SYBSc CS
3/4/23

IV 23040304M

**Time: 2Hr 30Mins** **Marks: 75**

**Note:1)All Questions are compulsory.**

**2)Figures to the right indicate full marks.**

**3)Assume necessary data as required.**

**Q-1) Attempt <u>any four</u> of the following.** **20**

A What is finite automata? Briefly explain with suitable example the acceptability of a string by a finite automaton.

B Compare between Mealy & Moore models.

C Construct DFA accepting all strings w over {a,b} such that the number of a's in w is 3 mod 4.

D Compare between DFA & NDFA. Give suitable examples.

E Write a note on operations on Languages.

F Construct DFA which accept a language of all strings starting with 'a' & ending with 'b'.

**Q-2) Attempt <u>any four</u> of the following.** **20**

A State & prove pumping lemma for regular sets.

B Explain the steps for reduction of grammar to Chomsky normal form.

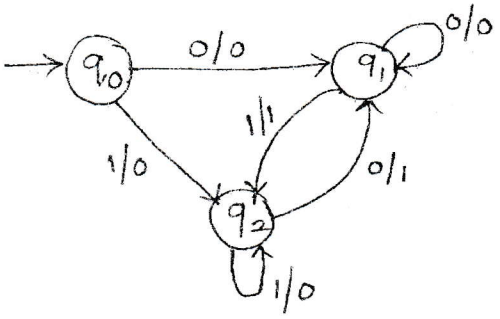
C What is a derivation tree? Generate the derivation tree for the string aabaa using the grammar G with following set of productions

$S \rightarrow aAS \mid a \mid SS$

$A \rightarrow SbA \mid ba$

P.T.O.

D Convert following Mealy machine to Moore Machine.




E Draw the transition diagram for the expression i)$a^*+ba^*$ ii)$a^*b+ba^*$

F Explain with suitable example the leftmost derivation & rightmost derivation.

**Q-3) Attempt <u>any four</u> of the following.** **20**

A Design a Turing Machine that accepts $\{0^n 1^n \mid n>=1\}$

B What is Turing Machine? Design a Turing Machine which can accept languages $0^*$, $1^*$.

C Explain the Linear Bound Automata Model.

D Write a note on Church Turing Thesis.

E Define Push Down Automata. Write components of PDA.

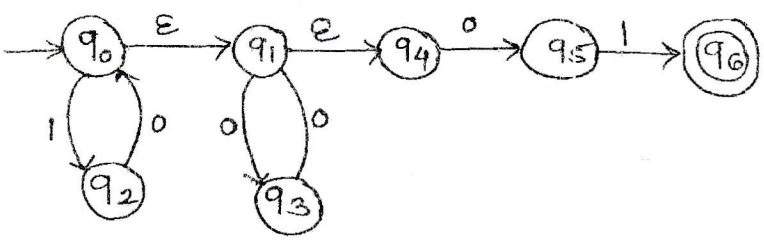
F Write short note on Recursive Enumerable Language.

**Q-4) Attempt <u>any five</u> of the following.** **15**

A Define : Regular Language, Regular set, Grammar

B Write applications of Finite State Automata.

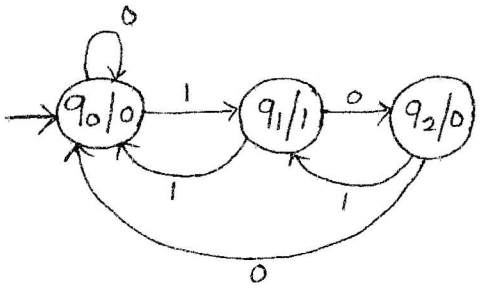
C Draw transition diagram after elimination of ε moves.



