ADAMAS UNIVERSITY
END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: **M. Tech** Semester: **II**
Stream: **CSE**
PAPER TITLE: **Parallel & Distributed Computing** PAPER CODE: **ECS61102**
Maximum Marks: **40** Time duration: **3 Hours**
Total No of questions: **08** Total No of Pages: **01**

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.

Instruction to the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a) "A Distributed system is a combination of many devices."** How these devices interact with each other?
b) Discuss about tightly coupled system?
c) Why Diskless workstations are preferred to diskful workstations?
d) "You access google.com but you do not know the exact physical address where the server is kept geographically."- What can be exact term of transparency over here?
e) What are the differences between a local call and a remote call?

GROUP –B
(Short Answer Type Questions)

Answer *any three* of the following $3 \times 5 = 15$

2. Describe about different Distributed computing system models? What is loosely coupled system? 4+1=5
3. To design a distributed system what are the important features to be considered? 5
4. Discuss about the fault tolerance system of a Distributed System? 5
5. What are the parameters for improving the performance of a distributed system? 5

GROUP –C
(Long Answer Type Questions)

Answer *any two* of the following $2 \times 10 = 20$

6. Discuss about the different types of server management of RPC devices? 10
7. Discuss about different stages of communication protocol of RPC with diagram? Discuss about different types of RPC operations? 5+5=10
8. Discuss about the importance of the reliability property of a distributed system? How does a client locate a server? 5+5=10

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: M. Tech
Stream: CSE
PAPER TITLE: Cloud Computing
Maximum Marks: 40
Total No of questions: 09

Semester: II

PAPER CODE: ECS61106
Time duration: 3 Hours
Total No of Pages: 01

Instruction to the Candidate:
1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1) **a)** Which cloud service is known as Hardware- as-a-Service also?
b) What is meant by that "Cloud" in cloud computing?

c) Which security policy demands special attention in cloud computing?

d) What is Open-source cloud computing PaaS facility originally developed by VMW?

e) Justify the meaning of this sentence **"**The idea of cloud computing is entire new and surfaced at the beginning of the current century".

GROUP –B
(Short Answer Type Questions)

Answer *any three* of the following $3 \times 5 = 15$

2) When does it become necessary to implement emulation-based virtualization?
3) Why the operating system-level virtualization is useful?
4) Describe PaaS-IaaS integration with a diagram.
5) What is virtualization? Explain with a diagram.
6) Describe SaaS-PaaS integration with a diagram.

GROUP –C
(Long Answer Type Questions)

Answer *any two* of the following $2 \times 10 = 20$

7) Explain different implementation levels of virtualization in cloud computing in detail with a diagram
8) Describe hosted approach in sever virtualization with a diagram. What are benefits and drawbacks of the hosted approach?
9) Draw the figure of cloud service models and corresponding security measures.

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: M.TECH/MCA
Stream: CSE
PAPER TITLE: Computational Complexity
Maximum Marks: 40
Total No of questions: 08

Semester: II
PAPER CODE: ECS61116
Time duration: 3 hours
Total No of Pages: 02

Instruction for the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** What is the dimension of time complexity for the following code:

```
for(i=2;i<n;i=i*2)
statement;
```

for sufficiently large n.

b) Which class of problems/questions are known as class-NP problems/questions?

c) What does it mean when we say that an algorithm X is asymptotically more efficient than Y?

d) What is the time complexity of the following code:

```
def f():
int a[N + 1][M + 1][K + 1]
sum = 0
for i = 1 to N:
        for j = i to M:
                for k = j to K:
                        sum += a[i][j]
print(sum)
```

e) An algorithm with time complexity O(f(n)) and processing time T(n) = cf(n), where f(n) is a known function of n, spends 10 seconds to process 1000 data items. How much time will be spent to process 100,000 data items if f(n) = n and f(n) = n 3 ?

