Total number of printed pages–4

1 SEM BCA (NCBCS) 1·3 (C)

2022

COMPUTER APPLICATION

Paper : 1·3

(Communicative English)

Full Marks : 75

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Give phonemic transcriptions as per the British R. P. (Received Pronunciation) of the following words : ***(any ten)*** 1×10=10

   dig; dust; big; sing; bite; machine; key; fail; war; loud; fear; hunger; enough; busy; money

2. Give phonemic transcription to distinguish between the words : ***(any three)*** 2×3=6

   (a) thin, tin

   (b) care, dare

Contd.

(c) lift, shift

(d) neat, knit

(e) tour, tear

(f) bad, bed

3. Fill in the blanks in the sentences below using appropriate tense forms of the verbs in brackets : 1×7=7

(a) Last year, I _____ (learn) how to bake bread.

(b) John _____ (watch) TV every night.

(c) I am tired of _____ (work) here.

(d) Bret _____ (run) five miles every day.

(e) Olivia _____ (close) the door behind her.

(f) Tomorrow I _____ (walk) home from school.

(g) He _____ (win) a prize for standing first in the quiz competition.

4. Fill in the blanks with appropriate prepositions : 1×7=7

(a) He is leaving for Delhi _____ 1st February next year.

(b) There is a cow _____ the field.

(c) Don't loiter _____ the street.

(d) The book lies _____ the table.

(e) Did you see Shobha _____ the party ?

(f) I am anxious _____ the result.

(g) He has retired _____ business.

5. Correct the following sentences : 1×7=7

(a) My father knows well to teach English.

(b) We want a new house to live.

(c) I have seen him yesterday.

(d) The hen has lain six eggs.

(e) They discussed about the whole matter.

(f) He is sleeping for two hours.

(g) Rahul went to school despite of having a fever.

6. Write a conversation in direct speech and in not less than **150** words between two friends planning to go for a movie. 8

7. Write a letter to the editor of a newspaper regarding frequent breakdown of electricity. 10

Or

Write a report on 'Need of Co-curricular Activities for Students'.

8. What is group discussion ? What is the difference between group discussion and debate ? 5+5=10

Or

Discuss some of the important points that can be helpful in public speaking. 10

9. Discuss nonverbal communication with special reference to paralinguistic features, haptics and oculesics. 10

Or

Discuss the important characteristics essential for the effective use of telephone.

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1 SEM BCA (NCBCS) 1·4 (C)

2022

COMPUTER APPLICATION

Paper : 1.4

(Digital Design)

Full Marks : 75

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer Question No. **1** *and* ***any four*** *from the rest.*

1. *(a)* *(i)* Convert $(43)_8 = (?)_{10} = (?)_2$ 2+2=4

(ii) Perform $(10110{\cdot}11)_2 \times (101{\cdot}1)_2$ 2

(b) Explain number system. 3

(c) Perform $(54)_{10} - (22)_{10}$ in BCD using 10's complement. 3

(d) Explain min term and max term. 3

2. *(a)* Show that

$$A \oplus B \oplus AB = A + B$$

2

(b) Implement a 16:1 max using 4:1 MUX. 5

(c) Express the following functions in sum of min terms and product of max terms : 4+4=8

(i) $(xy + z)(y + xz)$

(ii) $\overline{B}D + \overline{A}D + BD$

3. *(a)* Write the truth table and logic symbol of a three input OR gate. 3

(b) Simplify the Boolean function using k-map : 4

$f(w, x, y, z) = \sum(1,3,4,5,6,7,9,12,13)$

(c) Implement using only

(i) NAND gates ;

(ii) NOR gates for :

$f(0,1,2,3,8,9,12,13,14)$ 4+4=8

4. *(a)* What is full adder ? Draw the full adder circuit and explain the functioning of the circuit. 5

(b) Discuss the difference between combinational logic and sequential logic. 3

(c) Write down the charactreristic equation of SR flip-flop. 2

(d) Explain JK flip-flop. 5

5. (a) NAND and NOR gates are universal gates. Justify. 3

(b) Explain 3-line to 8-line decoder and also draw the logic diagram. 5

(c) Design a 4 bit synchronous up/down counter using T flip-flops. 7

6. (a) Compare synchronous counter with asynchronous counter. 3

(b) Write a short note on Register. 6

(c) Draw the combinational circuit for the following : 3+3=6

(i) $AB\overline{C} + \overline{A}\overline{B}C + \overline{A}B$

(ii) $A\overline{B} + \overline{A}\overline{B} + ABD$

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1 SEM BCA (CBCS) MATH 1·2

2022

(December)

COMPUTER APPLICATION

Paper : 1·2

(Mathematics–I)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer the following : ***(any five)*** 2×5=10

(a) If $p(x) : x$ is even number and $x \in \{1, 2, 3, 4\}$. Find the truth value of $\forall x\ p(x)$.

(b) What is floor function ?

