SE – 344

VI Semester B.C.A. Examination, September 2020
(CBCS) (F+R) (2016-17 and Onwards)
COMPUTER SCIENCE
BCA 601 : Theory of Computation

Time : 3 Hours

Max. Marks : 100

Instruction : *Answer **all** Sections.*

SECTION – A

Answer **any ten** questions. **Each** question carries **two** marks. **(10×2=20)**

1. Define Alphabet and Symbol with example.
2. Draw a Deterministic Finite Automata (DFA) to accept strings of even number of a's.
3. Define $\in$-closure of a state.
4. State Arden's theorem.
5. Obtain a regular expression for the set of all strings that do not end with 01 over $\Sigma = \{0, 1\}$.
6. Write the meanings of the following regular expression :
   i) $0^* 1^* 2^*$
   ii) $(a + b)^* c$.
7. Define Grammar.
8. What is parsing (derivation) ?
9. Find the language accepted by the following grammar.
   $S \rightarrow aCa$
   $C \rightarrow aCa|b$

P.T.O.

10. Define Chomsky Normal Form (CNF).

11. State post correspondence problem.

12. Mention various types of turing machines.

SECTION – B

Answer **any five** questions. **Each** question carries **five** marks. **(5×5=25)**

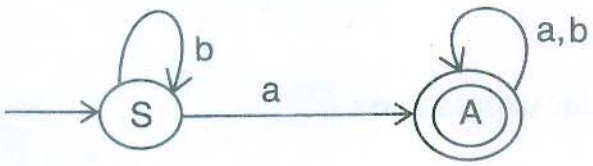
13. Obtain a DFA to accept strings of a's and b's ending with ab or ba.

14. Design NFA to accept the strings abc, acd and abcd.

15. Construct DFA for the regular expression $ab^* + b$.

16. Prove that the language $L = \{WW^r/W \in (a + b)^*\}$ is not regular. W^r is the reverse of the string W.

17. Obtain grammar for the following DFA.



18. Eliminate left recursion from the grammar.

    $S \rightarrow Ab/a$

    $A \rightarrow Ab/Sa$

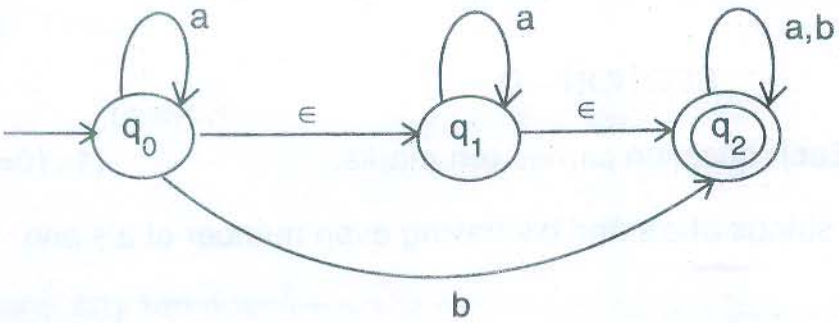
19. Construct a PDA to accept the language $L = \{a^n b^{2n}/n \geq 1\}$ by final state. (PDA : Push Down Automata)

20. Explain the model of turing machine with mathematical representation.

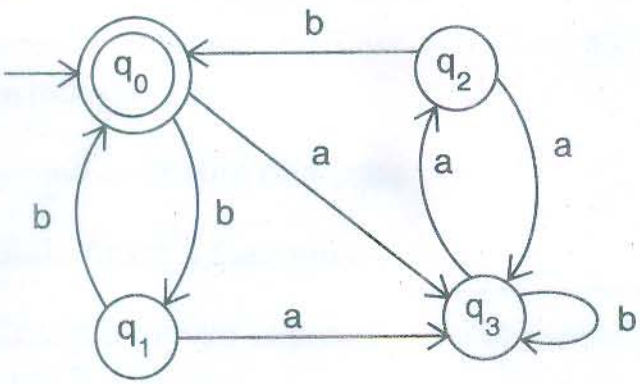
SECTION – C

Answer **any three** questions. **Each** question carries **fifteen** marks. **(3×15=45)**

21. Convert the following ∈-NFA to its equivalent DFA.



22. Minimize the following DFA.



23. a) Explain Noam Chomsky hierarchy of generative grammars with suitable examples. **8**

    b) Define ambiguous grammar and show that the following grammar is ambiguous

    $S \rightarrow aB/bA$

    $A \rightarrow aS/bAA/a$

    $B \rightarrow bS/aBB/b$ **7**

24. a) Eliminate unit productions from the following grammar. **8**

    $S \rightarrow AB$

    $A \rightarrow D$

    $D \rightarrow a$

    $B \rightarrow F$

    $F \rightarrow b$

b) Eliminate $\in$-productions from the following grammar.