**D** Write regular expression for given language: set of all strings of 0's & 1's ending in 00.

**E** Construct NFA that accepts set of all strings over {0,1} of length 2.

**F** Convert following Moore machine to Mealy Machine.

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S4 BSc CS
11/4/23

IV 23041144M

**Time: -2 hr. 30 min.** **Marks: -75**

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**N.B.** **1) All questions shall be compulsory with internal choice within the questions.**
**2) Figures to the right indicate marks.**
**3) Illustrations, in-depth answers and diagrams will be appreciated.**
**4) Mixing of sub-questions is not allowed.**

**Q1** **Attempt any four.** **20**

a) Explain with a suitable example anatomy of Node.js application.
b) What is package.json file? Explain in details.
c) Which are the steps to creating an HTTP web server with Node.js? Explain
d) Elaborate findOneAndUpdate and create function in MongoDB.
e) Discuss the Mongo shell interface and MongoDB Compass.
f) Why uses Node,js? How does Node.js work?

**Q2** **Attempt any four.** **20**

a) Demonstrate implementation of HTTP and HTTPS servers using express.
b) How to apply route parameter using query string and regex? Explain.
c) Demonstrate simple EJS template for displaying a user.
d) How to implement two-way binding in angular? Explain.
e) Demonstrate the web application that print "Hello Word!" message using angular components.
f) How to use NgForOf and NgIFdirectives in angular? Explain.

**Q3** **Attempt any four.** **20**

a) What is flutter? List any four advantages of the flutter.
b) List and explain steps to install and configure the flutter SDK with Android studio.
c) Illustrate flow statements (such as for and while loop) working in dart. Explain.
d) Write a note on Container and Navigator widget.
e) Explain the Stateful and Stateless widget lifecycle.
f) How to use the top-level main() function? How to reference variables such as numbers, strings, Booleans, lists?

**Q4** **Attempt any five.** **15**

a) What is event loop in Node.js?
b) Write a note on findOneAndDelete function?
c) How to input data to another directive in angular?
d) List and describe any two build-in middleware components that come with express.
e) How to declare variable in dart? List datatype.
f) Write a short note on Scaffold widget and Image widget

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SYBS
10/4/23

W2304 1034 M

**Time : 2.5 Hrs.** **Marks:75**

**N.B.** **1) All questions are compulsory .**

**2) Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q1** | | **Attempt any Four.** | 20 |
| | A | State and explain features of android. | |
| | B | Explain android architecture with the help of diagram. | |
| | C | Explain application components in detail. | |
| | D | Explain classes in kotlin with example. | |
| | E | Write a note on anonymous function. | |
| | F | Briefly explain coroutines of kotlin. | |
| **Q2** | | **Attempt any Four.** | 20 |
| | A | Explain layouts and its types in detail. | |
| | B | What is the purpose of TextView? Explain the following attributes of TextView control:<br>1. Id<br>2. textColor<br>3. text<br>4. textStyle | |
| | C | Write a note on the imageview control. Give suitable example. | |
| | D | What is the purpose of menu? Explain context menu with suitable example. | |
| | E | Write a note on screen navigation. | |
| | F | What is a recyclerview? Explain with example. | |
| **Q3** | | **Attempt any Four.** | 20 |
| | A | What are Services in android? Give suitable example where Services can be used. | |
| | B | What is a Broadcast Receiver in android? Explain | |
| | C | Write a note on Drawables in android. | |
| | D | Explain lifecycle of services in android. | |
| | E | Write a note on animation in android. | |
| | F | Briefly explain the concept of async task. | |
| **Q4** | | **Attempt any Five.** | 15 |
| | A | Explain how intent can be used in android application. | |
| | B | State and explain various features of SQLite database. | |
| | C | What is the purpose of spinner? | |
| | D | Write a note on screen orientation. | |
| | E | Explain how intent can be used in android application. | |
| | F | Write a note on job scheduler. | |

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54 CS
8/4/23

IV 23040826 M

**Time:2½ hrs** **Full marks: 75**

**N.B. 1) All questions are compulsory.**
**2) Figures to the right indicate full marks.**

**Q1 Attempt the following (Any Four)** **20**

a) State the difference between IoT and M2M.
b) Explain IoT communication model.
c) What are the IoT enabling technologies?
d) What are the characteristics of IoT?
e) Write a short note on AMD Accelerated Processing Unit (APU).
f) What are the four layers of IoT architecture?

**Q2 Attempt the following (Any Four)** **20**

a) What is the role of CoAP protocol in IoT?
b) What are the features of GPIO?
c) Explain controlling LED with Raspberry pi.
d) Write a short note on basic hardware component of IoT.
e) Explain XMPP protocol
f) How camera can be interfaced with raspberry pi?

