BCA Ist/ Lib

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NGSE/D-24

PHILOSOPHY

(Human Values and Ethics)

Paper : B23-VAC-111

Time : Three Hours] [Maximum Marks : 35

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

नोट : प्रत्येक इकाई से **एक** प्रश्न का चयन करते हुए, कुल **पाँच** प्रश्नों के उत्तर दीजिए। प्रश्न संख्या 1 अनिवार्य है। सभी प्रश्नों के अंक समान हैं।

Compulsory Question

(अनिवार्य प्रश्न)

1. Objective Type Question :

वस्तुनिष्ठ प्रश्न :

(i) Value-based education helps individuals to :

(a) Memorize complex theories

(b) Develop ethical reasoning and decision-making skills

(c) Focus solely on academic success

(d) Neglect societal responsibilities.

मूल्य-आधारित शिक्षा व्यक्तियों को किसमें मदद करती है?

(अ) जटिल सिद्धांतों को याद रखने में

(ब) नैतिक तर्क और निर्णय लेने के कौशल विकसित करने में

(स) केवल शैक्षणिक सफलता पर ध्यान केंद्रित करने में

(द) सामाजिक जिम्मेदारियों की उपेक्षा करने में।

(ii) Which of this best explains "human values"?

(a) Monetary rewards achieved through effort

(b) Guidelines for respectful and ethical behaviour

(c) Cultural traditions that never change

(d) Rules imposed by governments.

''मानव मूल्यों को इनमें से कौन सबसे अच्छी तरह समझाता है?

(अ) प्रयास द्वारा प्राप्त वित्तीय पुरस्कार

(ब) सम्मानजनक और नैतिक व्यवहार के लिए दिशा निर्देश

(स) ऐसी सांस्कृतिक परंपराएँ जो कभी नहीं बदलतीं

(द) सरकारों द्वारा थोपे गए नियम।

(iii) Which of the following best defines "value"?

(a) A principle that guides behaviour

(b) A method for solving problems

(c) A financial assessment

(d) A technical skill.

''मूल्य'' को निम्न में से कौन सबसे अच्छा परिभाषित करता है?

(अ) एक सिद्धांत जो व्यवहार का मार्गदर्शन करता है

(ब) समस्याओं को हल करने की विधि

(स) एक वित्तीय मूल्यांकन

(द) एक तकनीकी कौशल।

(iv) Which value promotes harmony with nature?

(a) Transparency

(b) Accountability

(c) Sustainability

(d) Inclusiveness.

कौन-सा मूल्य प्रकृति के साथ सामंजस्य को बढ़ावा देता है?

(अ) पारदर्शिता

(ब) उत्तरदायित्व

(स) सततता

(द) समावेशन।

(v) Which human value is emphasized in the concept of Brahmavihara?

(a) Kindness and compassion

(b) Wealth accumulation

(c) Professional success

(d) Power and authority.

ब्रह्मविहार की अवधारणा में किस मानव मूल्य पर जोर दिया गया है?

(अ) दया और करुणा

(ब) धन संचय

(स) पेशेवर सफलता

(द) शक्ति और अधिकार।

(vi) Which ethical theory focuses on maximizing happiness for the greatest number?

(a) Deontology

(b) Virtue Ethics

(c) Utilitarianism

(d) Divine Command Theory.

कौन-सा नैतिक सिद्धांत अधिकतम लोगों के लिए खुशी बढ़ाने पर केंद्रित है?

(अ) कर्तव्यवाद

(ब) सद्गुण नैतिकता

(स) उपयोगितावाद

(द) दैवीय आदेश सिद्धांत।

(vii) Accountability in professional ethics ensures :

(a) Ignoring mistakes made by peers

(b) Accepting responsibility for one's actions

(c) Promoting personal gains

(d) Focusing only on individual performance.

पेशेवर नैतिकता में जवाबदेही क्या सुनिश्चित करती है?

(अ) सहकर्मियों द्वारा की गई गलतियों की अनदेखी करना

(ब) अपने कार्यों के लिए जिम्मेदारी स्वीकार करना

(स) व्यक्तिगत लाभ को बढ़ावा देना

(द) केवल व्यक्तिगत प्रदर्शन पर ध्यान केंद्रित करना।

Descriptive Answer Type Questions.

आत्मनिष्ठ प्रकार के प्रश्न।

UNIT–I (इकाई–I)

2. How do personal values differ from moral values? Provide examples to illustrate.

व्यक्तिगत मूल्यों और नैतिक मूल्यों में क्या अंतर है? उदाहरण देकर समझाएं।

3. Why is value-based education considered necessary in modern society?

आधुनिक समाज में मूल्य-आधारित शिक्षा को आवश्यक क्यों माना जाता है?

UNIT–II (इकाई–II)

4. What is the difference between deontology and utilitarianism? Explain with examples.

परिणाम निरपेक्ष वाद और उपयोगितावाद के बीच क्या अंतर है? उदाहरणों के साथ समझाएं।

5. Describe the concept of Loksangrah in the context of human values and ethics.

मानव मूल्यों और नैतिकता के संदर्भ में लोकसंग्रह की अवधारणा का वर्णन करें।

UNIT–III (इकाई–III)

6. Explain the role of the four Antah-karanas (mind, intellect, ego, and consciousness) in integrated personality development.

समग्र व्यक्तित्व विकास में चार अंत:करण (मन, बुद्धि, अहंकार और चैतन्य) की भूमिका को समझाएं।

7. Discuss the relevance of the three Gunas (Sattva, Rajas, Tamas) in personality analysis.

व्यक्तित्व विश्लेषण में तीन गुणों (सत्व, रजस, तमस) की प्रासंगिकता पर चर्चा करें।

UNIT–IV (इकाई–IV)

8. Define professional values and explain how they influence workplace ethics?

पेशेवर मूल्यों को परिभाषित करें और वे कार्यस्थल नैतिकता को कैसे प्रभावित करते हैं? यह समझाएं।

9. Discuss the importance of accountability and transparency in professional ethics.

पेशेवर नैतिकता में उत्तरदायित्व और पारदर्शिता के महत्व पर चर्चा करें।

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NGSE/D-24

ENGLISH

[English Language and Communication Skills (Level-1)]

Paper : B23-AEC-111

Time : Three Hours] [Maximum Marks : 35

Note : Attempt all questions selecting *one* question from each unit. Question 1 is compulsory.

Compulsory Question

1. Answer the following in about 30 words each :

(a) Define communication and its basic elements.

(b) What is the key difference between verbal and non-verbal communication?

(c) Explain the importance of formal introductions in workplace communication.

(d) What are the common barriers to effective listening?

(e) Define active listening and its significance.

(f) What is note-taking and why is it important?