$S \rightarrow AB$

$A \rightarrow aAA/\in$

$B \rightarrow bBB/\in$ 7

25. Obtain a turning machine to accept the language $L = \{0^n 1^n / n \geq 1\}$. 15

SECTION – D

Answer **any one** question. **Each** question carries **ten** marks. **(1×10=10)**

26. Obtain a DFA to accept strings of a's and b's having even number of a's and even number of b's.

27. Define Greibach Normal Form (GNF). Convert the following context free grammar into GNF.

$S \rightarrow AB$

$A \rightarrow BSB$

$A \rightarrow a$

$B \rightarrow b$

SE – 345

VI Semester B.C.A. Examination, September 2020
(CBCS) (F + R) (2016 – 17 & Onwards)
COMPUTER SCIENCE
BCA 602 – System Programming

Time : 3 Hours Max. Marks : 100

Instruction : *Answer* ***all*** *Sections.*

SECTION – A

I. Answer **any ten** questions, **each** question carries **two** marks. **(10×2=20)**

1) Define : (a) System Software (b) Application Software.
2) Mention any two differences between compiler and interpreter.
3) Define : (a) Register operand (b) Storage operand.
4) Explain : (a) USING (b) DROP.
5) Write the format of MOT.
6) Differentiate DC and DS.
7) Differentiate AIF and AGO.
8) Define macro.
9) What is binder ?
10) What is loader ? Mention its functions.
11) What is token ? Give an example.
12) Explain identifier table.

SECTION – B

II. Answer **any five** questions, **each** question carries **five** marks. **(5×5=25)**

13) Explain micro flow chart for ADD instruction.
14) Explain interchange sort with an example.
15) What are the functions of a macroprocessor ?
16) Explain "Compile and go" loader.

P.T.O.

17) Explain machine dependent optimization.

18) Explain address modification using instruction as data.

19) Explain conditional macro with an example.

20) Explain pseudo-op and machine-op with an example.

SECTION – C

III. Answer **any three** questions, **each** question carries **fifteen** marks. **(3×15=45)**

21) a) Explain data formats used in IBM 360 systems. **8**

b) Explain General machine structure of IBM 360/370 with a neat block diagram. **7**

22) a) Explain detailed pass-1 assembler flow chart. **8**

b) Explain binary search with an example. **7**

23) a) Explain simple one pass macroprocessor with flow chart. **8**

b) Explain ALA, MDT, MNT with an example. **7**

24) a) Explain detailed pass-1 flow chart of loader. **8**

b) Describe four types of cards used in direct linking loader. **7**

25) a) Explain the structure of a compiler with a block diagram. **8**

b) Explain syntax phase with an example. **7**

SECTION – D

IV. Answer **any one** question, **each** question carries **ten** marks. **(1×10=10)**

26) a) Explain formal system. **5**

b) Explain Time sharing OS. **5**

27) a) Explain data bases used in pass-1 and pass-2 of an assembler. **5**

b) Explain : (a) macro language (b) macro processor. **5**

SE – 346

VI Semester B.C.A. Examination, September 2020
(CBCS – F+R Scheme)
(2016-17 and Onwards)
COMPUTER SCIENCE
BCA 603 : Cryptography and Network Security

Time : 3 Hours Max. Marks : 100

***Instruction** : Answer **all** the Sections.*

SECTION – A

Answer **any ten** questions. **(10×2=20)**

1. Define cryptography.
2. Define Hashing.
3. What is data integrity ?
4. What is Affine cipher ?
5. What is Brute force attack ?
6. Define Residue class.
7. What is co-prime ? Give example.
8. What is trapdoor one-way function ?
9. What is Kerberos ?
10. What is message padding ?
11. Define digital signature.
12. Define Hijacking.

