

B.Sc. (HONS) IN CSE, THIRD YEAR, SIXTH SEMESTER EXAMINATION, 2020

## SOFTWARE ENGINEERING

Subject Code : 530219

[According to the New Syllabus]

Time—3 hours

Full marks—80

[N.B. The figures in the right margin indicate full marks. Answer any four questions.]

Marks

1. (a) Write down the IEEE definition of Software Engineering. 2+4=6  
What are the challenges facing Software Engineering?
- (b) What is the difference between Software Engineering and System Engineering? 3
- (c) Explain incremental software process model with its merits and demerits. 6
- (d) Write down the Umbrella activities of Software Engineering. 5
2. (a) Explain the functional and non-functional requirement of Software Engineering. 6
- (b) What is Use Case? Depict online food order system with use case diagram. 2+5=7
- (c) Write down the principle of agile process method. 4
- (d) Write a short note on software prototyping. 3
3. (a) Define software design process. State the principles of a software design. 1+5=6
- (b) Distinguish between top-down and bottom-up design. 4
- (c) What is user interface? Explain the principles of user interface design. 1+5=6
- (d) What are the differences between white box and black box testing? 4
4. (a) Differentiate between object oriented and function oriented design. 4
- (b) Why verification and validation is important in software testing? 2+4=6  
Distinguish between software verification and software validation.
- (c) Define code walkthrough and code inspection. 4
- (d) Write short notes on: 6
- (i) Unit testing
  - (ii) Integration testing
  - (iii) Acceptance testing

[Please turn over]



Marks

5. (a) What is Software Quality Assurance (SQA)? Write down the activities of an SQA group. 1+4=5
- (b) What is software maintenance? What are the objectives of software maintenance? 2+3=5
- (c) What is CASE? Explain the basic building block of CASE. 1+4=5
- (d) What is software configuration management? Why software version and release management are essential? 2+3=5
6. (a) Write down pros and cons of top-down integration testing. 4
- (b) What are the factors affecting software pricing? Explain COCOMO model. 2+4=6
- (c) Distinguish between re-engineering and reverse engineering. 4
- (d) What is software reuse? Write the advantages of software reuse. 6



B.Sc (HONS) IN CSE, PART-3, SIXTH SEMESTER EXAMINATION, 2020  
COMPUTER NETWORKING

**Subject Code : 530221**  
*[According to the New Syllabus]*

Time—3 hours

Full marks—80

*[N.B. The figures in the right margin indicate full marks. Answer any four questions.]*

Marks

1. (a) What is Protocol? Describe the functions of different layers of TCP/IP. 5
- (b) Write down some of the design issues that should be considered for an efficient network. 6
- (c) Describe the OSI layers which handles each of the following: 4
  - (i) Breaking the transmitted bit stream into frames.
  - (ii) Determine which route through the subnet to use.
- (d) Show how to provide communication to the top layer of the five layer network. 5
2. (a) What is packet switching? Explain two different approaches of packet switching. 7
- (b) Sketch the frame relay frame format and describe its different fields. 6
- (c) Name and describe the ATM layers with their functions. 7
- (a) What are the differences between classful addressing and classes addressing in IPV4? 5
- (b) Explain the asynchronous TDM with figure. 5
- (c) Differentiate between hard hand off and soft hand off procedure? 5
- (d) What is the purpose of Address Resolution Protocol (ARP)? 5
4. (a) Explain WLAN Architecture. 6
- (b) How does secret key differ from public Key? 4
- (c) Write down two problems in 802.11 MAC sub layer protocol? 5
- (d) An end system sends 50 packets per second data using the User Datagram Protocol (UDP) over a full duplex 100 Mbps Ethernet LAN connection. Each packet consists 1500B of Ethernet frame payload data. What is the throughput, when measured at the UDP layer? 5

*[Please turn over]*



Marks

5. (i) What is SONET and SDH? Which devices are used in SONET transmission?

5

(ii) What is Cryptography? Describe the method of Cryptography Process.

5

(iii) Describe TCP header format.

6

(iv) List the advantages of IPV6 over IPV4.