(g) Define conjunction. (1×7=7)

UNIT–I

2. Elaborate on the different theories of communication with suitable examples.

OR

3. Explain the various types of non-verbal communication and their importance in effective communication. (7)

UNIT–II

4. Discuss the essential elements of workplace communication with examples.

OR

5. How does interpersonal communication affect workplace relationships? Explain with examples. (7)

UNIT–III

6. What are the different types of listening skills? Explain their significance in communication.

OR

7. Explain various barriers to effective listening and suggest ways to overcome them. (7)

UNIT–IV

8. Explain in detail nouns and their types.

OR

9. Fill in each blank with the appropriate part of speech indicated in brackets. Attempt any *seven* :

(a) The _____ cat sleeps on the windowsill. (adjective)

(b) She _____ walks to school every morning. (adverb)

(c) The children played with their _____ in the park. (noun)

(d) _____ friend helped me with the homework. (pronoun)

(e) The tired dog _____ under the tree. (verb)

(f) We met _____ the coffee shop. (preposition)

(g) The sun shines _____ today. (adverb)

(h) The _____ music helped me relax. (adjective)

(i) The children _____ in the playground. (verb)

(j) My sister reads _____. (adverb)

(k) The _____ caught many fish today. (noun)

(l) He spoke _____ during the meeting. (adverb) (7)

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3442

NGSE/D-24

COMPUTER SCIENCE

(Office and Spreadsheet Tools Learning)

Paper : B23-SEC-101

Time : Three Hours] [Maximum Marks : 35

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 the purpose of the taskbar in an operating system?

(b) Give one example of a popular operating system.

(c) What is the function of the "add/remove software" feature in the control panel?

(d) What is meant by hyperlink in MS-Word?

(e) What is meant by sorting data?

(f) Define a slide transition.

(g) What is the primary use of MS-PowerPoint?

(1×7=7)

UNIT–I

2. Explain the role of icons, taskbar, and desktop in enhancing user experience in an operating system. (7)

3. Explain the types of operating systems with examples. (7)

UNIT–II

4. What are macros in word processing? Describe their role in automating repetitive tasks and provide examples of their application. (7)

5. Describe the role of headers and footers in word processing. Provide examples of how they can be customized for different types of documents. (7)

UNIT–III

6. What are the key elements of an electronic spreadsheet? Discuss their roles in spreadsheet functionality. (7)

7. How can you adjust cell height and width in a spreadsheet? Why is this feature important for data presentation? (7)

UNIT–IV

8. Describe the process of creating and enhancing a presentation. Highlight key tools used for formatting and design of PPT. (7)

9. Explain how you can incorporate multimedia elements like audio and video into a presentation to enhance its appeal? (7)

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

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NBCA/D-24

PROBLEM SOLVING THROUGH-C

Paper : B23-CAP-101

(CC-A1)

(BCA)

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) Differentiate between a constant and a variable with example.

(b) Why puts() and gets() are used and how ?

(c) If $x = 12$, find the value of y after the execution of :

(i) $y = x = ++ x$

(ii) $y = x + +$

(d) Explain break statement.

(e) What is an arrays of pointer? (2×5=10)

UNIT–I

2. (a) Why 'C' language is more popular than any other language? 5

(b) Define preprocessor directive #include and # define. 5

3. (a) Describe different format specifiers. 5

(b) Write a program in C language to swap two numbers using third variable. 5

UNIT–II

4. Write note :

(a) Bitwise operators.

(b) Type conversion.

(c) Library function. 4,3,3

5. (a) What is a loop ? Write a program to find sum of 1 to n natural numbers Using for. 5

(b) Write a note on nesting of for loops. 5

UNIT–III

6. (a) What is a one dimensional array of floating point numbers? How space is allocated in memory to an array? 5

(b) Write a program in c language to generate Fibonacci series i.e.,

0, 1, 1, 2, 3, 5, 8, 13, ... 5

7. Differentiate an iterative function call and a recursive function call With example of each. 10

UNIT–IV

8. Explain :

(a) * and & pointer operators. 5

(b) Accessing data elements in an array using pointers. 5

9. (a) How a structure is nested into another structure in C language? 5

(b) Write a program to find sum of all data elements of a one-dimensional array of integers in C-language? 5

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NBCA/D-24

FOUNDATIONS OF COMPUTER SCIENCE

Paper–B23-CAP-102

(CC-B1)

(BCA)

Time : Three Hours] [Maximum Marks : 50

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Question Number 1 is Compulsory. All questions carry equal marks.

Compulsory Question

1. (a) How is Freeware different from Free Software?

(b) What are device drivers?

(c) Compare LAN, MAN and WAN.

(d) What is Anti-Virus? Name any three Anti-Viruses.

(e) What is Rootkit? What are symptoms of Rootkit? (5×2=10)

UNIT–I

2. Discuss various Computer Generations along with their main features. (10)

3. What is the role of memory hierarchy in computer? Explain Internal & External Memories. (10)

UNIT–II

4. What is the role of Input and Output devices in Computer System? Explain different Output Devices. (10)

5. Write Short Notes on following :
   (a) Recycle Bin.
   (b) Control Panel.
   (c) My Computer.
   (d) Start Button. (10)

UNIT–III

6. What is Internet? Discuss its working and uses. (10)

7. (a) What is Web Browser? Why we use them? Name any Five Web Browsers. (5)
   (b) Discuss the working and functions of Web Browsers. (5)

UNIT–IV

8. (a) What is a Physical Computer System Threats? How are these different from Non-Physical threats? (5)
   (b) What is Keyloager? How it works? (5)

9. Why we use Firewall? Discuss its features and types. 10)

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NBCA/D-24

LOGICAL ORGANIZATION OF COMPUTER

(Common With CTIS/DS/AI)

Paper–B23-CAP-103

[BCA-(CC-C1/DS-C1)]

Time : Three Hours] [Maximum Marks : 50

Note : Attempt any *five* questions. Question No. 1 is compulsory. Select *one* question from each Unit. All questions carry equal marks.

Compulsory Question

1. (a) Abbreviate ASCII, EBCDIC, PROM, DMA
   (b) Prove by Induction $(a \times b) \times c = a \times (b \times c)$.
   (c) Make TT and diagram for D-FF.
   (d) Make Half adder and its circuit.

UNIT–I

2. Convert :
   (a) $(13.3)_{10}$ to Binary, Octal and Hexadecimal.
   (b) What is number in Binary and Octal for 2AF7 ?
   (c) $(101011101001)_2$ to Octal and Hexadecimal.
   (d) What is number in Binary and hexadecimal if register stores High Low high low?

3. (a) Write two coding scheme for Weighted code system.

(b) Perform 2's compliment arithmetic.

–31–02 and –19–12.

UNIT–II

4. (a) Define Boolean algebra, differentiate from ordinary algebra and write its postulates.

(b) Solve Using Boolean Algebra.

(i) $x\bar{x}yy + yyzz + zzxx = x\bar{x}yy + yyzz.$

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

(b) Solve using K-Map $Z = \Sigma 0,1,4,5,11 + \Sigma_{\phi}\ 7,10,14,15.$

UNIT–III

6. (a) Make circuit 10 to 4 line encoder.

(b) Make Code Convertor from 8421 to Cyclic.

7. (a) Make Full Adder using NOR Gates.

(b) Explain 2 bit comparator.

UNIT–IV

8. Explain JKFF its problem as Race around and its solution.

9. (a) Make Shift Register to store 1010.

(b) Make Excitation Table of JK FF.

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NBCA/D-24

MATHEMATICAL FOUNDATIONS FOR COMPUTER SCIENCE–I

Paper : B23-CAP-104

(CC-M1)

(BCA)

Time : Three Hours] [Maximum Marks : 20

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

Compulsory Question

1. (a) What is a universal set?