(c) Find the conjugate of $(6+5i)^2$.

(d) What is order of a matrix ?

(e) Find the median of the following dat sample

2, 7, 4, 8, 9, 10, 6, 12, 14

(f) Evaluate $p(n, n-1)$.

2. Answer the following questions :

(a) Construct a truth table for the followin proposition

$$\sim (p \vee q) \vee (\sim p \wedge \sim q)$$

OR

Show that $p \Rightarrow q \equiv \sim p \vee q$.

(b) Obtain the DNF of $(\sim p \wedge q) \wedge (p \rightarrow q)$. 5

3. Answer the following questions :

(a) If $A = \{-3, 0, 1, 2\}$ and $B = \{1, 2, 3, 4\}$ then find $(A - B) \cup (B - A)$. 2

(b) If R is a relation defined on a set of positive integers such that for all $x, y \in z^+$, xR_y if and only if $x - y$ is divisible by 3. Prove that R is an equivalence relation. 4

OR

If R is an equivalence relation then prove that R^{-1} is an equivalence relation.

(c) Evaluate

$$\lceil 3\cdot 6+\lfloor 2\cdot 4\rfloor\rceil+\lfloor\lceil 4\cdot 2\rceil-\lfloor 3\cdot 5\rfloor\rfloor$$ 4

4. Answer the following questions :

(a) Find the polar form of the complex number $\left(\frac{2+i}{3-i}\right)^2$. 4

(b) Express $\frac{(\cos\theta+i\sin\theta)^8}{(\sin\theta+i\cos\theta)^4}$ in the form $x+iy$. 6

OR

If n is positive integer, prove that

$$(\sqrt{3}+i)^n+(\sqrt{3}-i)^n=2^{n+1}\cos\frac{n\pi}{6}.$$

5. Answer the following questions :

(a) Prove that

$$\begin{vmatrix} 1 & 1 & 1 \\ \alpha & \beta & \gamma \\ \beta\gamma & \gamma\alpha & \alpha\beta \end{vmatrix} = (\alpha - \beta)(\beta - \gamma)(\gamma - \alpha)$$

5

(b) Find the inverse of $\begin{bmatrix} 1 & 2 & 3 \\ 1 & 3 & 3 \\ 1 & 2 & 4 \end{bmatrix}$. 5

OR

Find the rank of the matrix

$$\begin{bmatrix} 1 & 4 & 5 \\ 2 & 6 & 8 \\ 3 & 7 & 22 \end{bmatrix}.$$

6. Answer the following questions :

(a) Three persons enter into car, where there are 5 seats. In how many ways can they take up their seats ? 2

(b) In how many ways can 5 students be arranged in a row from a set of 8 students, if 2 particular students always take the corner seats ? 3

(c) A bag contains four white and two black balls and a second bag contains three of each colour. A bag is selected at random, and a ball is then drawn at random from the bag chosen. What is the probability that the ball drawn is white ? 5

OR

Find the arithmetic mean for the following distribution :

Class	0-10	10-20	20-30	30-40	40-50
Frequency	7	8	20	10	5

Total number of printed pages–4

1 SEM BCA (NCBCS) 1·1 (C)

2022

COMPUTER APPLICATION

Paper : 1·1

(Fundamentals of Computers)

Full Marks : 75

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer the following questions : 1×5=5

(a) Fifth generation computers are based on AI. *(True/False)*

(b) Raw facts or figures are called _____. *(Fill in the blank)*

(c) Why is cellular phone also called as smartphone ?

(d) _____ enables the computers to use telephone line to communicate and connect to the Internet.

(Fill in the blank)

(e) Write down the full form of VLSI.

2. Answer the following questions : ***(any five)*** 3×5=15

(a) How are signed numbers represented in the binary form ?

(b) Differentiate between source code and object code.

(c) What is booting ? Explain.

(d) Differentiate between syntax errors and logical errors.

(e) Define DBMS.

(f) Mention *three* mobile operating systems.

3. (a) Differentiate between impact and non-impact printers. 5

(b) Explain about different types of mouse. 5

(c) What is a data projector? How is it different from a computer screen? 5

(d) Write a short note on the characteristics of a computer. 5

(e) What is a BIOS? Which kind of memory is preferred in it and why? 5

OR

(f) 'Control unit' is the brain of the computer. Justify.

4. (a) Define computer network. Explain the differences between mesh and star topology with proper diagram. 1+6=7

(b) What is computer virus? What are different types of virus? Discuss. 1+6=7

5. Answer the following : ***(any two)*** 8×2=16

(a) What is secondary memory? Explain different types of secondary memory. 1+7=8

(b) What are different types of computer according to the technology used? Explain. 8

Or

Discuss the different types of personal computers.

(c) Discuss the different types of computer language with examples. 8

2022

(December)

COMPUTER APPLICATION

Paper : 1·3

(Digital Design)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer ***any six*** questions : 2×6=12

(a) Define truth table.