**Q3 Attempt the following (Any Four)** **20**

a) What are the advantages of Edge computing in IoT?
b) What is WSN in IoT? Write applications of IoT.
c) How IoT applications are used in Transportation?
d) Write a note on WSN architecture.
e) What is the difference between Fog and Edge computing?
f) How IoT applications are used in Health care?

**Q4 Attempt the following (Any Five)** **15**

a) What is SoC?
b) What is IoT
c) Explain the following terms
i) UART
ii) SPI
iii) GPIO
d) What is Fog computing?
e) Explain Pulse width modulation
f) What is the role of ARM8 in IoT?

SYBSC CS
6/4/23

IV 23040619M

[2 ½ hours] [Marks:75]

1. All Questions are compulsory.
2. Figures to the right indicate marks.
3. Illustrations, in-depth answers and diagrams will be appreciated.
4. Mixing of sub-questions is not allowed.

**Q1. Attempt any four** **(20)**

a) State and explain the key activities of XP Process.
b) Write a short note on Waterfall model.
c) Illustrate various types of relationships handled in class diagram with help of an example.
d) Deserибe the five levels of CMM in brief.
e) List and explain the five activities in process framework.
f) Define SRS. State the characteristics of SRS.

**Q2. Attempt any four** **(20)**

a) Define Cohesion. State and explain any four types of Cohesion.
b) Write a short note on COCOMO II model.
c) Demonstrate the need for Time-line charts.
d) What is Project Scheduling?Elaborate.
e) Differentiate between function oriented design and object oriented design.
f) Explain the steps involved in resource estimation.

**Q3. Attempt any four** **(20)**

a) Compare and contrast Verification and Validation.
b) State and explain any five McCall's Quality Factors.
c) Comment on RMMM plan in detail.
d) List the advantages and disadvantages of Structural testing.
e) Differentiate between Black-box and White-Box testing.
f) Elaborate on the phases of SCM process.

**Q4. Attempt any five** **(15)**

a) Write a short note on the layered technology of software engineering.
b) Define the following terms:
   i. bugs ii. faults iii. errors
c) What is Modularity? Elaborate.
d) Differentiate between alpha and beta testing.
e) Explain in brief the working of prototyping model.
f) Discuss the techniques for requirements gathering.

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IV 23040512 M

SYBSC CS
5/4/23

Time: 2 Hr. 30 Minutes

Max. Marks: 75

Notes
1) All questions are compulsory.
2) Figures to right indicate full marks.
3) Assume necessary data as required.

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|---|---|---|---|
| Que 1 | | **Attempt any Four of the following.** | 20 |
| | A | Explain the types of transmission modes. | |
| | B | What are the different types of networks? Explain in detail. | |
| | C | Describe the OSI reference model with neat diagram. | |
| | D | Illustrate the coaxial cable. | |
| | E | Write short note on circuit switching. | |
| | F | Explain AM in detail. | |
| Que 2 | | **Attempt any Four of the following.** | 20 |
| | A | What is an error? Explain the types of errors? | |
| | B | Explain the protocols in Data link layer. | |
| | C | Write a note on HDLC. | |
| | D | Write a note on Channelization. | |
| | E | Elaborate the concept of ALOHA. | |
| | F | Write a note on Ethernet Protocol. | |
| Que 3 | | **Attempt any Four of the following.** | 20 |
| | A | Write a note on IPV6 Addressing. | |
| | B | Discuss how flow controls to improve QoS. | |
| | C | Differences between user datagram and transmission control protocols. | |
| | D | Elaborate the concept of FTP. | |
| | E | Describe the HTTP methods. | |
| | F | Write a note on Telnet. | |
| Que 4 | | **Attempt any Five of the following.** | |
| | A | State Layers of TCP/IP suite. | 15 |
| | B | Enlist Line coding schemes. | |
| | C | Write a note on SONET. | |
| | D | What is Piggybacking? Explain. | |
| | E | What do you mean by ATM ? Clarify it. | |
| | F | Elaborate the term FDMA. | |

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