(b) Define the co-factor of an element in a matrix.

(c) Write the formula for finding the arithmetic mean of two numbers a and b.

(d) Find the derivative of $x^3 + 2x$. (4×1=4)

UNIT–I

2. In a group of 60 students, 25 like mathematics, 30 like physics, 15 like both mathematics and physics. Find how many students like :

(a) Only mathematics.

(b) Only physics.

(c) Neither mathematics nor physics. (4)

3. Explain the relationship between the union, intersection, and difference of two sets with examples. (4)

UNIT–II

4. Solve the following system of equations using the matrix method :

$$x + y + z = 6,$$
$$2x - y + z = 3,$$
$$x + 3y - 2z = 4.$$ (4)

5. Explain the process of finding the determinant of a 3×3 matrix using minors and co-factors. (4)

UNIT–III

6. If $a = 5$, $b = 20$, find the A.M., G.M., and H.M. between a and b. Verify the relation H.M. $\leq$ G.M. $\leq$ A.M.. (4)

7. Explain the nature of roots of a quadratic equation based on the discriminant. Provide examples. (4)

UNIT–IV

8. The population of a town grows according to the model $P(t) = 500e^{0.02t}$, where t is the time in years. Find the rate of change of the population at $t = 5$ years. (4)

9. Explain the differentiation of e^x and a^x (where $a > 0$ and $a \neq 1$). Provide examples. (4)

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

GSE/D-24 1056

COMPUTER AND PROGRAMMING FUNDAMENTALS

BCA-111

Time : Three Hours] [Maximum Marks : 80

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) Explain assembly language. How is it different from high level language ? 2

   (b) What is ROM ? Explain its types. 4

   (c) Write a short note on any one printer. 4

   (d) Explain bubble sort. 4

   (e) Define Debugging. What is its need ? 2

Unit I

2. Define Computer. Explain in detail the block diagram of the computer and its various components. 16

3. Explain secondary memory in detail. What are its advantages over primary memory ? Discuss working of hard disk. 16

Unit II

4. (a) Explain the need of software. Explain various types of software. Give examples of each type. 8

   (b) Explain various Input devices. 8

5. (a) Differentiate between multiprocessing and time sharing operating system. 7

   (b) Discuss multi user operating system. 5

   (c) Explain Multiprogramming operating system. 4

Unit III

6. What is Problem Solving ? Explain various methods of problem solving using examples and the areas where each of the methods is suitable. 16

7. (a) Discuss Viruses. How can they be removed from the computer system ? 4

   (b) Explain structured programming. What are its benefits ? 8

   (c) Write a short note on documentation. 4

Unit IV

8. Explain Searching. Explain binary search with proper examples. What are its merits or limitations compared to linear search ? 16

9. Discuss characteristics of a good programming language. Discuss various types of programming languages. 16

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

GSE/D-24 1057

WINDOWS AND PC SOFTWARE

BCA-112

Time : Three Hours] [Maximum Marks : 80

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

1. (a) Write difference in CD and DVD.

(b) What is Scandisk in Window and it use ?

(c) Define Cell and Range in Excel.

(d) Discuss installing web camera.

(e) Write note on Media player of Windows. **20**

Unit I

2. Discuss Windows as an operating system and write its hardware requirements. **15**

3. Write about the following : **15**

(a) Taskbar

(b) Start Menu.

Unit II

4. (a) In context of Windows, discuss accessories.

   (b) How can you create new user and change passwords ? **15**

5. Write a note on Control Panel. **15**

Unit III

6. What are Data types in Excel. **15**

7. Discuss the following : **15**

   (a) Cell formatting

   (b) Different views of worksheet.

Unit IV

8. In context of Excel, discuss the following : **15**

   (i) IF statement with example

   (ii) Chart wizard.

9. (a) Explain use of Macros in Excel.

   (b) Pivot table. **15**

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GSE/D-24 1058

MATHEMATICAL FOUNDATIONS-I

BCA 113

Time : Three Hours] [Maximum Marks : 80

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

1. (a) Define set with example.

(b) What is reflexive relation ?

(c) Write the derivative of $\sin x$ and $\cos x$ with respect to x.

(d) What is the value of $\lim_{y \to 2} \frac{y^2 - 4}{y - 2}$?

(e) Define ordinary differential equation.

(f) What is degree of a differential quation ?

(g) What is the linear differential equation ?

(h) Write *two* applications of differential equations to geometry. **8×2=16**

Unit I

2. Describe how Venn diagrams can be used to visualize the relationships between multiple sets. Illustrate your answer with a specific example involving three sets. **16**

3. (a) In a basket with 5 apples and 3 oranges, how many ways can you choose 3 fruits if at least 1 must be an apple ? **8**

   (b) Explain Lattice with the help of an example. **8**

Unit II

4. How do you use the product rule in calculus ? Compute the derivative of $h(x) = e^{2x} \sin(x)$ using the product rule. **16**

5. What is a limit, and how does it differ from evaluating a function at a specific point ? Why do we need limits to understand the behaviour of functions ? **16**

Unit III

6. In solving differential equations, what is meant by a general solution and a particular solution ? How do initial conditions or boundary conditions play a role in finding a particular solution ? **16**

7. Define an exact differential equation and explain the conditions under which a first-order differential equation is considered exact. **16**

Unit IV

8. What is general solution of ordinary differential equation ? Determine the general solution of the equation : **16**

$$y'' + y = \cos(x).$$

9. Describe the cases when the characteristic equation has real distinct roots, real repeated roots, or complex conjugate roots. How does each case affect the form of the general solution ? **16**

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

GSE/D-24 1059

LOGICAL ORGANIZATION OF COMPUTER-I

BCA-114

Time : Three Hours] [Maximum Marks : 80

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

1. (a) State and Prove DeMorgan's Law.

(b) Make Venn diagram for AND, OR and NOT gates.

(c) Describe the Postulates of Boolean Algebra.

(d) What is an XOR gate ?

(e) What is a Combinational Circuit ?

Unit I

2. (a) Convert the following :

$(10.625)_{10} = (?)_6$ $(70.5)_8 = (?)_{10}$

$(AFD3)_{16} = (?)_2$ $(1234)_5 = (?)_{10}$

(b) Use 2's Complement to solve :

– 42	– 45
+ 30	+ 60

3. (a) Explain Floating Point Representation.

(b) Explain Excess-3 Code.

Unit II

4. (a) Differentiate between Boolean Algebra and Ordinary Algebra.

(b) Solve using Boolean Algebra :

$$(X+Y)(XZ+Z)\overline{(\bar{Y}+XZ)}=\bar{X}YZ.$$

5. (a) Solve using K-map :

$$Z = \Sigma(0, 1, 3, 5, 9, 11, 15) + \phi(2, 13)$$

(b) Explain NOR gate as Universal Gate.

Unit III

6. (a) Write a note on AND-OR-INVERT using example.

(b) Explain Multilevel realization using NAND gates.

7. (a) Implement the following Boolean functioning NAND gate :

$$F = B\ (A + CD) + BC.$$

(b) Draw the circuit of Full Adder.

Unit IV

8. (a) What is Decoder ? Design 5×32 decoder with the help of 3×8 decoders.

   (b) Explain 8421 to Cyclic Code Converter.

9. (a) Design the Comparator.

