BCACTISDat/Lib

Roll No. ..... Total Pages : 3

3501

NBCA/D-23

PROBLEM SOLVING THROUGH C

Paper–B23-CAP/101/CTS/CDS

(CC-A1/DS-A1)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is Compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Define an Identifier and rules for naming an Identifier in C language.

(b) Differentiate between \n, \t, \a and \r escape sequences.

(c) Differentiate = and == operators in C language.

(d) Write a note on break statement.

(e) What is a prototype function declaration in C language? (2×5=10)

UNIT–I

2. (a) Why C language is named so? (5)

(b) Write five features of C language. (5)

3. Differentiate between :

(a) scanf() and getch() function. (5)

(b) printf() and putch(). (5)

UNIT–II

4. (a) Write arithmetic and assignment operators available in C language and there precedence order. (5)

(b) Differentiate a preoder ++I and postorder i++ increment. (5)

5. Write notes on :

(a) Mixed mode expression evaluation. (5)

(b) Data type casting in basic data types. (5)

UNIT–III

6. (a) Explain nested if statement by using an example. (5)

(b) Write a program in C language to find largest of three numbers a, b and c. (5)

7. (a) Differentiate a for-loop and a while-loop. (5)

(b) How a loop is terminated without completion abnormally? (5)

UNIT–IV

8. (a) Define a library function in C language program. Explain role of library function. (5)

   (b) Write a program to swap two values x and y in C language. (5)

9. (a) How a one dimensional array is declared and assigned values in C language? (5)

   (b) Write a program to add two matrix (two dimensional array) in C language. (5)

Roll No. ..... Total Pages : 3

3502

NBCA/D-23

FOUNDATIONS OF COMPUTER SCIENCE

Paper–B23/CAP/CTS/CDS-102

(CC-B1/DS-B1)

(CTIS)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* questions in all, selecting at least *one* question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) What is a shortcut? How it is created?
   (b) Write limitations of using Computers.
   (c) What are Cookies? How cookies work?
   (d) What are basic parts of email address?
   (e) How can you change the mouse settings?

(5×2=10)

UNIT–I

2. Draw a block diagram to illustrate basic organization of a Computer System and explain the functions of various units. (10)

3. (a) What is a Primary Memory? Write note on RAM, ROM, PROM and EPROM. (5)

(b) List advantages and Limitations of Optical Disk as secondary storage device. (5)

UNIT–II

4. (a) What is the purpose of I/O ports of Desk Top Computer? Discuss Serial, Parallel, USB and PS-2 ports. (5)

(b) Discuss various pointing devices. (5)

5. Write short notes on following :

(a) Recycle Bin.

(b) Status Buttons.

(c) My Document.

(d) Desktop. (10)

UNIT–III

6. (a) What is Computer Network? Why we need it? (5)

(b) Explain working of Internet. (5)

7. (a) What do you mean by Search Engine? Explain steps of net surfing using search engines. (5)

(b) Write steps to create e-mail. (5)

UNIT–IV

8. (a) What is Computer System Threat? Explain with Examples Physical and Non-Physical threats. (5)

(b) What is hacking? How it is different from Cracking? (5)

9. What do you mean by Computer Security? Discuss its objectives/goals. (10)

Roll No. ..... Total Pages : 3

3503

NBCA/D-23

LOGICAL ORGANISATION OF COMPUTER

Paper : B23-CAP-103

(CC-C1)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *five* questions in all, selecting *one* question from each unit. All questions carry equal marks.

Compulsory Question

1. (a) Prove that 2421 is self complimenting code.

(b) State and prove Demorgans' Law.

(c) Make excitation table of T and JKFF.

(d) Differentiate Combinational and Sequential circuits.

UNIT–I

2. Convert as follows :

(a) (i) $(17.625)_{10}$ to Binary, Octal and Hexadecimal.

(ii) What is number in Binary and Octal for 2C2BF7.

(iii) What is $(X)_2 = (235)_6$.

(iv) (101010111110) to Octal and Hexadecimal.

3. (a) Write coding scheme for 8421 and for Error Detection and Correction system.

(b) Perform 2's compliment arithmetic

–22–10 and –32–17.

UNIT–II

4. (a) Define Boolean algebra and write its postulates

Solve Using Boolean Algebra.

$(xx + yy)\ (xxzz + zz)\ (\overline{y}\,\overline{\overline{y} + x}\,\overline{x}\,z\,\overline{z}) = \overline{x}xyyzz.$

5. (a) Draw and Label 4 Variable K-Map and solve for four corners.

(b) (i) Solve using K-Map Z = Σ1, 3, 5, 7, 9, 13, 15.

(ii) Solve using K-Map Z = ππ, 00, 22, 44, 66.

UNIT–III

6. (a) Make circuit using NAND gates only by solving Full Adder.

(b) Make circuit and explain 4 : 1 Multiplexer and 10 to 4 line encoder.

7. (a) Make TT and diagram for 3 input AND and NOR gate.

(b) Prove that NAND is universal gate.

(c) Make Full Adder using NAND gates only.

UNIT–IV

8. Explain Clocked SRFF, its problem and solution.

9. (a) Explain Master Slave JKFF to solve Race round problem.

(b) Make Shift register to store 1011.

Roll No. ..... Total Pages : 4

NBCA/D-23 **3504**

MATHEMATICAL FOUNDATIONS FOR

COMPUTER SCIENCE–I

Paper–B23-CAP-104

(CC-M1)

Time : Three Hours] [Maximum Marks : 20

Note : Attempt any *five* questions, selecting *one* question from each unit. Question No. 1 is compulsory.

Compulsory Question

1. Write following set in roster form :

(a) $A = \{x : x \text{ is an integer and } -3 < x < 7\}$.