4

6. Write short notes on (any four):

5×4=20

(i) X-25 network

(ii) Domain Name System (DNS)

(iii) QoS in multimedia network

(iv) VSAT

(v) WIMAX

(vi) Firewall.



B.Sc. (HONS) IN CSE, THIRD YEAR, SIXTH SEMESTER EXAMINATION, 2020  
EMBEDDED SYSTEM PROGRAMMING

Subject Code : 530223  
[According to the New Syllabus]

Time—3 hours

Full marks—80

[N.B. The figures in the right margin indicate full marks. Answer any **four** questions.]

- |  | Marks |
|--|-------|
| 1. (a) What is embedded system? Write down the applications of embedded system.                        | 5     |
| (b) Define system programming. Explain the components of system programming.                           | 6     |
| (c) Differentiate system software and application software.  | 4     |
| (d) Explain IOT in embedded system programming with example.   | 5     |
| 2. (a) Describe general machine structure with diagram.  | 5     |
| (b) Explain frame, client and child windows in details.  | 6     |
| (c) Define the following terms:  | 6     |
| (i) Plug-in  |       |
| (ii) SOAP.   |       |
| (d) How does OLE automation work?  | 3     |
| 3. (a) Define visual programming. Write some pros and cons of visual programming.                      | 5     |
| (b) Compare between regular programming language and visual programming language.                      | 5     |
| (c) What is system programming? What are the difference between 2+5=7 application and system software? |       |
| (d) Define internet programming.   | 3     |
| 4. (a) What is OS? Write down the functions of OS.   | 4     |
| (b) Explain different types of kernel programming.   | 6     |
| (c) Describe the various components of linux.  | 5     |
| (d) Discuss briefly kernel log level string.   | 5     |

[Please turn over



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|--|---|
| 5. (a) Define assembler. What are the basic functions of an assembler?       | 5 |
| (b) Write down the difference between one assembler and multipass assembler. | 5 |
| (c) Discuss about the architecture of 8051 micro controller.                 | 5 |
| (d) What is dynamic linking editors?   | 3 |
| (e) Define language processing system.                                       | 2 |
| 6. (a) Define loader. Write some difference between linker & loader.         | 6 |
| (b) Write down the features of machine dependent and independent loader.     | 5 |
| (c) What is interrupt? How to handle multiple interrupt?                     | 5 |
| (d) Describe bootstrap loader.   | 4 |



**B. Sc (HONS.) IN CSE THIRD YEAR, SIXTH SEMESTER  
EXAMINATION, 2020**

**THEORY OF COMPUTATION**

**Subject Code : 530225**

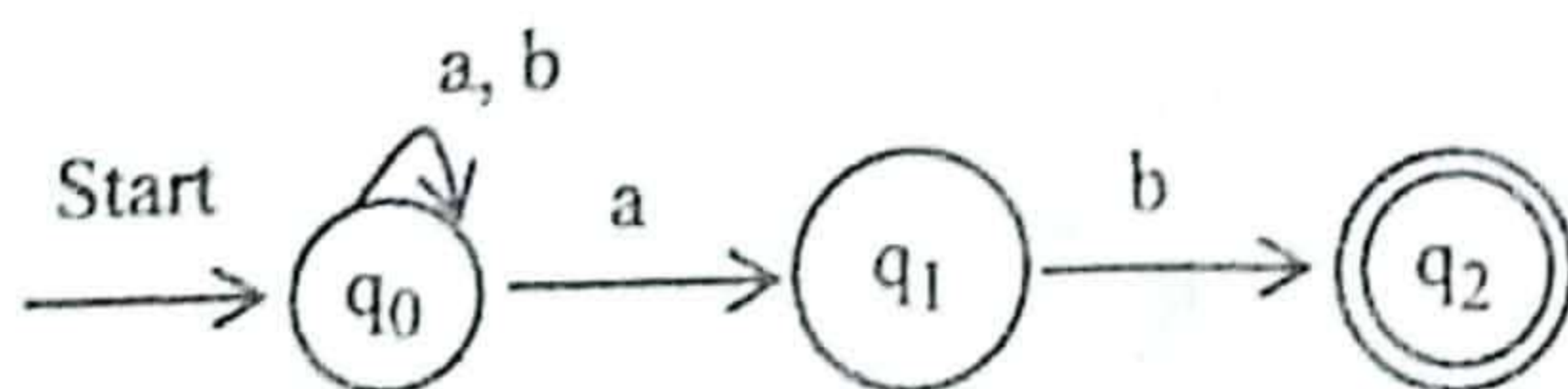
*[ According to the New Syllabus ]*

Time—3 hours

Full marks—80

*[N.B. The figures in the right margin indicate full marks. Answer any four questions.]*