   (b) Make 4 : 1 Multiplexer.

Roll No. ..... Total Pages : 05

GSE/D-24 1060

COMMUNICATIVE ENGLISH

Time : Three Hours] [Maximum Marks : 80

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

Unit I

1. What message does the author convey in 'What Animals Think of Man' ?

Or

How did Mr. Kumar bring Ranji's luck back to him ?

2. Answer in about **30** words each :

(i) What was the main aim of Gandhiji as a teacher ?

Or

Who was Jowett ? What does Lynd tell us about him ?

(ii) What does Major tell Clover ?

Or

What is Narayan's opinion about the prevailing system of examination ?

(iii) What response did Petrov anticipate from Ivanych ?

Or

What was Vicar's opinion about Foreman's work and his conduct ?

(iv) Give a brief description of Old Bapu's appearance.

Or

Who was Ranji ? Why was he disappointed ?

(v) What did Mr. MacCallum accuse Mr. Macintosh of ?

Or

How does Otto react when he learns that Dr. Kraus is coming to visit them ?

Unit II

3. Read the passage given below and answer the questions that follow :

On his way home he had to pass the clock tower, where he often stopped at Mr. Kumar's Sports Shop, to chat with the owner or look at all the things on the shelves: footballs, cricket balls, badminton rackets, hockey sticks, cricket bats-it was a wonderland where Ranji liked to linger everyday.

Questions :

(i) Where did Ranji often stop ?

(ii) Why did he do so ?

(iii) Why has the Sports shop been described as Wonderland ?

(iv) Who was Mr. Kumar ?

(v) Name the chapter and the writer ?

4. (a) Write an e-Mail to your friend inviting him to spend his vacation with you.

(b) Send a fax to ABC Furniture telling him about the delivery of furniture getting late.

(c) Write a text message to your boss requesting him for a casual leave.

Unit III

5. Do as directed :

(i) I met.....European in the market. (Article)

(ii) .....Ganges is a holy river. (Article)

(iii) My brother is.....S.D.M. (Article)

(iv) He lives.....Mall road. (Preposition)

(v) Divide the cake.....all the boys. (Preposition)

(vi) He is good.....English. (Preposition)

(vii) He.....(sit) in the library at present.

(viii) He.....(go) to temple every Monday.

(ix) One of the boys.....(has/have) fallen sick.

(x) Ten kilometres.....(be) a big distance.

(xi) Do it. (Change the voice)

(xii) He has bought a new car. (Change the voice)

(xiii) He never drinks tea. (tag question)

(xiv) He said to me, 'How are you' ? (Reported speech)

(xv) He is ..... (tall) than any other boy in the class.

(xvi) No girl in the class is as.....(beautiful) as her.

6. Write a paragraph of about **150** words on any of the given topics :

(i) Black Money

(ii) Terrorism

(iii) Social Media

(iv) Women Rights.

Unit IV

7. Write a letter to Superintendent of Police of your District complaining him about the frequent thefts in your area.

Or

Write a letter to the HOD of your Department seeking his permission for visiting Infosys Campus in Bangalore.

8. You have to open a new account in a bank. Write down the conversation that takes place between you and the bank clerk.

Unit V

9. Write down an elaborate note on the functioning and obligations of the PIOS.

10. You have to get the information about the money spent by the Sarpanch for development in your village. Write an application seeking this information from BDO office of your area.

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

GSE/D-24 1061

PROGRAMMING IN C

BCA-116

Time : Three Hours] [Maximum Marks : 80

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) Explain structure of a C Program. Give example also. **4**

(b) Write short notes on operators, operator hierarchy and associativity with suitable examples. **4**

(c) Explain the concept of function in C language with any suitable example. **4**

(d) What is the relationship between array and string ? Explain by giving suitable examples. **4**

Unit I

2. Explain the concept of identifiers and keywords in C language. Discuss different data types supported in C language with suitable examples. **16**

3. Explain various Input/Output functions in C language. Give suitable examples. **16**

Unit II

4. Explain the following concepts in C language with suitable examples : **16**
   (a) Arithmetic expressions and evaluation of arithmetic expressions
   (b) Type casting and conversion.

5. Explain various decision making and branching statements in C language. Give suitable examples. **16**

Unit III

6. Explain various typing of looping control statements in C language along with their purpose, syntax and examples. **16**

7. Explain the following concepts in C language with suitable examples : **16**
   (a) Passing parameters (call by value and call by reference)
   (b) Recursion.

Unit IV

8. Explain auto, register and static storage classes in C language along with their purpose, syntax and examples. **16**

9. What is the significance of arrays ? Explain various types of arrays. Elaborate on the following concepts w.r.t arrays: **16**

(a) Initialization and processing of an array

(b) Passing arrays to function.

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

NBCA/D-24 **3605**

JAVA OOP FOUNDATIONS

Paper–CC–A3 : B23–CAP–301, B23–CTS–301

Time allowed.: 3 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. Attempt all questions:

   (i) Differentiate class and interface.

   (ii) C Name various character streams.

   (iii) Name few applications of object oriented programming.

   (iv) Discuss AWT containers.

   (v) What do you understand by Java String class?

UNIT–I

2. (a) How is JAVA platform independent and portable, justify?

   (b) Define Data Types of JAVA. emphasise on Non–Primitive data types.

3. List various operators used in Java with example.

UNIT–II

4. What is inheritance? Write its types. Explain multiple inheritance with suitable code segments.

5. What is a package? How to access, import a package? Explain with examples.

UNIT–III

6. How Exception handling is done in Java? How to handle it, explain with example?

7. (a) What is File class for file management? Explain with suitable scenarios.

   (b) Write a program to copy the contents of one file to other. Read the names of files as command line arguments.

UNIT–IV

8. Explain event model and its types.

9. (a) Explain AWT class Hierarchy. Illustrate Event Source in detail.

   (b) What is the role of event handling?

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

NBCA/D-24 **3606**

LINUX & SHELL PROGRAMMING

Paper–CC–B3 : B23–CAP–302, B23–CTS–302

Time allowed : 3 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. Attempt all questions: 5×2=10

   (i) Write the following relational expression in Korn shell

   (a) c > = d (b) c < d.

   (ii) Explain 'echo' command in Linux operating system.

   (iii) What is a constant in shell programming? Write ways for declaring constant in shell programming.

   (iv) Name any four salient features of Linux operating system.

   (v) Why vi is a visual editor in Linux operating system?

UNIT–I

2. (a) Give a brief account of hardware requirements for installing Linux. 5

   (b) Give a brief view of shells in Linux operating system. 5

3. Explain the following Linux characteristics:

   (a) Communications 5

   (b) Multitasking in Linux. 5

UNIT–II

4. Write syntax and purpose of following commands: 5×2=10

   (a) st (b) rd

   (c) ps (d) w

   (e) set.

5. (a) Write different types of users in Linux and their role. 5

   (b) Write any four communication oriented commands of Linux. 5

UNIT–III

6. (a) Write different states of a process in Linux. 5

   (b) Define inode and its structure in Linux. 5

7. Explain following Job Control Commands: 5×2=10

   (a) fg (b) jobs

   (c) suspend (d) df

   (e) more.