(b) Construct a 3×3 matrix whose elements are given by

$$a_{ij} = \frac{i}{j}.$$

(c) Write the next terms of the following sequence :

3, 6, 11, 18, 27, ...

(d) Write derivative of $\frac{1}{\sqrt{x}}$. (1,1,1,1)

UNIT–I

2. (a) Find the power set of $\{a, b, c\}$.

(b) State whether following sets are finite or infinite.

(i) $\{x : x \in Z \text{ and } x^2 = 36\}$.

(ii) $\{x : x \in R \text{ and } 0 < x < 1\}$. (2,2)

3. (a) If A = {4, 5, 8, 12}
B = {1, 4, 6, 9}
C = {1, 2, 3, 4}
then find A – (C – B) and A – (B – A).

(b) If A = {1, 3, 5, 7}, B = {3, 5, 6, 8, 10} and U = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10} verify that $(A \cup B)' = A' \cap B'$ and $(A \cap B)' = A' \cap B'$. (2,2)

UNIT–II

4. If $A = \begin{bmatrix} 4 & 3 & 7 \\ 6 & 5 & -8 \\ 1 & 2 & 6 \end{bmatrix}$, express A as the sum of a symmetric and a skew symmetric matrix. (4)

5. Find A^{-1}, where $A = \begin{bmatrix} 1 & 2 & -3 \\ 2 & 3 & 2 \\ 3 & -3 & -4 \end{bmatrix}$. Hence, solve the system of linear equations.

$$x + 2y - 3z = -4$$

$$2x + 3y + 2z = 2$$

$$3x - 3y - 4z = 11.$$ (4)

UNIT–III

6. (a) Find the real roots of the following quardratic equations, if they exist using the quadratic formula :

$$3x^2 + 16x + 5 = 0.$$

(b) Solve the following quadratic equation by completing the square method :

$$2x^2 - 5x + 3 = 0. \qquad (2,2)$$

7. (a) The sum of three numbers is 24 and their product is 440. Find the numbers.

(b) Show the three number a, b, c are in A.P., G.P. or H.P. according as :

$$\frac{a-b}{b-c} = \frac{a}{a}, \frac{a}{b} \text{ or } \frac{a}{c} \text{ respectively.} \qquad (2,2)$$

UNIT–IV

8. (a) Differentiate $\frac{2x+3}{x^2-5}$ w.r.t. x.

(b) If $y = v^3 + 2v^2 + 5$; $v = 34 + 1$ and $u = 9x + 1$ find $\frac{dy}{dx}$.

(2,2)

9. (a) Find $\frac{dy}{dx}$ of $\cos(x + y) = y \sin x$.

(b) A car starts from a point P at time $t = 0$ seconds and stops at point Q. The distance x in metres, covered by it in t seconds is given by $x = t^2\left(2 - \frac{t}{3}\right)$. Find the time taken by it to reach Q and also find distance between P and Q. (2,2)

Roll No. ..... Total Pages : 3

3304

NBAE/D-23

ENGLISH

(English Language and Communication Skills : Level-I)

Paper –B23-AEC-E-101

Time : Three Hours] [Maximum Marks : 35

Note : Attempt *five* questions in all, selecting *one* question each from all the four units. Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer in about 30 words each :

(i) What do you mean by communication?

(ii) Write the advantages of non-verbal communication?

(iii) What is Grapevine communication?

(iv) Write a note on Making Request.

(v) What is Mapping method?

(vi) Explain Active listening.

(vii) Write a short note on Reflexive pronouns.

UNIT–I

2. 'Communication is a two-way process.' Explain.

3. Discuss the disadvantages of written communication.

UNIT–II

4. What is Formal communication? Explain its merits.

5. What do you understand by introducing others?

UNIT–III

6. What do you mean by Listening skills? Discuss the importance of listening in business communication.

7. Explain the various methods of note taking.

UNIT–IV

8. Attempt as directed :
   (i) ..... is my house (Insert suitable pronoun)
   (ii) I met Mohan ..... the crossroads.
   (Insert suitable preposition)
   (iii) I don't agree ..... you. (Insert suitable preposition)
   (iv) Love ....., faith go together.
   (Insert appropriate conjunction)
   (v) He cried ..... a mad man.
   (Insert appropriate conjunction)
   (vi) ..... we won the match.
   (Insert suitable interjection)
   (vii) Of these two books, this is ..... (good)
   (Use proper degree of adjective to fill in the blank)

9. Do as directed :

(a) Classify the underlined nouns.

(i) Health is a great blessing.

(ii) It is a glass jar.

(b) Fill in the correct form of words :

(iii) Who is the ..... man in India? (rich)

(iv) This is the ..... book, I have ever read. (interesting)

(c) Pick out verb groups in the following sentences :

(v) Ramesh wants more ice-cream.

(vi) He has been flying kite for three hours.

(d) Rewrite the sentence and use the adverb correctly :

(vii) He walks his dog. (rarely)

Roll No. ..... Total Pages : 2

3462

NGSE/D-23

COMPUTER SCIENCE

(Introductory Course in R)

Paper–B23-SEC-105

(SEC-1)

Time : Three Hours] [Maximum Marks : 35

Note : Attempt *five* Questions. Question *one* is compulsory. In addition to 1st question attempt *four* more questions by selecting one question from each unit.