(b) Draw the truth table for the following equation :

$$Y = A\left(\overline{B} + \overline{C}\right)$$

(c) Draw NAND based latch.

(d) Substract $(1010)_2$ from $(1111)_2$ using 1's complement method.

(e) Define encoder. Also draw the block diagram of encoder.

(f) Draw EX-OR gate with truth table.

(g) State the differences between combinational circuit and sequential circuit.

2. (a) Design a full adder circuit with basic gates and truth table. 6

(b) Describe a 4 bit parallel in serial out shift register. 6

3. (a) Draw and explain synchronous up counter. 6

(b) What is multiplexer ? Draw and explain four I/P multiplexer. 2+4=6

Or

What is decoder ? Explain BCD to Decimal Decoder. 2+4=6

4. (a) Convert the following : 1×6=6

(i) $(53{\cdot}625)_{10}$ into binary

(ii) $(11001011)_G$ to binary

(iii) $(10111{\cdot}1011)_2$ to decimal

(iv) $(AB2)_{16}$ to octal

(v) $(159{\cdot}Y56)_{10}$ to octal

(vi) $(376)_8$ to binary

(b) Express $Y = A + \overline{B}C$ in 6

(i) Canonical SOP

(ii) Canonical POS

Or

Simplify the expression

$$Y = \sum m\,(1, 3, 5, 8, 9, 11, 15) + d\,(2, 13)$$

5. (a) With the help of logical diagram, explain the working of JK flip-flop. 6

(b) Explain the methods of error detection. 6

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1 SEM BCA (CBCS) CE&PD 1·4

2022

(December)

COMPUTER APPLICATION

Paper : 1·4

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

PART–A

(Communicative English)

Marks : 30

1. What do you mean by term 'Organs of speech' ? What are the three groups of organs of speech ? Mention the different organs in all the three groups. 10

Or

What is active and passive articulators ? What are the different types of consonant sounds in English according to their places of articulation ? Give examples. 10

Contd.

2. Define ***any two*** of the following : $2.5 \times 2 = 5$

(a) Voiceless Sounds

(b) Bilabial Consonants

(c) Oral Sounds

(d) Front Vowels

3. Write short notes on ***any two*** of the following : $5 \times 2 = 10$

(a) Fluency

(b) Appropriateness

(c) Turn taking

(d) Importance of Group Discussion

Or

Imagine that there is an interview for the post of a teacher in a school. The interviewers ask you to tell them about a book that you recently read and liked. Prepare a presentation for it. 10

4. In the following telephone talk, only the first few sentences are given. Imagine the necessary details and develop the conversation. 5

Travel Agent : Hello, how may I help you ?

Caller : I would like to make a flight reservation for the twenty-third of this month.

Travel Agent : Okay. What is your destination ?

Caller : Well. I am flying to Sydney, Australia.

Travel Agent : Okay. Let me check what flights are available ? And when will you be returning ?

Caller : Uh, well, I would like to catch a return flight on the twenty-ninth. And I would like the cheapest flight available.

Travel Agent : Okay. Let me see...

PART–B

(Personality Development)

Marks : 30

1. Answer in brief for the the following : 2×5=10

   (a) Personality

   (b) Terminal Value

Contd.

(c) Self-Development

(d) Behaviour

(e) Ego and Superego

2. Answer ***any two*** from the following :

(a) Describe the stages in development of personality from infancy to maturity. 10

(b) Explain the Big Five model of personality development. 10

(c) Define attitude. Highlight the sources of attitude formation. 2+8=10

(d) Describe the theory developed by Abraham Maslow on hierarchy of needs. 10

1 SEM BCA (CBCS) PwC 1·5

2022

(December)

COMPUTER APPLICATION

Paper : 1·5

(Programming with C)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Give very brief answer to each question :

   (a) What is the size of the char and float data type ? 2

   (b) Write the difference between a++ and ++a with an example. What will be the output of a++ and ++a if a = 5 ? 1+1=2

   (c) Write one difference between auto and static variables. 2

(d) How is dynamic memory allocated ? Give *one* example. 1+1=2

(e) Differentiate between an extern and a local variable with an example. 2

2. Answer the following :

(a) Compare between call by value and call by reference in C programming with an example. 5

(b) Draw a flowchart to find the largest of *two* numbers. 5

(c) What are the *three* different loops available in C ? Describe with a proper example. 1+4=5

(d) What is an array ? What are the advantages and disadvantages of arrays ? 1+4=5

3. Answer ***any three*** from the following : 10×3=30

(a) W.A.P to enter *n* students' details using the structure and print them.

(b) W.A.P to calculate the sum of all the elements in a 2D matrix using function.

(c) W.A.P in C to print all the factors of a given number.

(d) W.A.P. in C to check whether a user-entered positive integer is prime or not.

(e) Write the step-by-step process to find the address of an index in a 2D array if row-major ordering is used.