UNIT–IV

8. (a) Explain any four environment variables used in BASH shell. 5

   (b) How can we run shell script? Give example. 5

9. Write shell script for following:

   (a) Calculate factorial of an integer number. 5

   (b) Display table of a given number. 5

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

NBCA/D-24 **3607**

DATA BASE TECHNOLOGIES

Paper–CC–C3 : B23–CAP–303 / B23–CTS–303

Time allowed : 3 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. Answer the following questions in brief: 4×2½=10

   (i) Write short note on views.

   (ii) What is the purpose of Cartesian product operation in relational algebra?

   (iii) Describe the demerits of hierarchical data model and network data model.

   (iv) Explain various components of DBMS environment.

UNIT–I

2. What is the purpose of mapping between various layers of the 3-tier architecture of DBMS? Explain with the help of suitable examples. 10

3. What do you understand by Database Administrator? Describe the Role and Responsibilities of Database Administrator. 10

UNIT–II

4. Draw and explain the purpose of various symbolic notations used for designing entity–relationship model. Take an example to illustrate. 10

5. Explain the following with examples (with respect to Entity–Relationship Model): 10

   (a) Entity (b) Entity Sets

   (c) Entity Type (d) Type of Attributes.

UNIT–III

6. What do you understand by "complete set of operators" in Relational Algebra? Justify. 10

7. Define Relational Calculus. Explain various types of Relational Calculus. 10

UNIT–IV

8. What is the role of functional dependency during Normalisation of database? State the inference rules for functional dependency. 10

9. Explain the following normal forms along with suitable examples: 10

   (a) 1 NF (b) 2NF

   (c) 3 NF (d) BCNF.

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

NBCA/D-24 **3621**

BASICS OF DATA SCIENCE USING EXCEL

Paper–BCA : CC–M3 : B23–CAP–304

Time Allowed : 3 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. Answer the following questions : 5×2=10

   (a) What is meant by Data science?

   (b) What types of File extensions may be used while importing or exporting a File in and from Excel?

   (c) What is meant by Descriptive statistics?

   (d) Define the mean of a Dataset.

   (e) What is the purpose of the VLOOKUP function in Excel?

UNIT–I

2. (a) How can you use basic functions such as sum, count and average in Excel? Explain using suitable examples. 5

(b) Explain the purpose and use of Sorting and Filtering in Excel using suitable examples. 5

3. What are the various Data types and Formats used in Excel? Explain in detail using suitable examples. 10

UNIT–II

4. Discuss the importance of Visualizing data using charts in Excel. How can you create and customize the charts in Excel? Explain in detail. 10

5. Provide a detailed explanation of Data cleaning techniques, including examples of how to handle missing values, remove duplicates, and correct errors in Excel? 10

UNIT–III

6. What is meant by Predictive models? Explain their purpose and use in detail. Also discuss the various predictive models used in Excel using suitable examples. 10

7. Find the t-test value for the following two sets of values : 7, 2, 9, 8 and 1, 2, 3, 4? Also discuss how it can be implemented in Excel? 10

UNIT–IV

8. Describe the various What-If Analysis tools in Excel using examples of how each tool can be applied in decision-making scenarios? 10

9. What is meant by Correlation and Regression? How these are calculated in Excel? Explain using suitable examples. 10

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

22301

NAEC/D-24

ENGLISH LANGUAGE AND
COMMUNICATION SKILLS LEVEL–3

Paper : B23-AEC-311

Time : Three Hours] [Maximum Marks : 35

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

Compulsory Question

1. (a) Write a short note on summarizing.

(b) Write a short note on Data Interpretation.

(c) Use "bark" as a noun in a sentence.

(d) Make sentences of the following words :
censor, sensor.

(e) Give meanings of the following :
Childlike, childish.

(f) Rearrange the following sentence :
he/hardly/began/stepped out/ when/to rain/had/it

(g) Write a short note on Interview Skills.

UNIT–I

2. Fill in the blanks with appropriate words/phrases :

(a) India will record an increase of 116 percent in Type 1 diabetes cases by 2040, up from 2021. Globally, the number of cases ..... by 106.9 percent.

(b) Making simple changes to your life and making good habits a part of your routine is simpler than it .....

(c) The electricity department will ..... the power for two hours this evening.

(d) The government has ..... many changes to give relief to the common people.

(e) As I stood in the balcony and watched the passerby throw paper out of his car, I was ..... by his behavior.

(f) Making tall promises and not fulfilling them ..... unethical.

(g) You should ..... your mother for your rude behavior.

OR

3. Paraphrase the following passages : (3+4=7)

(a) "Color blindness is a visual defect resulting in the inability to distinguish colors. About 8% of men and 0.5% of women experience some difficulty in color perception. Color blindness is usually an inherited sex-linked characteristic, transmitted through, but recessive in, females" (Columbia Encyclopedia, 2000).

(b) "For over 20 years now biologists have been alarmed that certain populations of amphibians have been declining. These declines have occurred both in areas populated by humans as well as areas seemingly undisturbed by people. However, offering clear proof of the declining numbers of amphibians has been difficult because in most cases there is no reliable data on past population sizes with which to compare recent numbers" (Gitlin, 2001).

UNIT–II

4. Describe the essential components of Presentation Skills.

OR

5. Explain the important ingredients of Interview Skills.

UNIT–III

6. Make sentences of the following :
   (a) feat.
   (b) flee.
   (c) knead.
   (d) lessen.
   (e) mourning.
   (f) pale.
   (g) pour.

OR

7. Write meanings of the following pair of words :
   (a) dual/duel.
   (b) flair/flare.
   (c) gait/gate.

(d) cereal/serial.

(e) chord/cord.

(f) council/counsel.

(g) days/daze.

UNIT–IV

8. Correct the following :

(a) A bouquet of flowers lend colour and fragrance to the room.

(b) Jatin invited him uncle to visit the recording studio where he works.

(c) I need a new pajama.

(d) We saw a beautiful sceneries.

(e) The boy's book's cover is torn.

(f) Swimming is a good exercising.

(g) The happiness of the children was evident.

OR

9. Correct the following :

(a) Its a beautiful day.

(b) One should always wear their seatbelt.

(c) The coffee is my favourite drink in the morning.

(d) She plays piano very well.

(e) The man, who I saw yesterday, was wearing a long hat.

(f) I need a advice.

(g) The patience is a virtue.