Compulsory Question

1. (a) Explain HELP Function in R. (2)

(b) Explain String vector with example. (3)

(c) Explain the concept of String Manipulation in R. (2)

UNIT–I

2. What do you mean by programming in R? Explain the concept of Installation of libraries in R. (7)

3. Explain the Conditional Statement in R with Example. (7)

UNIT–II

4. Explain the Packages in R with example. (7)

5. What do you mean by Higher Dimensional Array? Explain Vector distinction with example. (7)

UNIT–III

6. Explain the process of applying function to data Frames. (7)

7. Explain different R Operation using List. (7)

UNIT–IV

8. Explain Basic Statistical Function in R with example. (7)

9. Explain the concept of Simulation in R. (7)

Roll No. ..... Total Pages : 3

3399

NGSE/D-23

ENVIRONMENTAL STUDIES

Paper : B23-VAC-201

(VAC-1)

Time : Three Hours] [Maximum Marks : 35

Note : Attempt *five* questions in all, selecting *one* question from each unit. Question No. 1 is compulsory.

नोट : प्रत्येक इकाई से **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्न कीजिए। प्रश्न संख्या 1 अनिवार्य है।

Compulsory Question

(अनिवार्य प्रश्न)

1. Explain the following :

निम्नलिखित पर संक्षिप्त टिप्पणियाँ लिखिए :

(a) Hydropower.

जलविद्युत।

(b) Cyclones.

चक्रवात।

(c) Endangered reptiles of India.

भारत के लुप्तप्राय सरीसृप।

(d) Sustainable development.

सतत विकास।

(e) Landfills.

अपशिष्ठ भराव क्षेत्र।

(f) Food chain.

खाद्य शृंखला।

(g) Acid rain. (7×1=7)

अम्लीय वर्षा।

UNIT–I (इकाई–I)

2. Discuss the scope and importance of the environmental studies. (7)

पर्यावरण अध्ययन के दायरे और महत्व पर चर्चा करें।

3. Define an ecosystem, Explain the structure and function of a grassland ecosystem. (7)

पारिस्थितिकी तंत्र को परिभाषित करें। चरागाह पारिस्थितिकी तंत्र की संरचना और कार्य की व्याख्या करें।

UNIT–II (इकाई–II)

4. What is land degradation? How soil erosion is related to the degradation of the land? (7)

भूमि निम्नीकरण क्या है? मृदा अपरदन का भूमि के निम्नीकरण से क्या संबंध है?

5. Write a note on the conservation of the biodiversity. (7)

जैव विविधता के संरक्षण पर एक नोट लिखें।

UNIT–III (इकाई–III)

6. Explain the following :

निम्नलिखित की व्याख्या करें :

(a) Noise pollution.

ध्वनि प्रदूषण।

(b) Water (Prevention and Control of Pollution) Act, 1974. (3,4)

जल (प्रदूषण की रोकथाम और नियंत्रण) अधिनियम, 1974.

7. What is ozone layer? What are the sources responsible for the depletion of ozone layer and how it is affecting the health of organisms? (7)

ओजोन परत क्या है? ओजोन परत के क्षरण के लिए जिम्मेदार स्रोत क्या हैं और यह जीवों के स्वास्थ्य को कैसे प्रभावित कर रहा है?

UNIT–IV (इकाई–IV)

8. Describe the factors affecting human population growth and its impacts on the environment and human health. (7)

मानव जनसंख्या वृद्धि को प्रभावित करने वाले कारकों और पर्यावरण एवं मानव स्वास्थ्य पर इसके प्रभावों का वर्णन करें।

9. What is disaster management? Explain the causes and control measures for flood disaster. (7)

आपदा प्रबंधन क्या है? बाढ़ के कारण एवं नियंत्रण उपाय बताइये।

BCA CTIS Ist/Lib

Roll No. ..... Total Pages : 03

GSE/D-23 **1165**

FUNDAMENTALS OF COMPUTER SCIENCE

BCA-CTIS-101

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. Discuss the following : **12**

(a) Computer
(b) Flash Memory
(c) WWW
(d) Debugging
(e) URL
(f) BCD
(g) Pseudocode
(h) Access time.

Unit I

2. (a) Draw a block diagram to illustrate the basic components of a computer system and explain the functions of various units. 6

(b) What is a system ? Why is a computer often referred to as a computer system ? Explain the advantages of computer system. 6

3. (a) Convert the following : 6

(i) $(110.101)_2$ into Decimal

(ii) $(11010011)_2$ into Octal and Hexadecimal.

(b) What is the Logic Gate ? Explain the AND and OR gate with suitable example. 6

Unit II

4. Describe the program development cycle in detail with suitable diagram. 12

5. What do you understand by DFD ? Explain the DFD for Railway Reservation System in detail. 12

Unit III

6. Discuss the term memory hierarchy. Explain the structure of Hard Disk in detail and write its advantages. 12

7. What do you understand by printer ? Explain its types in detail. 12

Unit IV

8. (a) Discuss ISP. Explain the working of Internet Service Provider in detail. 6

   (b) Explain FTP and IRC. 6

9. What is e-mail ? Discuss the step-by-step procedure to send an e-mail. Write down the advantages and disadvantage of e-mail. 12

Roll No. ..... Total Pages : 03

GSE/D-23 1166

PROGRAMMING WITH C

BCA-CTIS-102

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory. Attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

(Compulsory Question)

1. (a) Differentiate between constant and variables.

(b) Out of printf() and puts(), which statement is better for output of a string ?

(c) Can one type of data be converted into another ? Give an example.

(d) Comment on the purpose of default case in switch statement.

(e) How can you pass an array to a function ?

(f) Name the various operations that can't be applied on pointers.

(g) Comment on the need of structure.

(h) Name any *two* functions used for dynamic allocation.

8×1.5=12

Unit I

2. (a) Describe the various rules for naming of an identifier. **6**

   (b) What is the difference between formatted and unformatted I/O statements ? Explain using suitable examples. **6**

3. Explain the following : **12**

   (i) Character set of C

   (ii) Keywords

   (iii) Symbolic constant

   (iv) History of C.

