session	:	12/10/2023 AN
Course Code & Name	:	CSD 3101 & Theory of Computation			
Duration	:	90 minutes	Maximum Marks	:	50

ANSWER ALL QUESTIONS

PART A (5 X 2 = 10 MARKS)

1. Define regular expression.
2. List any two methods to convert finite automata to regular expression.
3. State kleene closure and positive closure of a language L.
4. What are the uses of context free grammar?
5. Write the context free grammar for the language
   $L = \{ a^n b^n \mid n \geq 1 \}$

PART B (2 X 16 = 32 MARKS)

6 a (i) Construct NFA equivalent to the regular expression ((0+1)(0+1)(0+1)*)* by using Thompson's construction rule. **(16)**

(OR)

b (i) Explain and prove pumping lemma for regular sets. **(8)**

(ii) Discuss the closure properties of regular languages. **(8)**

7 a (i) Draw the derivation tree for the string w = abbbab from the grammar G= ({S,A},{a,b},P,S) where P consists of
S → aAS | b
A → SbA | ba **(8)**

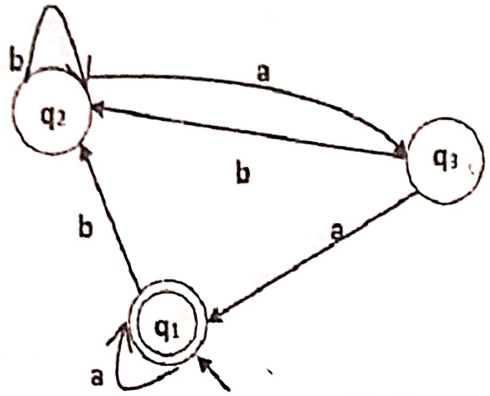
(ii) Prove that the following grammars are ambiguous or not for the string w= aab
S → AB | aaB
S → AB
S → AaB
S → AaaB
A → a | Aa
B → b **(8)**

(OR)

b (i) Convert the following grammer into Chomsky normal form
S → cBA | A
A → cB | AbbS
B → aaa (16)

PART C (1 X 8 = 8 MARKS)

8.a (i) Construct a regular expression corresponding to the automata given below (Using Arden's theorem).



(8)

(OR)

b. (i) Construct the Greiback normal form equivalent to the grammar
S → AA | 0
A→ SS | 1 (8)

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CSD 3102

RRN | 2 | 1 | 9 | 1 | 6 | 0 | 1 | 0 | 0 | 2 |

CONTINUOUS ASSESSMENT TEST- 2 OCTOBER 2023

Programme & Branch	:	B.Tech CSE,CSE(IoT) & CSE(CS)		
Semester	:	V	Date & Session	: 13.10.2023 & AN
Course Code & Name	:	CSD 3102 & Artificial Intelligence Techniques		
Duration	:	90 minutes	Maximum Marks	: 50

ANSWER ALL QUESTIONS

PART A (5 X 2 = 10 MARKS)

1. Differentiate between Forward and Backward reasoning.
2. Write the generalized Modus Ponens Rule.
3. State the functions of planning systems.
4. Mention the guidelines to be considered while planning for knowledge acquisition.
5. Define the term utility in game theory.

PART B (2 X 16 = 32 MARKS)

6.a (i) Discuss unification algorithm used for reasoning under predicate logic with an example (10)

(ii) Find the most general unifier for (6)

- {p(b, X, f(g(Z)) and p(Z, f(Y), f(Y))}
- {P(a, g(x, a), f(y)), P(a, g(f(b), a), x)}

(OR)

b (i) Explain the concept of resolution. (6)

(ii) Consider the following sentences

- John likes all kinds of food.
- Apples are food.
- Anything anyone can eat and its not killed by food.
- Bill eats food peanuts and is still alive.
- Sue eats everything Bill eats. (10)

Represent these sentence into formulae in predicate logic, convert into clausal form and prove that John likes peanuts using resolution.

7.a (i) Explain about STRIPS and write the components of STRIPS for the given scenario: "Consider a flight journey in a luxurious flight from India to US" (16)

(OR)

b (i) Elucidate about partial order planning method with an example. (8)

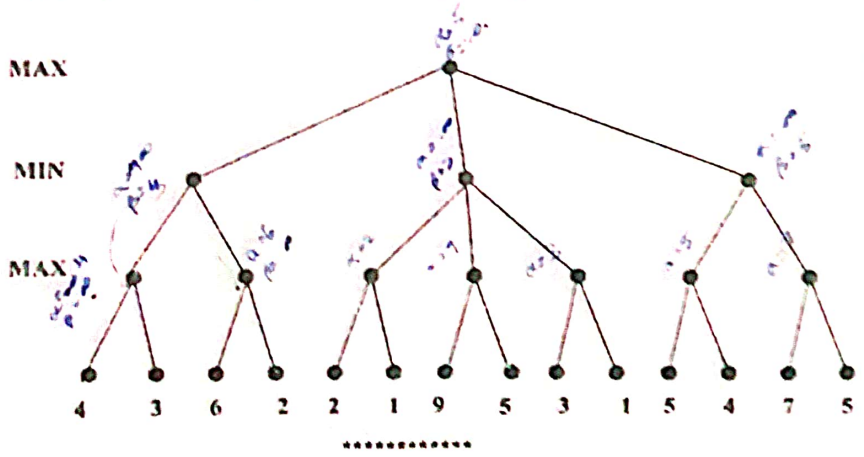
(ii) Justify- " Planning in artificial intelligence is about decision making". (8)

PART C (1 X 8 = 8 MARKS)

8.a Assume a static evaluation function that returns values ranging from -10 to 10, with 10 indicating a win for the first player and -10 a win for the second player. Apply min-max procedure to compute best move for the first player. (8)

(OR)

b. Apply Alpha Beta algorithm for the given game tree.