SECTION – B

Answer **any five** questions. **(5×5=25)**

13. Discuss the classification of security goals.
14. Find GCD(2740, 1760) using Euclidean algorithm.

P.T.O.

15. Write a neat diagram and explain the general structure of DES.

16. Explain transpositional cipher with an example.

17. Explain CBC mode of operation.

18. Explain Fermat's little theorem.

19. Briefly explain the architecture of SSL.

20. Explain the practical applications of watermarking.

SECTION – C

Answer **any three** questions. **Each** question carries **15** marks.

21. a) Explain the types of cryptanalysis attacks. **(8+7)**
    b) List four properties of divisibility.

22. a) Draw the block diagram of DES algorithm. Explain briefly. **(8+7)**
    b) Write a short note on multiple DES.

23. a) Explain the rules of play fair cipher with an example. **(8+7)**
    b) Differentiate between symmetric and asymmetric key cryptography.

24. a) State and explain Chinese remainder theorem with an example. **(8+7)**
    b) Discuss different attacks on RSA.

25. a) Explain Public Key Infrastructure (RKI) in detail. **(8+7)**
    b) Differentiate between MIME and S/MIME.

SECTION – D

Answer **any one** question. **(1×10=10)**

26. Discuss in detail block cipher modes of operations.

27. Explain SHA-512 algorithm with a neat diagram.

SE – 347

VI Semester B.C.A. Degree Examination, September 2020
(CBCS) (F + R) (2016-17 and Onwards)
COMPUTER SCIENCE
BCA 604 : Web Programming

Time : 3 Hours Max. Marks : 70

Instruction : *Answer **all** Sections.*

SECTION – A

I. Answer **any ten** questions. **Each** question carries **two** marks. **(10×2=20)**

1) Define Internet.
2) Define Web server.
3) What is the use of <br/> tag in XHTML ?
4) What are the different types of http request methods ?
5) What is URL ? Write the parts of URL.
6) What is DNS ?
7) Write the basic syntax of selector in CSS.
8) What is window.alert () ?
9) List any two keyboard events.
10) Mention the attributes of <input> tag.
11) Define XML.
12) What is a DTD ?

SECTION – B

II. Answer **any five** questions. **Each** question carries **ten** marks. **(5×10=50)**

13) a) Write the applications of Internet. **5**
    b) Write the standard XHTML document structure with example. **5**
14) a) Explain Table tags and its sub tags with example. **6**
    b) Give syntax and example to below tags :
    (i) <pre> (ii) <img>. **4**

P.T.O.

15) a) Write an XHTML document to describe an order list of your favourite movies. Each element of the list must have a nested list of atleast two actors in your favourite movies. **6**

b) Explain and tag with example. **4**

16) a) How to include the external style sheet in CSS ? **5**

b) What is a selector in CSS ? Explain the pseudo class selector in CSS with example. **5**

17) a) What is a Java script ? Write the data types supported by Java Script. **5**

b) Write a Java Script code to find the reverse of a number. **5**

18) a) Explain the CSS box model. **5**

b) What is a form ? Write the major attributes of the form. **5**

19) a) What is an array in Java script ? How to create an array object explain with an example. **5**

b) Write a java script program to illustrate mouse events. **5**

20) a) Briefly explain the XML namespace. **5**

b) Write the differences between DOM and SAX. **5**

SE – 375

Question Booklet Sl. No. 601556

VI SEMESTER B.A./B.Sc./B.C.A./B.S.W./B.Sc. (IDD)/ B.Sc. (FAD) EXAMINATION, SEPTEMBER 2020

Version Code **A**

(CBCS) (F+R) (2016 – 17 & Onwards)