Unit II

4. (a) What do understand by unary, binary and ternary operators in 'C' ? Explain with examples. **6**

   (b) Write a program in 'C' to swap the values of two variables without the use of third variable. **6**

5. (a) Write a program in C to check whether the input number is palindrome or not. **6**

   (b) Discuss various types of branching statements used in C language using suitable examples. **6**

Unit III

6. What do you mean by array ? Explain various types of arrays in detail: How arrays are stored in computer memory ? Write a program in C to biggest of n numbers. **12**

7. (a) Differentiate between call by value and call by reference. 6

(b) Comment on the scope and lifetime of local and global variables. 6

Unit IV

8. Write a program in C to sort a list of strings. 12

9. How can you create and use following in C : 12

(i) Structures within union

(ii) Passing union through function

(iii) Pointer to pointer

(iv) Pointer to function ?

Roll No. ..... Total Pages : 04

GSE/D-23 1167

MATHEMATICAL FOUNDATION OF COMPUTER SCIENCE
BCA-CTIS-104

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

1. Explain the following :

(a) Sequences 3

(b) Inverse of a matrix 3

(c) Moments 3

(d) Probability. 3

Unit I

2. Discuss the following with example : 12

(i) Equivalence Relations

(ii) Partial Order Relation

(iii) Predicate Logic

(iv) Vector Spaces and Subspaces.

3. (a) Explain Propositions and Logical Operators. **6**

(b) Show that the set $\{(2, 1, 4), (1, -1, 2), (3, 1, -2)\}$ forms a basis of R^3. **6**

Unit II

4. (a) Explain the Hermitian and Skew-Hermitian matrices. **6**

(b) Solve the following linear equations by Cramer's Rule : **6**

$$2x + y + 4z = 12$$
$$4x + 11y - z = 33$$
$$8x - 3y + 2z = 20$$

5. Explain the following : **12**

(i) Graph Isomorphism

(ii) Bipartite Graphs

(iii) Planar Graphs

(iv) Euler's Formula.

Unit III

6. (a) Discuss the various diagrammatic and graphical representation of data. **6**

(b) Calculate the Geometric Mean of the series 10, 110, 120, 50, 52, 80, 37, 60. **6**

7. (a) Calculate the Variance and Standard Deviation for the following data : 6

x :	4	8	11	17	20	24	32
f :	3	5	9	5	4	3	1

(b) Explain the measures of skewness and kurtosis. 6

Unit IV

8. (a) A box contains 10 bulbs out of which 4 are defective. If 3 bulbs are drawn one by one without replacement, find the probability distribution of defective bulbs. 6

(b) Explain Conditional Probability and Bayes' theorem. 6

9. (a) A dice is thrown 4 times. Getting a number more than 2 is considered as success. Find the probability of : 6

(i) Exactly 2 successes

(ii) Less than 2 successes

(iii) At most 2 successes

(iv) More than 2 successes.

(b) Mean and Standard Deviation of chest measurements of 1200 soldiers are 85 cm and 5 cm respectively. How many of them are expected to have their chest exceeding 95 cm assuming the measurement to follow normal pattern ? **6**

Roll No. ..... Total Pages : 02

GSE/D-23 1168

WEB DESIGNING–I

BCA-CTIS-105

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Describe the document structure of HTML.

(b) Write the three main attributes of Form.

(c) List out any *three* components of DHTML.

(d) What is FQDN ? **4×3=12**

Unit I

2. (a) Describe the evolution and history of WWW. **6**

(b) Differentiate web client and web browser. **6**

3. What is search engine ? Describe its benefits. Explain the various types of search tools. **12**

Unit II

4. (a) How can events handled in DHTML ? **6**

(b) Is ISP the same as Wi-Fi ? Explain. **6**

5. (a) Explain the term Dynamic positioning with example. 6

(b) What is web graphic design ? 6

Unit III

6. Write a HTML code to change font, background images and layouts in a document. 12

7. Explain various style elements of HTML with examples. 12

Unit IV

8. Design a horizontal and *two* vertical frames in an HTML document. 12

9. Explain the following terms : 12

   (a) Transitions

   (b) Mouse overs

   (c) Checkboxes

   (d) Form.

Roll No. ..... Total Pages : 03

GSE/D-23 1169

OPERATING SYSTEM

BCA-CTIS-107

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all. Question No. **1** is compulsory. In addition to compulsory question, attempt *four* questions selecting *one* question from each Unit. All questions carry equal marks.

(Compulsory Question)

1. (a) What is an Operating System ? Why is it necessary for a computer system ? **3**

(b) Define a Process and explain the need of the process concept. **3**

(c) Distinguish between Serial and Batch processing Operating Systems. **3**

(d) What do you mean by Thrashing ? **3**

Unit I

2. What is an operating system ? What are various responsibilities of an operating system ? **12**

3. Explain the following :

(a) Time Sharing OS 6

(b) Real Time OS. 6

Unit II

4. Consider the set of 3 Processes whose arrival time and burst time are given below :

Process no.	Arrival time	Priority	Burst time		
			CPU Burst	I/O Burst	CPU Burst
P1	0	2	1	5	3
P2	2	3	3	3	1
P3	3	1	2	3	1

If the CPU Scheduling policy is Priority Scheduling, calculate the average waiting time and average turnaround time. (Lower number means higher priority) **12**

5. What is Process ? Draw a process state transition diagram and explain in detail. **12**

Unit III

6. What are Deadlocks ? Explain the necessary conditions for a Deadlock to occur. How Deadlocks can be detected ? **12**

7. What are various memory management schemes ? Explain fixed and dynamic partitioning. 12

Unit IV

8. What do you mean by Disk Scheduling ? Explain any *two* methods of Scheduling the Disk. 12

9. What is File ? Explain various Access Methods in detail. 12

Roll No. ..... Total Pages : 03

GSE/D-23 1170

LINUX AND SHELL PROGRAMMING
BCA-CTIS-108

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question each from Unit II to Unit V. Unit I is compulsory. All questions carry equal marks.