(8)

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CSD 3141

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CONTINUOUS ASSESSMENT TEST- 2 OCTOBER 2023

Programme & Branch	:	B.Tech CSE(IoT)		
Semester	:	V	Date & Session	: 14/10/2023 AN
Course Code & Name	:	CSD 3141 & IoT Architecture and Protocols		
Duration	:	90 minutes	Maximum Marks	: 50

ANSWER ALL QUESTIONS

PART A (5 X 2 = 10 MARKS)

1. Distinguish between IEEE 802.11 and IEEE 802.15 wireless communication standards.
2. Define Wireless HART.
3. What is the purpose of the PHY/MAC layer in wireless communication?
4. Name two commonly used Arduino libraries and their purpose.
5. Mention the role of the setup() and loop() functions in Arduino programming.

PART B (2 X 16 = 32 MARKS)

6 a	(i)	Compare and contrast the network layer protocols IPv4 and IPv6.	(8)
	(ii)	Elaborate the significance of 6LoWPAN and 6TiSCH in IoT networking.	(8)
		(OR)	
b	(i)	Summarize the role of RPL (Routing Protocol for Low-Power and Lossy Networks) in IoT networks.	(8)
	(ii)	Discuss the security challenges in IoT protocols and how they can be mitigated.	(8)

CSD 3141

7 a (i) Explain the components of the Arduino UNO architecture with a neat diagram. (16)

(OR)

b (i) Describe the procedure for interfacing a push button with an Arduino UNO. Provide a complete circuit diagram and code. (16)

PART C (1 X 8 = 8 MARKS)

8 a Design a two way traffic signal to blink LED's in the Arduino UNO Board using an embedded C. (8)

(OR)

b Walk through the process of interfacing a buzzer with an Arduino UNO and create different tones or melodies using embedded C. (8)

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CONTINUOUS ASSESSMENT TEST- 2 OCTOBER 2023

Programme & Branch	:	B.Tech CSE (IoT)			
Semester	:	V	Date & Session	:	17/10/2023 & AN
Course Code & Name	:	CSDX 352 & Wearable Computing			
Duration	:	90 minutes	Maximum Marks	:	50

ANSWER ALL QUESTIONS

PART A (5 X 2 = 10 MARKS)

1. Which IoT protocol is based on Publish – Subscribe scheme?
2. Define prototyping.
3. What is a sensor stream?
4. Draw the architecture of Body Sensor Network (BSN).
5. State the constraints on power requirements for wearable devices.

PART B (2 X 16 = 32 MARKS)

6.a (i) Describe any two application layer protocols. **(12)**

(ii) Justify why it is better to use 6LoWPAN-UDP-CoAP stack in IoT instead of a stack of IPv6-TCP-HTTP. **(4)**

(OR)

b (i) Illustrate the working of BodyCloud with a neat architecture diagram. **(16)**

7.a (i) Elucidate the product development process with a neat sketch. **(16)**

(OR)

b (i) Discuss the open issues and challenges in building practical systems based on networks of body sensors. **(16)**

PART C (1 X 8 = 8 MARKS)

8.a Create a one page scenario where drivers and/or pedestrians could benefit from Internet of vehicles. (8)

(OR)

b. Analyse the possible design considerations that are appropriate for a smart T shirt that measures heart rate, breathing rate, and temperature. (8)

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CSDX 104

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CONTINUOUS ASSESSMENT TEST- 2 OCTOBER 2023

Programme & Branch	: B.Tech CSE, CSE (IoT). CSE (CS)		
Semester	: V	Date & Session	: 19/10/2023 & AN
Course Code & Name	: CSDX 104 & VIRTUALIZATION TECHNIQUES		
Duration	: 90 minutes	Maximum Marks	: 50

ANSWER ALL QUESTIONS

PART A (5 X 2 = 10 MARKS)

1. List any four benefits of P2V conversion.
2. What is cold cloning in virtual machine?
3. How to calculate the memory overhead in memory virtualization?
4. Define SAN.
5. Differentiate between SAN and NAS.

PART B (2 X 16 = 32 MARKS)

6.a (i) Explain hyper threading in virtualization. (8)

(ii) Enlist the benefits of Memory Virtualization. (8)

(OR)

b (i) Describe the calculation of memory overhead and memory optimization in detail. (16)

7.a (i) Elaborate the storage virtualization and its types with neat diagrams. (16)

(OR)

b (i) Explain tuning procedures for network virtualization with neat diagrams. (16)

PART C (1 X 8 = 8 MARKS)

8.a	(i)	Elaborate the process for CPU virtualization, and write the procedures for CPU tuning mechanism.	(8)

(OR)

b	(i)	Demonstrate the procedures for deploying applications in a virtual environment and how problems are handled while performing deployment.	(8)

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