COMPUTER SCIENCE

Computer Application and Information Technology

Time Allowed : 3 Hours ***Maximum Marks : 70***

INSTRUCTIONS TO CANDIDATES

1. Immediately after the commencement of the Examination, you should check that this Booklet does not have any unprinted or torn or missing pages or items, etc. If any of the above defects is found, get it replaced by a Complete Question Booklet of the available series.
2. Write clearly the Question Booklet Version Code **A, B, C, D** or **E** in the appropriate space provided for the purpose, in the OMR Answer Sheet.
3. Enter the name of the Subject, Reg. No., Question Booklet version code and affix Signature on the OMR sheet. As the answer sheets are designed to suit the Optical Mark Reader (O.M.R.) system, special care should be taken to fill those items accurately.
4. This Question Booklet contains **55** questions, **Part – A** contains **40** questions of **one** mark each. **Part – B** contains **15** questions of **two** marks **each. All** questions must be attempted. Each question contains four answers, among them one correct answer should be selected and shade the corresponding option in the OMR sheet.
5. All the answers should be marked only on the OMR sheet provided and only with a **black** or **blue** ink ball point pen. If more than one circle is shaded / wrongly shaded / half shaded for a given question no marks will be awarded.
6. Immediately after the final bell indicating the closure of the examination, stop making any further markings in the OMR Answer Sheet. Be seated till the OMR Answer Sheet is collected. After handing over the OMR Answer Sheet to the Invigilator you may leave the examination hall.

P.T.O.

PART – A

Answer **all** the questions. **Each** question carries **1** mark. **(40×1=40)**

1. In a relational schema, each tuple is divided into
   a) Relations b) Domains c) Columns d) All the above

2. In a ER model _____ is described by storing attributes.
   a) Entity b) Attribute
   c) Relationship d) Notation

3. DFD stands for
   a) Data Flow Document b) Data File Diagram
   c) Data Flow Diagram d) None of the above

4. _____ defines the structure of a relation.
   a) Instance b) Schema c) Program d) Super Key

5. Full form of SQL is
   a) Standard Query Language b) Sequential Query Language
   c) Structured Query Language d) Server side Query Language

6. _____ Key represent relation between tables.
   a) Primary Key b) Secondary Key
   c) Foreign Key d) None of the above

7. The database schema is written in
   a) HLL b) DML c) DDL d) DCL

8. In an E-R diagram an entity is represented by
   a) Rectangle b) Ellipse c) Diamond Box d) Circle

9. Processed data is called
   a) Raw data b) Information c) Useful data d) Source

10. Large collection of tables is called
    a) Fields b) Records c) Database d) Sectors

SPACE FOR ROUGH WORK

11. The File name of MS Word document is named with an extension
    a) .doc b) .msw c) .txt d) .wrd

12. In MS Word, shortcut key used to save a word document is
    a) Ctrl + S b) Ctrl + C c) Ctrl + V d) Ctrl + Z

13. In MS Word, Ctrl + I is used to
    a) Increases font size b) Inserts line break
    c) Makes text bold d) Applies italic to selected text

14. Thesaurus tool in MS Word is used for
    a) Grammar option b) Spelling checking
    c) Formatting document d) Synonyms and Antonyms

15. How many ways you can save a word document ?
    a) 3 b) 4 c) 5 d) 6

16. In MS Excel, if a text cannot fit in a cell, then
    a) It will be hidden b) It will be deleted
    c) It cannot be entered d) None of the above

17. In MS Excel, if you enter the function = TODAY( ) and press enter key, it returns
    a) Current day b) Current date
    c) Current day and date d) Current day, date and time

18. In MS Excel formulae starts with
    a) = b) + c) % d) –

19. The intersection of a row and column in MS Excel is called
    a) Address b) Range c) Cell d) Column

20. We can activate a cell by
    a) Pressing the tab key b) Clicking the cell
    c) Pressing an arrow key d) All the above

SPACE FOR ROUGH WORK

21. Special effects used to introduce slides in presentation is
    a) Effects
    b) Custom animations
    c) Transitions
    d) Animations

22. Which of the following is not an option when printing slides ?
    a) Six slides per page
    b) Five slides per page
    c) Three slides per page
    d) Two slides per page

23. Which of the following is default page orientation in Powerpoint ?
    a) Vertical
    b) Landscape
    c) Portrait
    d) None of the above

24. Microsoft Access is a
    a) RDBMS
    b) OODBMS
    c) ORDBMS
    d) Network Database Model

25. The file extension for an Access database is
    a) EXE
    b) DOC
    c) EXC
    d) MDB

26. Which of the following is a correct format of E-mail address ?
    a) name@website@info
    b) name@website.info
    c) www.nameofebsite.com
    d) name.website.com