Unit I

1. Solve the following :
   (a) Linux distribution is based on.....kernel. 2
   (b) "CTRL + ALT + T" is used to..... 2
   (c) List any five linux distributions. 2
   (d) Differentiate between forward and backward processes. 3
   (e) What is an INODE in Linux ? 3

Unit II

2. (a) Explain the basic linux architecture with diagram. 8
   (b) Write the steps to remotely access a linux system. 4

3. (a) Differentiate between Linux operating system and windows operating system. **4**

(b) Write the commands to shut down the linux system (i) immediately (ii) after specific time (iii) Printing the message during shutdown (iv) cancel shutdown. **8**

Unit III

4. (a) Briefly write the use and format of following commands : **4**

(i) rmdir

(ii) pwd

(iii) cd

(iv) cat.

(b) Explain various process states in linux system. **8**

5. (a) Briefly write the use and format of following commands : **4**

(i) rm

(ii) cp

(iii) mv

(iv) su.

(b) What are the regular expressions in linux ? Write any five basic RegEx with their use. **8**

Unit IV

6. (a) What are *three* major file systems in linux ? Explain. **6**

(b) Briefly explain any three process commands. 6

7. (a) Explain the use of "at" and "batch" and "cron" commands with example. 6

(b) Write the commands to "create", "start" and "stop" a process in linux with examples. 6

Unit V

8. (a) What is a shell ? Explain its various types. 5

(b) Write a shell script to find whether the given number is prime or not. 7

9. (a) How to Write Shell Script in Linux ? Is it case sensitive ? 4+1

(b) Write a shell script to find the factorial of given number 5. 7

BCA CTIS 3rd/ Lib

Roll No. ..... Total Pages : 03

GSM/D-23 1172

OBJECT ORIENTED PROGRAMMING USING JAVA

BCA-CTIS-301

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) How and where Java was invented ?

(b) Enlist the various types of assignment statements in Java.

(c) What are the various ways to exit from a loop ?

(d) How can you create array in Java ?

(e) How can you read a string in java ?

(f) Enlist any *three* pre-defined packages in Java.

(g) Differentiate between throw and throws keywords.

(h) State the purpose of multi-threading. **8×1.5=12**

Unit I

2. Explain the concepts of (i) JVM (ii) JDK (iii) Identifiers (iv) Keywords in Java. **12**

3. (a) What are the various data types in Java ? Explain using suitable examples. **6**

   (b) Explain various types of I/O statement in Java using suitable examples. **6**

Unit II

4. Explain various types of looping and branching statements in Java using suitable examples. **12**

5. (a) Explain the concept of various types of constructors in Java with the help of examples. Also discuss how garbage collection is done in Java. **6**

   (b) Write a program in Java to add two matrices. **6**

Unit III

6. Discuss various types of constructors and methods used in String and StringBuffer classes using suitable examples. **12**

7. (a) What is an interface ? How can create and use an interface ? Explain using suitable example. **6**

   (b) What is meant by inheritance ? Explain any *one* type of inheritance in detail. **6**

Unit IV

8. (a) Define an exception called "NoMatchException" that is thrown when a string is not equal to "India". Write a program that uses this exception. **6**

   (b) How can you handle multiple exceptions in a try block ? Explain. **6**

9. Create an Applet to display the sum of the digits and reverse of the input number. The user must input the number. **12**

Roll No. ..... Total Pages : 03

GSM/D-23 **1173**

FUNDAMENTALS OF STORAGE AND DATA CENTRES
BCA-CTIS-302

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all. Q. No. **1** is compulsory. Attempt *four* more questions, selecting *one* question from each Unit. All questions carry equal marks.

1. Answer the following questions in brief :

(a) What is Data ? What are different types of data ?

(b) What are core elements of data centers ?

(c) What is logical block addressing ?

(d) Explain software implementation of RAID in brief.

(e) What are budget constraints for a data center ?

(f) What is CLARiiON storage array ?

Unit I

2. (a) Discuss evolution of storage technology and architecture.

(b) What is Information ? What are key challenges in managing information ? Explain.

3. (a) What are different components of a storage system environment ? Explain each in brief.

(b) What are fundamental laws governing disk performance ? Explain.

Unit II

4. (a) What are different levels of RAID ? Discuss characteristics of Level 4 and Level 5.

(b) What are components of an intelligent storage system ? Explain them in brief.

5. (a) What are Symmetrix storage array ? Explain.

(b) Explain Direct Matrix architecture in brief.

Unit III

6. (a) What is data centre ? Discuss goals of a data centre.

(b) Discuss roles of a data centre in the service provider environment.

7. Write short notes on the following :

(a) Multitier Architecture

(b) Data Centre Architecture.

Unit IV

8. Explain the following while designing a data centre :
   (a) Physical Area
   (b) HVAC cooling system.

9. Explain infrastructure requirements of a data centre in brief. Discuss different safeguards for a data centre.

Roll No. ..... Total Pages : 03

GSM/D-23 **1174**

COMPUTER ORGANIZATION AND ARCHITECTURE

BCA-CTIS-304

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. Explain all of the following :

(a) Logic Gates

(b) RTL

(c) RISC

(d) Input-output interface.

Unit I

2. Explain different types of map methods with examples.

3. Explain NAND and NOR implementation with suitable examples.

Unit II

4. (a) Explain various types of instruction format of basic computers.

   (b) Explain memory reference instruction.

5. (a) Differentiate between direct and indirect addressing modes with suitable examples.

   (b) Explain the following terms :

   (i) Microprogram control

   (ii) Computer register.