GROUP –B

(Short Answer Type Questions)

Answer *any three* of the following $3 \times 5 = 15$

2. Discuss the **Bounded-Error Probabilistic Polynomial time** (**BPP**).

3. Prove that the Halting Problem of Turing Machine is Undecidable.

4. Describe what is Turing Machine and how is it differing from Finite Automaton and Pushdown Automaton.

5. Define Undecidability with a suitable example. What are the factors that makes an algorithm non-deterministic?

GROUP –C
(**Long Answer Type Questions**)

Answer *any two* of the following $2 \times 10 = 20$

6. Prove that CSAT (Circuit Satisfiability) is NP-Complete.

7. Show that 2SAT is in P but 3SAT is NP-Complete.

8. Prove that SAT (Satisfiability) is NP-Complete. Sate Cook's Theorem.

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: M. Tech Semester: II
Stream: CSE
PAPER TITLE: Principles of Programming Language (Elective –IV) PAPER CODE: ECS61120
Maximum Marks: 40 Time duration: 3 hours
Total No of questions: 09 Total No of Pages: 02

Instruction for the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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Answer all the Groups

Group A

Answer all the questions of the following **5 × 1 = 5**

1. A. Define Abstract Machine.
B. Define Context Free Grammar.
C. What is Parse tree?
D. What is the production form of Context-sensitive grammar?
E. What is Principle of Programming Language?

GROUP –B

(Short Answer Type Questions)

Answer *any three* of the following **3 × 5 = 15**

2. What is Ambiguous Grammar? Check the ambiguity of following grammar

$$S \rightarrow A / B$$
$$A \rightarrow aAb / ab$$
$$B \rightarrow abB / \in$$

3. Write down the algorithm to find the FOLLOW set() of any terminal symbol.

4. What do you understand Semantic and Syntax of programming language.

5. Difference between Subtype and Inheritance.

GROUP –C
(**Long Answer Type Questions**)

Answer *any two* of the following **2 × 10 = 20**

6. A. Write down the characteristics of a Good Programming Language. **5**

B. Write down the algorithm of Evolution by Value strategies. **5**

7. A. Find the FIRST () and FOLLOW () set of the following grammar **4+4 =8**

E-> TE'

E'->+TE' / ε

T-> FT'

T'-> (*FT')

F-> id / (E)

B. Draw the expression tree for scheme expression (* (+ 2 3) (+ 4 5)) **2**

8. For the following statement of a programming language discuss various types of bindings and the time when these bindings are done **10**

X= X+ 20

9. A. Define – call-by-reference and call-by-value-result. **2+2=4**

B. Explain the difference between call-by-reference and call-by-value-result with a suitable example. **6**

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END-SEMESTER EXAMINATION: JULY 2020

Name of the Program: B. Tech/M.Tech
Stream: ECE, CSE/CSE
PAPER TITLE: Internet of Things (IoT)
Maximum Marks: 40
Total No of questions: 08

Semester: VIII/II
PAPER CODE: EEC61128
Time duration: 3 hours
Total No of Pages: 02

Instruction for the Candidate:

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** Enlist four characteristics of IoT devices.
b) Explain Moore's Law in brief.
c) Explain the difference between a smart device and an intelligent device with suitable example.
d) Mention the names of three data protocols used in IoT.
e) Write down the full form of CIA Triad in context of Cybersecurity requirements.

GROUP –B
(Short Answer Type Questions)
Answer *any three* of the following $3 \times 5 = 15$

2. a) What is SMQTT? Explain the four main stages of SMQTT algorithm. Also mention few applications of SMQTT.
b) Explain why a single networking platform is generally not enough for an IoT device? [4+1]

3. a) Compare CISC based processors to RISC based processors in a tabular form.
b) Explain RSB arithmetic operation with the help of suitable diagram. [2.5+2.5]

4. a) Enlist the 9 frame types used in AMQP protocol and explain their significance in brief.
b) Mention the setup requirements for Raspberry Pi. [3+2]

5. a) Which two protocols are used for routing between PAN and IPv6 in 6LoWPAN?
b) Compare MQTT and CoAP protocols in tabular form. [2+3]

GROUP –C
(Long Answer Type Questions)
Answer *any two* of the following $2 \times 10 = 20$

6. a) Write a sample program (Pseudocode) in assembly language to read a data from an input port (IN), then add this value with the content of register E and multiply with a constant value (10) and send the computed data to an output port.
b) Explain the significance of the following Arduino functions: i) Delay () ii) pinMode (). Name the data types supported by Arduino. [5+5]

7. a) Explain the two topologies (Piconet and Scatternet) for Bluetooth with suitable diagrams.
b) Explain in your own words the meaning of the terms i) Interoperability ii) Heterogeneity in context of IoT environment. [5+5]

8. a) Explain the following topologies with the aid of suitable diagrams: i) Star topology ii) Mesh Topology. Also discuss their advantages and disadvantages in your own words.
b) Explain Public cloud, Private cloud and Hybrid Cloud deployment models with their advantages. [4+6]