C

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

22331

NSEE/D-24

QUANTITATIVE APTITUDE

Paper : B23-SEC-326

Time : Three Hours] [Maximum Marks : 35

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

Compulsory Question

1. (a) A clock is started at noon. Find the angle traced by hour hand at time 10 minutes past 5. (1)

(b) Express a speed of 18 km/hr in meters per second. (1)

(c) Find the simple interest on Rs. 8,000 for 9 months at $16\frac{2}{3}$ % p.a. (1)

(d) A coin is tossed twice. If the second throw results in a head, then a die is thrown. Describe the sample space. (1)

(e) If the mean and median of a distribution are 270 and 220 respectively, then find the mode of the data. (1)

(f) Write the formula to find the angle of a sector of a pie diagram. (1)

(g) Find the value of n if $(n + 3)! = 56\ (n + 1)!$ (1)

UNIT–I

2. (a) Solve the equation :

$$\frac{6x+1}{15} - \frac{2x-4}{7x-16} = \frac{2x-1}{5}. \quad (3.5)$$

(b) Solve : $7^{1+x} + 7^{1-x} = 50$. (3.5)

3. (a) The sum of the ages of a man and his son is 45 years. Five years ago, the product of their ages was four times the man's age at that time. Find their present ages. (3.5)

(b) In every 30 minutes, the time of a watch increases by 3 minutes. If at 5 a.m. the time is correct, then what time will the watch show after 6 hours? (3.5)

UNIT–II

4. (a) A man travelled a distance of 61 km in 9 hours. He travelled partly on foot at the rate of 4 km/hr and partly on bicycle at the rate of 9 km/hr. Find the distance travelled by the man on foot. (3.5)

(b) The speed of a boat in still water is 15 km/hr. It takes thrice as long to go upstream to a point as to return downstream. What is the speed of the stream? (3.5)

5. (a) Two pipes A and B can fill a tank separately in 12 and 36 hours respectively. If both of them are opened together, how much time will it take to fill the tank completely? (3.5)

(b) A completely a piece of work in 3 days, B completes it in 5 days and C takes 10 days to complete the same work. How long will they take to complete the work, if they work together? (3.5)

UNIT–III

6. (a) Find the compound interest on Rs. 24,000 at 15% per annum for $2\frac{1}{3}$ years (3.5)

(b) A, B, C invested Rs. 1,26,000, Rs. 84,000 and 2,10,000 respectively in a partnership business. Find their shares in a profit of Rs. 2,42,000 after a year. (3.5)

7. (a) In a group of people, 50 speak both English and Hindi and 30 people speak English but not Hindi. All the people speak at least one of the two languages. How many people speak English. (3.5)

(b) A tree 12 m high is broken by the wind in such a way that its top touches the ground and makes an angle of 60 degree with the ground. At what height from the bottom the tree is broken by the wind. (3.5)

UNIT–IV

8. (a) In how many ways can 9 examination papers be arranged so that best and worst never come together? (3.5)

(b) A man has 7 friends. In how many ways can he invite one or more of them to a party. (3.5)

9. (a) Calculate the median of the following data :

Marks :	20	9	25	50	40	80
No of Students :	6	4	16	7	8	2

(3.5)

(b) A man with monthly income of Rs. 8,900 plans his budget for a month as given below :

Item	Amount (Rs.)
Food	2600
Clothing	1100
Education	1700
Miscellaneous	2000
Saving	1500

Represent the above data by a bar diagram. (3.5)

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

GSM/D-24 **1062**

OBJECT ORIENTED PROGRAMMING USING C++

BCA-231

Time : Three Hours] [Maximum Marks : 80

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 object and classes in C++ ? 4

(b) What is Data hiding and encapsulation ? 4

(c) Explain formatted I/O operations in C++. 4

(d) Explain this pointer in C++. 4

Unit I

2. (i) Explain static data member and static member function in details. 10

(ii) Explain local class. 6

3. (i) Explain in detail about nested and local class. 8

(ii) How to access members of class and structure in C++ ? 8

Unit II

4. What do you mean by constructor overloading? Explain it with example. **16**

5. Explain the difference between constructor and destructor with suitable example. **16**

Unit III

6. How can you pass parameters to a function by reference and pointers in C++ ? **16**

7. Explain the following : **16**
   (a) Friend class
   (b) Manipulator
   (c) New and delete operator.

Unit IV

8. Explain precedence of operators and associativity rules in C++. **16**

9. Explain various operators in C++ and inline functions in details. **16**

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

GSM/D-24 1063

DATA STRUCTURES

BCA-232

Time : Three Hours] [Maximum Marks : 80

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

(Compulsory Question)

1. (a) Differentiate between field, record, and file.

(b) What do you mean by pattern matching ? Provide an example.

(c) What do you understand by an array ?

(d) How can you traverse a single linked list ?

(e) What is meant by stack ?

(f) State any *two* applications of the queue.

(g) Define Binary tree.

(h) How can you represent a graph using a linked list ? **8×2=16**

Unit I

2. (a) What is meant by the complexity of an algorithm ? How can you find the complexity of an algorithm ? Explain using a suitable example. **8**

   (b) Differentiate between data types and data structures. **8**

3. Explain the procedure of storing strings in computer memory. Also, write an algorithm to match a pattern from a given text. **16**

Unit II

4. (a) What is a sparse matrix ? Discuss various ways to store sparse matrices in computer memory. **8**

   (b) Write an algorithm to Insert an element after a given node in a one-way linked list. **8**

5. Explain various types of arrays along with their representation in computer memory. Write the algorithm for multiplying two matrices. **16**

Unit III

6. Explain the memory representations of queues using both arrays and linked lists. Also, write the algorithm for insertion in a queue using both techniques. **16**

7. Write down the algorithms for converting an infix expression into a postfix expression and evaluate the postfix expression. **16**

Unit IV

8. Write an algorithm for traversing a tree using preorder traversal. Also, explain the same with the help of a suitable example. **16**

9. What do you understand by Multi-graph and Directed graphs ? Explain the sequential memory representation of graphs and write an algorithm to read and write a graph using this representation. **16**

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

GSE/D-24 1064

COMPUTER ARCHITECTURE

BCA-233

Time : Three Hours] [Maximum Marks : 80

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

1. (a) Define Instruction Code.
   (b) What is a Micro Instruction ?
   (c) What is Asynchronous Serial Data Transmission ?
   (d) Define Priority Interrupt.
   (e) Differentiate between RISC and CISC.
   (f) What do you mean by Direct and Indirect Addresses ?
   (g) What is High Impedance State ?
   (h) Define Cache Memory. 2×8=16

Unit I

2. What is a Computer Instruction ? What are the various types of Computer Instruction ? Explain with the help of example. 16

3. (a) Explain, why Computer Registers are used ? Briefly explain each computer register and its use. 8

(b) Explain complete Instruction Cycle with flowchart. 8

Unit II

4. What is Address Sequencing ? Explain Micro Program Sequencer in detail. 16

5. (a) Evaluate the arithmetic statement X = (A + B)* (C + D) using a general register computer with three address, two address and one address instruction format. 8

(b) What do you mean by Bus and Memory Transfer ? Explain with suitable example. 8

Unit III

6. (a) Explain Program Control Instructions with example. 8

(b) What is an Interrupts ? Explain various types of Interrupts. 8

7. What are Addressing Modes ? Explain various types of Addressing Modes in detail. 16

Unit IV

8. (a) Explain Memory Hierarchy and its importance. 8

   (b) Explain Direct Mapping and Set Associative Mapping procedure of Cache Memory. 8

9. What is DMA ? Explain DMA Controller and DMA Transfer in detail. 16

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

GSM/D-24 1065

SOFTWARE ENGINEERING

BCA-234

Time : Three Hours] [Maximum Marks : 80

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

1. (a) Define causes of Software crisis.

(b) Define information gathering tools.

(c) Discuss Alpha and Beta test.

(d) Write merits of Spiral Model.

Unit I

2. Explain Software Engineering as a Paradigm, and explain Waterfall model.

3. Explain various phases in software development process.

Unit II

4. Explain Software requirement Specification, its components and need for SRS.

5. Write characteristic of software configuration management with emphasis on Verification and Validation.

Unit III

6. (a) Define Data Flow diagram for Library System.
   (b) Make E – R Diagram and its symbols.