Unit III

6. Explain the following terms :

   (a) Bus and Memory Transfer Logic

   (b) Architecture of ALU

   (c) Arithmetic Microoperations

   (d) Logic Microoperations.

7. (a) What do you mean by microoperation ? Explain microprogram sequencer with suitable examples.

   (b) What is control memory ? Explain design and functioning of control memory.

Unit IV

8. (a) What do you mean by addressing mode ? Differentiate between direct and indirect addressing modes.

(b) Differentiate between relative and index addressing mode.

9. (a) What is program interrupt ? Explain various types of interrupt in detail.

(b) What do you mean by CISC ? .Explain various features of CISC architecture.

Roll No. ..... Total Pages : 03

GSM/D-23 1175

PRINCIPLE OF VIRTUALIZATION

BCA-CTIS-305

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What are the Pros and Cons of virtualization ? Discuss.

(b) Write a brief note on virtual machine.

(c) Does hardware virtualization improve performance ? Comment.

(d) What is the difference between virtual disk and physical disk ?

Unit I

2. (a) What are the different types of virtualization ? Explain desktop virtualization.

(b) What is meant by disaster recovery ? How does virtualization help with disaster recovery ? Discuss.

3. (a) What is server consolidation ? How can organizations save money through server consolidation ?

(b) What is meant by I/O virtualization ? List the major advantages of I/O Virtualization.

Unit II

4. (a) What is hardware virtualization ? What are the advantages of it ? What are the different types of it ? Discuss.

(b) How do you configure network connection in virtual machine ? Discuss.

5. (a) What is a virtual disk ? Discuss the steps to setup a virtual disk.

(b) What is a Windows Virtual PC ? What are its key features and system requirements ?

Unit III

6. (a) What is an RD session host server ? How to open remote desktop session Host configuration in Windows Server ? Discuss.

(b) What is difference between configuring and provisioning ? What is provision in VM ? Discuss.

7. (a) What is Remote Desktop Connection client ? What is the difference between RDP and RDC ? Explain.

(b) What you'll need to set up the web client ? How will you publish the Remote Desktop web client ?

Unit IV

8. (a) What is ESXI ? Discuss three port-groups that are configured in ESXI networking.

   (b) What are the different components of vCenter Server instance ? Discuss.

9. (a) What is the utilization of snapshots in VMware ?

   (b) What is vSphere ? Give a brief overview of vSphere functionality.

Roll No. ..... Total Pages : 03

GSM/D-23 1176

SOFTWARE ENGINEERING

BCA-CTIS-307

Time : Three Hours] Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) What is Software Engineering ? **2**

(b) What is Refactoring ? **2**

(c) What is Cohesion ? **2**

(d) Discuss limitations of prototype model. **2**

(e) What is DFD ? **2**

(f) What is Software Configuration Management ? **2**

Unit I

2. Explain the Waterfall model of software development along with its advantages and limitations. **12**

3. Explain Software Crisis with the help of an example. What are the different factors responsible for software crisis ? **12**

Unit II

4. (a) How do you perform Cost Benefit Analysis while developing a Software Project ? **6**

   (b) What are the different risk factors while developing a software ? What are the different categories of risk ? Describe the process of risk management. **6**

5. Who is System Analyst ? What should be the qualities in a System Analyst ? What are the roles and responsibilities if a System Analyst ? **12**

Unit III

6. What is structured analysis in software development ? Explain different tools and diagrams for performing structured analysis. **12**

7. Explain different types of software feasibility analysis techniques. What are the steps for doing feasibility analysis ? **12**

Unit IV

8. Explain different object-oriented design concepts and methodology. **12**

9. (a) What is the difference between information hiding and abstraction ? 6

(b) Explain the concept of functional independence in detail. 6

Roll No. ..... Total Pages : 02

GSM/D-23 1177

NETWORK SECURITY

BCA-CTIS-308

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Differentiate authentication and authorization.

(b) Define threat and vulnerability.

(c) Name the *three* protocols used in IPsec.

(d) List any *three* advantages of IDS. **4×3=12**

Unit I

2. (a) Describe the security features on switches. **6**

(b) What is the difference between threat and attacks ? **6**

3. What are various types of firewall ? Explain each of them in detail. **12**

Unit II

4. (a) What is a worm ? What is the significant difference between a worm and a virus ? **6**

(b) What is the difference between Symmetric and Asymmetric encryption ? 6

5. (a) Explain application attack. How is it different from network attack ? 6

(b) What are common security vulnerabilities threats and attacks ? 6

Unit III

6. (a) Explain the record protocol of SSL protocol. 6

(b) What are the properties that digital signature should have ? 6

7. (a) Differentiate GETVPN and SSLVPN. 6

(b) Write about encryption and decryption. Describe hash function too. 6

Unit IV

8. (a) Describe the challenges of anomaly detection. 6

(b) Describe Network-Based IDS (NIDS). 6

9. Explain host prevention system. 12

Roll No. ..... Total Pages : 03

GSM/D-23 1178

PERSONALITY DEVELOPMENT
BCA-CTIS-310

Time : Three Hours] [Maximum Marks : 40

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. Short answer type questions : **8**

(a) The archetype representing masculine side of females is known as.....

(b) Name any *two* ingredients of group discussion.

(c) What are the *two* major determinants of personality ?

(d) Carl Jung gave the theory of.....

(e) Name any *two* factors that block interpersonal skills.

(f) "The changing of one's behaviour to fulfill a social role" is called.....

(g) Define Resume.

(h) Give the full form of MMPI.