27. Full form of WWW in web address is
    a) World Wide Word
    b) World Wide Wood
    c) World Wide Web
    d) All the above

28. To design webpages we need to use
    a) Server
    b) XML
    c) Browser
    d) HTML

29. How can you make a list for listing items in bullets ?
    a) < ol >
    b) < list >
    c) < ul >
    d) < dl >

30. DTP stands for
    a) Draw Top Publishing
    b) Desk Top Publishing
    c) Desk Town Publishing
    d) None of these

SPACE FOR ROUGH WORK

31. Which products are people most likely to buy on the Internet ?
    a) Books
    b) PCs
    c) CDs
    d) All of the above

32. The solution for all business needs is
    a) EDI
    b) ERP
    c) SCM
    d) None of the above

33. Which is a function of E-commerce ?
    a) Marketing
    b) Advertising
    c) Warehousing
    d) All the above

34. Which is a function of ERP ?
    a) Warehousing
    b) Sales
    c) Scheduling
    d) All the above

35. Most individuals are familiar with which form of E-commerce ?
    a) B2B b) B2C c) C2B d) C2C

36. ERP stands for
    a) Enterprise Resolution Plan
    b) Enterprise Reverse Plan
    c) Enterprise Resource Planning
    d) None of the above

37. What is the process of making a copy of the information stored on computer ?
    a) Backup b) Antivirus c) Firewall d) Biometrics

38. What is hardware and software that protects computer from intruders ?
    a) Backup b) Antivirus c) Firewall d) Biometrics

39. Which is known as plastic money ?
    a) Credit card
    b) Paytm
    c) Paper cash
    d) All the above

40. E-banking is known as
    a) ATMs
    b) Net banking
    c) Traditional banking
    d) None of these

SPACE FOR ROUGH WORK

PART – B

Answer **all** the questions. **Each** carries **2** marks. **(15×2=30)**

41. ODBC stands for
    a) Object Database Connectivity
    b) Oral Database Connection
    c) Oracle Database Connection
    d) Open Database Connectivity

42. A table can have only one
    a) Secondary key
    b) Alternate key
    c) Unique key
    d) Primary key

43. Attribute of one table matching to the primary key of other table is called as
    a) Foreign key
    b) Secondary key
    c) Candidate key
    d) Composite key

44. In ER diagram derived attribute is represented by
    a) Ellipse
    b) Dashed ellipse
    c) Rectangle
    d) Triangle

45. Which of the following is considered as DBMS ?
    a) Access
    b) Oracle
    c) Foxpro
    d) All the above

46. In MS Word borders can be applied to
    a) Cells
    b) Paragraph
    c) Text
    d) All of above

47. Ruler in MS Word helps us to
    a) To set tabs
    b) To set indents
    c) To change page margins
    d) All of above

48. Which of the following line spacing is invalid ?
    a) Single
    b) Double
    c) Triple
    d) Multiple

SPACE FOR ROUGH WORK

49. Superscript, subscript, outline, emboss, engrave are known as
    a) Font style
    b) Font effects
    c) Word art
    d) Text effects

50. Which area in an MS Excel Window allows entering values and formulas ?
    a) Title Bar
    b) Menu Bar
    c) Formula Bar
    d) Standard Toolbar

51. In a worksheet of MS Excel we can select
    a) Entire worksheet
    b) Rows
    c) Columns
    d) a), b) and c)

52. Queries in MS Access can be used as
    a) View, change and analyze data in different ways
    b) A source of records for forms and reports
    c) Only a)
    d) Both a) and b)

53. Which option can be used to add a slide to an existing presentation ?
    a) File, add a new slide
    b) Insert, new slide
    c) File, open
    d) File, new

54. URL stands for
    a) Universal Resource Locator
    b) Uniform Resource Locator
    c) Uniform Radio Locator
    d) None of the above

55. Which of the following describes E-commerce ?
    a) Doing business electronically
    b) Doing business
    c) Sale of goods
    d) All of the above

SPACE FOR ROUGH WORK