- |  | Marks |
|--|-------|
| 1. (a) Define finite automata. What are the reasons for studying automata theory in computer science?      | 5     |
| (b) What is deductive proof? Prove the theorem, if $x \geq 4$ then $2^x \geq x^2$ (Using deductive proof). | 6     |
| (c) What is binary relation? Write properties of binary relation.  | 5     |
| (d) Explain the following terms with necessary examples :  | 4     |
| i) String  |       |
| ii) Grammar of language  |       |
| 2. (a) Explain $\Sigma^+$ and $\Sigma^*$ .   | 4     |
| (b) Prove that, A language L is accepted by some DFA if and only if L is accepted by some NFA.             | 6     |
| (c) Convert to a DFA the following NFA :   | 6     |



- (d) Design DFA's that accepts—
- i) String start with one and ends with zero.
- ii) String with aa & bb,  $\Sigma \{a, b\}$ .

4

*[Please turn over*



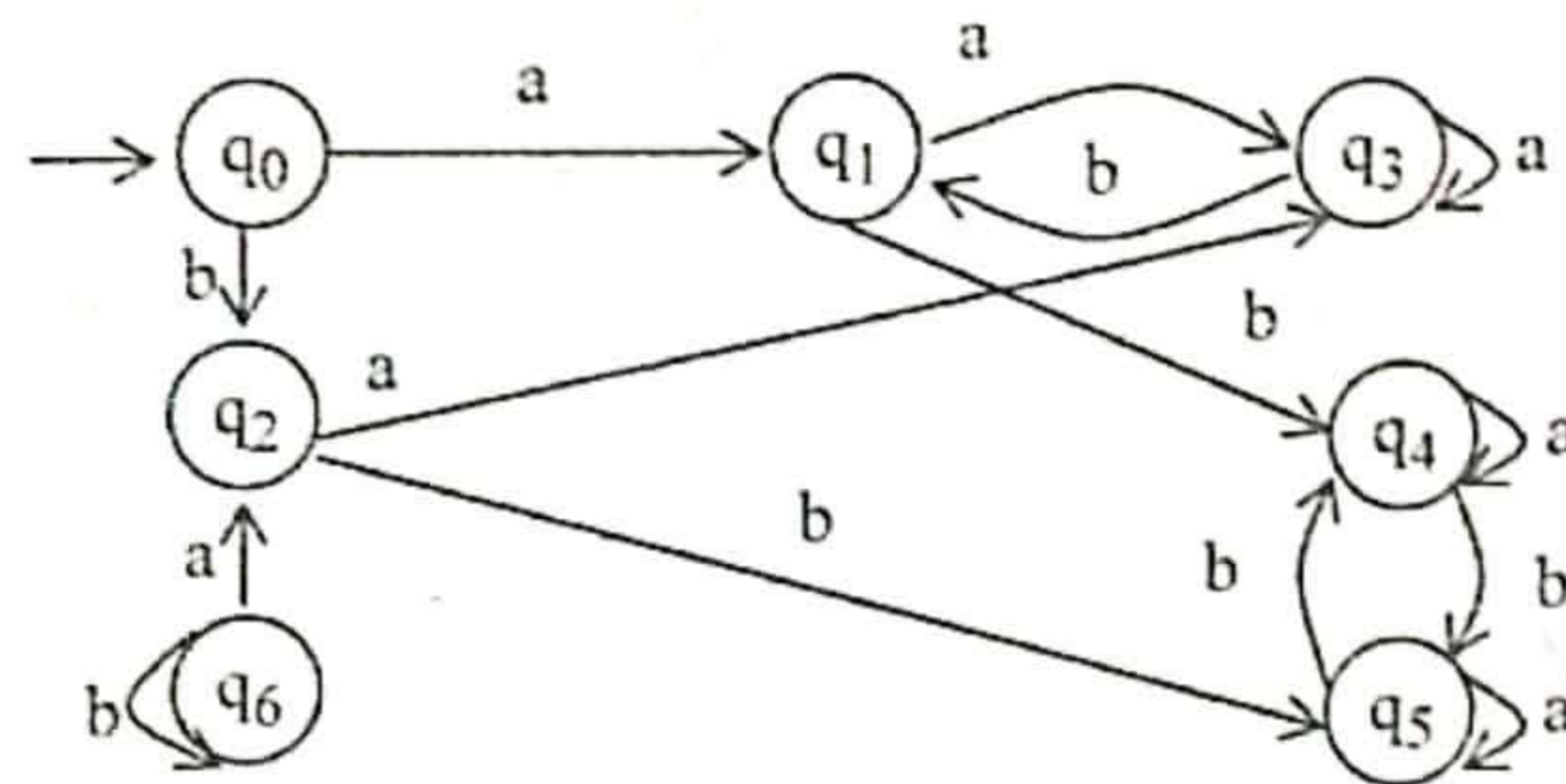
3. (a) Explain the tuple of context free grammar.  
 (b) Discuss the simplification of context free grammar.  
 (c) Find out the CFL for :