7. (a) Discuss Cohesion and Coupling.
   (b) Discuss PERT and GANTT Chart.

Unit IV

8. Explain Software estimation in context of COCOMO Model.

9. Explain concept of SQA. Also discuss Risk management.

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

GSM/D-24 **1066**

FUNDAMENTALS OF DATABASE SYSTEM

BCA-235

Time : Three Hours] [Maximum Marks : 80

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

(Compulsory Question)

1. (a) Define data, information and tuple.

(b) Who are database designers and application developers ?

(c) What is the role of mapping in database system architecture ?

(d) Differentiate between physical and logical data independence.

(e) What are strong and weak entity ? Write the symbolic representation.

(f) Differentiate between entity type and entity sets.

(g) What are the properties of a relation ?

(h) Write a note on view. **8×2=16**

Unit I

2. Define database management system. Differentiate between database systems and file system. Write the advantages and disadvantages of DBMS. 16

3. (a) Write the properties of database management system. Explain responsibilities of database administrator.

   (b) Explain the functions and components of database management system. 8+8=16

Unit II

4. Define database instance, database schema and sub-schema. Outline and explain the architecture of Database Management System as proposed by ANSI-SPARC. 16

5. Elaborate the different classifications of database management system. Outline and explain client- server architecture of DBMS. 16

Unit III

6. What are data models ? Write the advantages and disadvantages of record based, objectbased and physical data models. 16

7. (a) What are attributes ? Discuss different types of attribute. State example along with notation. 8

(b) What is relationship role name and recursive relationships ? Write the cardinality ratios of relationship. 8

Unit IV

8. What is network and hierarchical data model ? Discuss the advantages and disadvantages of data model proposed by DBTG in CODASYL. 16

9. (a) What do you mean by Keys ? Explain different types of keys. 8

(b) What are relational constraints ? Discuss different types of constraints with examples. 8

Roll No. ..... Total Pages : 05

GSM/D-24 1067

COMPUTER ORIENTED NUMERICAL METHODS

BCA-236

Time : Three Hours] [Maximum Marks : 80

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) Determine absolute error, relative error and percentage error in a calculation 24.13 is the actual value and 25.09 is the measured value. 3

   (b) What is difference between floating point number and decimal ? 3

   (c) Estimate the initial approximate root x_0 of equation $f(x) = x^2 - 4x - 2 = 0$ using iterative method ? 3

   (d) What are III-conditioned equations system ? Give a 2×2 system of equations as a example ? 3

(e) Find relation between $\triangle$(Del) and E(shift) operators for interpolations ? 2

(f) What are three common pitfalls in numerical diffentiation ? 2

Unit I

2. (a) Use bisection method for equation $x^3 - 5x - 4 = 0$ for three iterations. 8

(b) Use false position method to find the positive root of $x^3 - 4x - 9 = 0$. Compute upto 4 iterations. 8

3. (a) Use Newton-Raphson iteration method to find a root of the equation $x^3 - x - 1 = 0$ near $x = 1.5$ (use upto 4 iterations). 8

(b) Use Bairstow's method to find a root of polynomial $f(x) = x^4 + x^3 + 2x^2 + x + 1 = 0$. 8

Unit II

4. (a) Use Gauss Elimination method to solve :

$$X + 3Y + 8Z = 4$$

$$X + 4Y + 3Z = -2$$

$$X + 3Y + 4Z = 1.$$ 8

(b) Solve the following system of equations using Gauss-Seidel iterative method :

$$2x - y = 1$$

$$-x + 2y = 4$$

using successive method starting with (0, 0) as Initial values. **8**

5. (a) Use modified Euler's method to solve :

$dy/dx = x + y^2$; $y(0) = 1$

Taking $h = 0.05$ in the range $0 \leq x \leq 0.10$. **8**

(b) Use Runge-Kutta Method to solve differential equation :

$dy/dx = x + y$; $y(0) = 1$

in the range $0 \leq x \leq 0.2$ taking $h = 0.1$. **8**

Unit III

6. (a) Given the table :

X :	5	10	15	20
Y :	0.08716	0.17365	0.25882	0.34202

Find $y(6)$ using Newton's forward interpolation formula. **8**

(b) Use Newton's Backward interpolation formula to find y when $x = 23.4$ from the following table :

x :	19	20	21	22	23	24	25
y :	91.00	100.25	110.0	120.25	131.0	142.55	154.0

8

7. (a) Use Newton's divided difference formula for unequal interval to find an interpolating polynomial for the data :

x :	0.0	0.5	1.0	2.0
y :	0.00	0.57	1.46	5.05

8

(b) Using Lagrange's interpolation formula, find y for $x = 2$ for the data :

x :	0.0	0.1	0.3
y :	– 0.5	0.0	0.2

8

Unit IV

8. (a) Find $y'(x_0)$ and $y''(x_0)$ at $x = 2.2$ given the following table :

X :	1.4	1.6	1.8	2.0	2.2
Y :	4.0552	4.9530	6.0496	7.3891	9.0250

8

(b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ to five decimal places by Trapezoidal rule where the interval (0, 1) is subdivided into 6 equal parts. 8

9. (a) Use Simpson's 1/3rd rule to evaluate $\int_0^1 x^4\,dx$, considering 6 strips. 8

(b) Use Gaussian quadrature formula of second order to evaluate $\int_1^2 \frac{dx}{x}$. 8

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

GSQ/D-24 1068

WEB DESIGNING FUNDAMENTALS

BCA-351

Time : Three Hours] [Maximum Marks : 80

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

1. (a) What is a Web Browser ? Name any *two* web browsers.

   (b) List *two* key functions of a search engine.

   (c) List *two* key characteristics of a good domain name.

   (d) Why is web hosting important for web publishing ?

   (e) What is the importance of the <title> tag in an HTML document ?

   (f) What is < div> tag ? Describe with example.

   (g) What attributes can be used with the <p> tag ?

   (h) What attributes are commonly used with the <img> tag ? 8×2=16

2. What is a Web Server ? Discuss its basic features. How is it different from web browser ? 16

3. (a) Define URLs. Explain, how URLs direct users to specific web resources. 8

(b) Differentiate between webcasting and traditional broadcasting. 8

Unit II

4. Describe the main steps involved in developing a website from planning to publishing. 16

5. (a) What are the main factors that need to be considered when choosing a web hosting provider ? 8

(b) Describe the role of an Internet Service Provider (ISP) in website development. 8

Unit III

6. (a) Explain the basic structure of an HTML document. 8

(b) Explain, how to include multiple paragraphs in an HTML document and describe its attributes that are used to enhance its functionality. 8

7. (a) Discuss the <a> tag and its attributes, and how to create internal and external link in HTML. 8

(b) What are the different methods for creating layouts in HTML ? 8

Unit IV

8. (a) Explain, how to insert an image in an HTML document. Provide an example of the HTML syntax. 8

   (b) What are colspan and rowspan attributes in HTML tables and how are they used ? 8

9. What are ordered and unordered lists in HTML, and how do they differ in terms of usage ? 16

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

GSQ/D-24 1069

OPERATING SYSTEMS-I

BCA-352

Time : Three Hours] [Maximum Marks : 80

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 multiprogramming and multiprocessing ?