Unit I

2. What do you mean by a deranged personality ? Discuss any *five* causes of a deranged personality. **8**

3. Define Intelligent Listening. Write a detailed note on the principles of effective listening. **8**

Unit II

4. What is role-playing ? Discuss the importance of role play in social behaviour. Illustrate with a case study. **8**

5. Write a note on group dynamics. Which factors should be kept in mind while dealing with the customers, suppliers and the contract workers ? Discuss. **8**

Unit III

6. Define team behaviour. Discuss in detail the factors which determine the successful behaviour for an effective team. **8**

7. Discuss the importance of group discussions in business communication. Give a detailed account of the steps to be taken for to make group discussions effective. **8**

Unit IV

8. How will you prepare yourself for a job interview for the post of a Computer Programmer ? Draft a resume for the purpose. **8**

9. What is the intent and purpose of conducting a job interview ? What are different types of interviews ? Discuss in detail. **8**

BCACTIS 5th Lab.

Roll No. ..... Total Pages : 03

GSQ/D-23 **1179**

CLOUD WEB SERVICES
BCA-CTIS-501(i)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. Answer the following questions in brief : **6×2=12**

(a) What is IaaS ? Explain with suitable examples.

(b) What are advantages of cost utilization tracking ?

(c) What is security in AWS PVC ? Explain.

(d) What is Amazon CloudFront service ? Explain in brief.

(e) What is S3 Glacier storage class ?

(f) What are AWS account information ?

Unit I

2. (a) What is Amazon Web Services ecosystem ? Explain in brief. **6**

(b) What is data strategy of AWS ? Why is it important ? Explain. **6**

3. (a) What is AWS cost management ? Explain its salient features. **6**

(b) What are fundamental laws governing disk performance ? Explain. **6**

Unit II

4. (a) How can you AWS create an account using the AWS management console ? **6**

(b) What is AWS S3 bucket ? Discuss different bucket configuration options. **6**

5. (a) What are AWS security groups ? Explain security groups for application partitioning. **6**

(b) What is Amazon Private Virtual Cloud (PVC) ? Explain its features. **6**

Unit III

6. (a) Discuss access management and security in S3. **6**

(b) What is Amazon EBS ? Explain different data services provided by EBS. **6**

7. (a) What is VLAN ? Explain basics of AWS VLAN. **6**

(b) Explain different AWS network addressing in detail. **6**

Unit IV

8. (a) What is Amazon Relational Database Service (RDS) ? Explain DB instances, DB engine and DB instance classes. **6**

(b) What is Amazon Simple Queue Service (SQS) ? Discuss basic architecture of SQS. **6**

9. Write short notes on the following :

(a) Simple Workflow Service **6**

(b) Monitoring with Cloud Watch **6**

Roll No. ..... Total Pages : 03

GSQ/D-23 1182

LINUX ADMINISTRATION
BCA-CTIS (502) (ii)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

Compulsory Question

1. (a) Discuss the init process in Linux. **3**

(b) What is subnetting ? Discuss. **3**

(c) What are the security risks of NFS ? **3**

(d) Discuss : **3**

(i) FTP

(ii) Finger.

Unit I

2. How can user accounts and groups be created and deleted by system administrator ? Explain using examples. **12**

3. (a) Discuss the Linux file system and explain different Linux supported file systems. 6

(b) Discuss the tools to monitor security in Linux. 6

Unit II

4. (a) Discuss system environment in Linux. How can it be set ? 6

(b) What is the Network-scripts Config File ? How do you configure this file ? Explain. 6

5. (a) How can you setup a network interface card ? Discuss. 6

(b) How can dynamic host configuration protocol be configured ? Explain. 6

Unit III

6. Discuss the network file system. How do you configure NFS server and clients ? Explain. 12

7. How do you configure and start Samba Server ? How can connection be made with a Samba client and with a Windows PC ? Discuss. 12

Unit IV

8. (a) How do you configure a Time Server ? What is the difference between SSH and SCP ? 6

(b) What is the use of xinetd ? How can the xinetd server be configured ? Explain. 6

9. Discuss the various types of DNS servers. How can a primary master server be configured ? Explain. **12**

Roll No. ..... Total Pages : 03

GSQ/D-23 1183

CLOUD SECURITY

BCA-CTIS-504(I)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question each from Unit I to Unit IV. Q. No. **1** is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Difference between IaaS, PaaS, and SaaS.

(b) What is Service Level Agreement (SLA) ? Outline SLA life-cycle.

(c) What are the different secure cloud software requirements and its challenges ?

(d) List the name of five cloud service provider. Who is best among them and why ?

(e) What is meant by data breaches and misconfiguration in cloud security threats ?

(f) Write the characteristics of trusted cloud computing.

(g) What is key management for data encryption ?

(h) Briefly explain disaster recovery benefits of cloud computing. **12**

Unit I

2. Discuss the historic evolution of cloud computing. Write its characteristics. Outline and explain Public Cloud Model. How does it work ? **12**

3. Explain the impact of virtualization in cloud computing. Explain different types of virtualization along with uses. **12**

Unit II

4. Elaborate the issues in cloud security. Discuss different cloud security services in cloud computing. **12**

5. (a) Explain the different components of data security in cloud computing. **6**

   (b) Write the challenges in data privacy and integrity in cloud. Why is it important ? **6**

Unit III

6. How are risks in cloud computing accessed ? Discuss the pillars of risk management in cloud computing. **12**

7. What is security virtualization ? How we provide security management for virtualization in cloud computing ? **12**

Unit IV

8. Discuss the need and lack for cloud security. Explain common cloud security standards. **12**

9. Explain the key elements of a strong cloud security standards. Highlight the future of security in cloud computing. **12**

Roll No. ..... Total Pages : 03

GSQ/D-23 1185

MOBILE APPLICATION DEVELOPMENT
BCA-CTIS-505(I)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) Enlist the design patterns for the limited memory system.

   (b) What are the various location-based services ?

   (c) What are the various types of widgets in Android ?

   (d) What are the various types of layouts in Android ?

   (e) Give some examples of where Android applications may be used.