$$S \rightarrow aSb \mid aAb$$

$$A \rightarrow bAa$$

$$A \rightarrow bS$$

- (d) Minimize the following DFA by minimization algorithm :

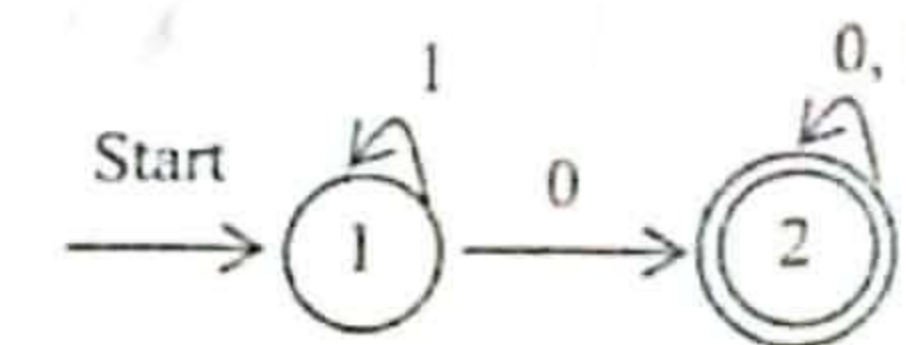


4. (a) Define regular expression. Write down the operators of regular expression.  
 (b) State and prove the pumping lemma for regular expressions.  
 (c) The following grammar generates prefix expressions with operands x and y and binary operators +, -, and \* :

$$E \rightarrow +EE \mid *EE \mid -EE \mid x \mid y$$

- i) Find leftmost and rightmost derivations and a derivation tree for the string  $+ * - xyxy$ .  
 ii) Prove that this grammar is unambiguous.  
 (d) Define homomorphism. Suppose h is the homomorphism from the alphabet  $\{0, 1, 2\}$  to the alphabet  $\{a, b, c\}$  defined by  $h(0) = a$ ,  $h(1) = ab$ ,  $h(2) = bc$ —  
 i) What is  $h(0211)$ ?  
 ii) If L is the language  $L(1 + 20)$ ; What is  $h(L)$ ?

- (a) Define Pushdown Automata (PDA) and Instantaneous Description (ID) of a PDA.  
 (b) Explain different ways of accepting language of pushdown automata.  
 (c) Design a PDA that accepts the language  $L_{ww^R} = \{ww^R \mid w \in (0+1)^*\}$   
 (d) Convert to a regular expression the following DFA :



- (a) Define decidable and undecidable problem.  
 (b) Generate the transition diagram for the Turing Machine that accepts the language  $\{0^n 1^n \mid n > 0\}$ .  
 (c) Define useless symbol and E-production with example.  
 (d) Remove null production from the following :

$$S \rightarrow ASA \mid aB \mid b$$

$$A \rightarrow B$$

$$B \rightarrow b \mid \Sigma$$