   (b) What are the types of real time system ?

   (c) What is Process ? Differentiate between a process and a program.

   (d) Define System Calls. Explain the various system calls.

   (e) What are necessary conditions for deadlock prevention ?

   (f) What is Paging ? Explain.

   (g) What is IPC ?

   (h) What is internal and external fragmentation ? 8×2=16

Unit I

2. Describe the functions of operating system as a resource manager. What are system calls ? How are they categorized ? **16**

3. (a) Explain the architecture of operating system. **8**

   (b) Differentiate between Time sharing and Real Time operating system. **8**

Unit II

4. Consider a system with one CPU and four jobs. Each job has a burst time, arrival time and priority as given below. Priorities are ranked as 0 (lowest) and 127 (highest) :

Job	Burst Time (Millisecond)	Priority	Arrival Time
J1	6	60	0
J2	8	70	3
J3	7	80	10
J4	3	127	9

Draw Gantt Chart for FCFS, SJF, Non-preemptive Priority, RR (Quantum = 4). What is turn around time, waiting time for each scheduling algorithms and also tell which of the scheduling algorithms is having minimal average waiting time ? **16**

5. How does a machine implement context switch ? Describe a plausible sequence of activities that occur when a timer interrupt results in a context switch. 16

Unit III

6. Discuss Deadlock. Explain the Banker's Algorithm used for deadlock avoidance. How is it confirmed that the system state is safe or unsafe using the safety algorithm ? 16

7. (a) Explain the concept of segmentation. Explain the advantages and disadvantages of segmentation. 8

   (b) Explain fixed portioned memory scheme by giving suitable example. 8

Unit IV

8. What is Thrashing ? How does the system detect thrashing ? Once it is detected, what a system can do to eliminate this problem ? 16

9. What are file systems ? Describe the various mechanisms to improve the performance of file systems. Explain, how crash recovery is implemented in File systems. 16

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

GSQ/D-24 1070

ARTIFICIAL INTELLIGENCE

BCA-353

Time : Three Hours] [Maximum Marks : 80

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 terms in brief : **2×8=16**

(a) What is the need of Mobile Robots ?

(b) Define Turing Test.

(c) Define Searching in AI.

(d) What do you mean by knowledge ?

(e) What are various components of Expert System ?

(f) What are various parts of a Robot ?

(g) Define Artificial Intelligence.

(h) Define Knowledge.

Unit I

2. (a) What can Computer do better than people ? **8**

(b) What is the aim of Artificial Intelligence. **8**

3. Explain various application areas of AI. Explain revised Turing test. 16

Unit II

4. Define Expert System. Describe various components and features of Expert System. 16

5. Explain Mycin and Dendral expert system in brief. 16

Unit III

6. (a) Explain Breadth First Search by using example. 8

   (b) What do you mean by Heuristic function ? 8

7. Write short notes on the following : 16

   (a) Best First Search

   (b) Beam Search.

Unit IV

8. (a) Explain various components of NLP. 8

   (b) Explain various applications of Speech Recognition. 8

9. (a) What is a Robot ? What are the essential characteristics of a Robot ? **8**

(b) What are Goals of NLP ? **8**

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GSQ/D-24 1071

COMPUTER NETWORKS

BCA-354

Time : Three Hours] [Maximum Marks : 80

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. Define the following terms : **8×2=16**

(a) Protocol

(b) Frame

(c) Packet

(d) Segment

(e) Flooding

(f) NIC

(g) Choke Packet

(h) Cable Modem.

Unit I

2. (a) Explain various design issues of layers in network architecture. **10**

(b) Why Network Architecture is organized in layers ? **6**

3. Differentiate between the following :

(a) Connection Oriented *vs.* Connection Less Services 6

(b) Client Server *vs.* Distributed Networking Models 4

(c) Hub *vs.* Switch *vs.* Router. 6

Unit II

4. Describe Modulation and its need. Explain various types of analog modulation techniques in detail. 16

5. (a) How Guided transmission media differs from unguided transmission media ? Which one of the two is most popular and why ? 10

(b) Explain communication satellite media in detail. 6

Unit III

6. Write short notes on the following : 4×4=16

(a) CRC

(b) Hamming code

(c) Bluetooth

(d) VLAN.

7. What do you mean by media access control protocols ? How many types of media access control protocols exists ? Explain any *one* of them in detail. 16

Unit IV

8. Explain Link State Routing in detail. Why LSR is better than DVR ? 16

9. (a) Define Congestion in computer network. Why congestion occurs ? What is the impact on computer network ? How the problem of congestion can be handled in data communication ? **5**

(b) Explain traffic shaping algorithms in detail. **11**

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GSQ/D-24 1072

PROGRAMMING USING VISUAL BASIC

BCA-355

Time : Three Hours] [Maximum Marks : 80

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. Answer the following questions in short : **16**

(a) What is Event Driven Programming Language ?

(b) What is the use of "for next" Statement ?

(c) What is form control in VB ?

(d) Define List box control

(e) Explain while wend statement

(f) How can we declare Multidimensional Arrays ?

(g) Explain Call by Reference method

(h) Dynamic Array.

Unit I

2. What is IDE ? Explain the components of Visual Basic Integrated Development Environment. **16**

3. (a) Differentiate between Visual and Non-Visual Programming.

(b) Explain VB as Object Based Language. 16

Unit II

4. What is forcing variable declaration ? How can we declare a variable ? Explain Scope and lifetime of variables. 16

5. Explain the following : 16

(a) Named and Intrinsic Constants

(b) Relational operators

(c) Types of Variables

(d) Message Box and Input Box.

Unit III

6. What are decision statements in VB ? Explain select-case statement with the help of example. 16

7. Explain the following with suitable example : 16

(a) Do loop

(b) Exit statement

(c) Array of Arrays.

Unit IV

8. (a) What is Procedure and how can we call procedure ? **8**

   (b) How can we pass an array to function in VB ? **8**

9. Write a program in VB to generate Fibonacci Series. **16**

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

GSQ/D-24 1073

MULTIMEDIA TOOLS

Time : Three Hours] [Maximum Marks : 80

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 are the hardware and software requirements for a multimedia system ?

(b) Give a brief introduction of MIDI.

(c) What are the various types of video signals ?

(d) What is JPEG mode ? What are the various JPEG modes ? **4×4=16**

Unit I

2. What are multimedia authoring tools and its features ? Explain the various types of Authoring tools with examples. **16**

3. Explain the following : 4×4=16

(a) Components of multimedia

(b) Presentation tools

(c) Hypertext and Hypermedia

(d) Applications Areas of multimedia.

Unit II

4. What do you understand by analog video standard ? Explain the various analog video standards. 16

5. (a) Explain the following : 8

(i) RGB color model

(ii) CMY color model.

(b) Explain the various popular file formats available. 8

Unit III

6. (a) What is analog audio ? What is the process of digitization of sound ? 8

(b) Differentiate between analog audio and digital audio. Which one is better and why ? 8

7. Explain the following :

(a) Lossless predictive coding 8

(b) DM. 8

Unit IV

8. Explain the following video compression techniques :
   (a) H.261 **8**
   (b) H.263. **8**

9. Explain the various lossless image compression techniques with examples. **16**