   (f) What is a content provider ? **6×2=12**

Unit I

2. Describe the framework and tools needed in mobile application development. **12**

3. What is dynamic linking ? Discuss various plugins and rules of thumb for using DLLs using suitable examples. **12**

Unit II

4. (a) Explain the general architecture of an Android application. **6**

   (b) What are the important packages in Android SDK ? **6**

5. (a) Write down the steps to create a basic Android application. **6**

   (b) State major features of the Android platform. **6**

Unit III

6. How multi-platform development can be done in Android ? Explain using suitable examples. **12**

7. What is an Android database class ? Write a program in Android using this database class. **12**

Unit IV

8. How can we access the sensors in Android ? Explain the different sensors that are supported by Android. 12

9. How can we design a UI in Android applications ? Design a UI having multiple layouts. 12

Roll No. ..... Total Pages : 04

GSQ/D-23 1188

E-COMMERCE
BCA-CTIS-507(II)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is B2B e-Commerce ? Illustrate.

(b) What are some common challenges and risks associated with electronic payment methods ?

(c) Explain the difference between EDI and traditional paper-based document exchange.

(d) Write a brief note on legal aspect of e-Commerce.

Unit I

2. (a) Discuss the security measures in place to protect credit and debit card transactions from fraud and unauthorized access.

(b) What are the merits and demerits of e-Commerce over traditional commerce ? Discuss.

3. (a) What is C2C e-Commerce ? Discuss the advantages and potential risks of C2C e-Commerce, including issues related to trust and payment security.

(b) What is Secure Electronic Transaction (SET) ? How does SET ensure the confidentiality of sensitive payment information during online transactions ?

Unit II

4. (a) Explain the concept of Electronic Data Interchange (EDI) in governance and how does it streamlines data exchange between government agencies and businesses.

(b) Describe the various e-Governance applications of the Internet, such as online portals, digital identity management, and e-Voting systems.

5. (a) Differentiate between government-to-business (G2B), business-to-government (B2G), and citizen-to-government (C2G) interactions in the context of e-Governance.

(b) Discuss the strategies employed by traditional department stores to compete in the global e-Commerce market and retain their customer base.

Unit III

6. (a) How has e-Commerce influenced the real estate market ? Discuss the advantages and challenges of buying and selling property online.

   (b) What are the benefits of e-Auctions for businesses and consumers ? Describe the process of implementing eductions and their impact on pricing and competition.

7. (a) What are the key success factors for e-Brokers in the financial industry, and how do they differentiate themselves from traditional brokers ?

   (b) Discuss the factors that influence consumers' choices when purchasing products online in the B2C model.

Unit IV

8. (a) What characterizes a buyer-oriented marketplace and how does it prioritize the interests and demands of buyers ?

   (b) Explain, how have technology and the internet disrupted traditional retail and media models, leading to the emergence of new digital business models ?

9. (a) Explain the concept of an intermediary-oriented marketplace, and how does it act as a facilitator between buyers and suppliers ?

(b) Discuss the current state of the internet and e-Commerce scenario in India, including growth trends and market dynamics.

Roll No. ..... Total Pages : 03

GSQ/D-23 1189

ARTIFICIAL INTELLIGENCE

BCA-CTIS-508(I)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) What is the difference between universal and existential quantifiers ? Illustrate.

(b) Differentiate between admissibility and monotonicity.

(c) Discuss the time and space complexity of breadth first and depth first search.

(d) Discuss the difference between tokenization and stemming in NLP.

Unit I

2. (a) Define Artificial Intelligence and provide a brief overview of its application areas.

(b) What is the difference between modus ponen and modus tollen inference rules ? Illustrate.

3. (a) What is Robinson's resolution principle ? Illustrate its use in proof by refutation.

(b) Discuss the aspect where man outperforms machine and vice-versa.

Unit II

4. (a) What is Expert System ? Discuss the phases of the Expert System life-cycle.

(b) Name and explain the categories of Expert Systems based on their problem-solving approaches.

5. (a) Explain, how can end-users effectively utilize an Expert System to assist with complex decision-making tasks.

(b) Describe the key steps involved in developing an Expert System.

Unit III

6. (a) What is the difference between uninformed and informed search ? Write the algorithm of depth first search and discuss the problems where you can justify the use of depth first search.

(b) Differentiate between data drive search and goal driven search and discuss the factors deciding the direction of the search.

7. (a) What is A* algorithm ? Show that A* is admissible.

(b) What is depth first search with iterative deepening ? What are its merits and demerits ? Discuss.

Unit IV

8. (a) What are the challenges and complexities associated with processing human languages in NLP ?

(b) Explain the concept of robot control and its importance in achieving desired robot behavior.

9. (a) What is speech recognition, and how does it differ from traditional text-based natural language processing ?

(b) What is a mobile robot, and how does it differ from stationary or fixed robots ? Discuss.

Roll No. ..... Total Pages : 02

GSQ/D-23 **1191**

ENTREPRENEURSHIP
BCA-CTIS-SEC-510(T)

Time : Three Hours] [Maximum Marks : 60

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Differentiate between Entrepreneur and Entrepreneurship.

(b) Discuss the need for feasibility plan.

(c) Define small scale industry.

(d) What do you mean by Venture Capital ?

Unit I

2. Explain different characteristics of Entrepreneurship.

3. Discuss different traits that must be possessed by successful Entrepreneur.

Unit II

4. Differentiate between Feasibility Study and Business Plan.

5. Explain various steps involved in the preparation of project report.

Unit III

6. Elaborate the importance of small-scale industries.

7. Explain different challenges and difficulties in availing MSME Schemes.

Unit IV

8. Discuss various central level institutions that support small business enterprises.

9. Write a note on main objectives and functions of Small Industries Development Organization (SIDO).