

Total No. of Printed Pages—16

X/17/CSc

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COMPUTER SCIENCE

(CANDIDATES WITH PRACTICAL/INTERNAL ASSESSMENT)

Full Marks : 80

Pass Marks : 24

(CANDIDATES WITHOUT PRACTICAL/INTERNAL ASSESSMENT)

Full Marks : 100

Pass Marks : 30

Time : 3 hours

(For Both Categories of Candidates)

The figures in the margin indicate full marks for the questions

SECTION—A

(COMPUTER FUNDAMENTALS)

(*Maximum Marks : 20*)

(Objective-type Questions)

I. Choose and write the correct answer for the following
(any *three*) : 1×3=3

1. Which of the following is the best example of non-positional number system?
 - (a) Decimal number system
 - (b) Octal number system
 - (c) Roman number system
 - (d) Binary number system

(2)

2. The Boolean expression $\overline{A \cdot B}$ is represented by
- (a) NOT gate
 - (b) NOR gate
 - (c) NAND gate
 - (d) None of the above
3. The equivalent octal number of decimal number 25 is
- (a) 4
 - (b) 3
 - (c) 32
 - (d) 31
4. In hexadecimal number system, B stands for
- (a) 11
 - (b) 10
 - (c) 12
 - (d) 13
5. What is the product of $(10110)_2 \cdot (101)_2$?
- (a) $(10011010)_2$
 - (b) $(1010110)_2$
 - (c) $(1101110)_2$
 - (d) $(10001110)_2$

(3)

6. The number of bits that EBCDIC uses to encode each character is

- (a) 16 bits
- (b) 8 bits
- (c) 2 bits
- (d) 10 bits

II. State whether the following statements are *True* or *False*
(any *two*) : 1×2=2

1. The octal and hexadecimal systems have more than two states.
2. The summary of OR operator is at least one condition should be true for the compound condition to be true.
3. A byte is a string of 8 bits.
4. The hierarchy of Boolean operations cannot be changed by using parenthesis.

III. Fill in the blanks in the following sentences (any *two*) : 1×2=2

1. The radix of the binary number is ____.
2. ____ gates are electronic circuits that implement the Boolean operations.
3. ____ gives the truth or falsity of the compound proposition.
4. One's complement of binary number 10111 is ____.

(4)

(Short Answer-type Questions)

IV. Answer the following : 1×3=3

1. Define nibble.
2. Define word associated with binary digits.
3. Give the Boolean expression of AND gate with two inputs.

(Descriptive-type Questions)

V. *Either*

- (a) (i) How are the non-numeric characters stored in the computer? 1
- (ii) What are OR and NOR gates? Write their truth tables. 2+2=4

Or

- (b) (i) What is meant by the base of a number system? 1
- (ii) Subtract $(1111101)_2$ $(1010110)_2$ using 2's complementary method. 2
- (iii) Convert the following : 2
- $(5321)_6$ $(?)_{10}$

VI. *Either*

- (a) (i) Calculate the following : 2
- $(11101011)_2$ $(101)_2$

(5)

- (ii) Draw the logic circuit for the following : 3

$$Y = (A \cdot B) + (\bar{A} \cdot B) + (A \cdot \bar{B})$$

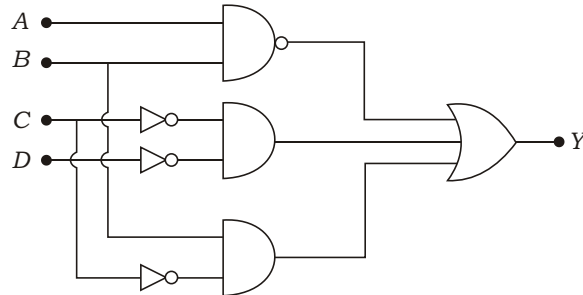
[For the Visually Handicapped (Blind) Students only
in lieu of Question No. VI. (a) (ii) above]

- (ii) What are the three rules for subtraction using 1's complement method? 1+1+1=3

Or

- (b) (i) What is an ASCII code? What is its extended version? 2

- (ii) Write the Boolean expression of the following logic circuit : 3



[For the Visually Handicapped (Blind) Students only
in lieu of Question No. VI. (b) (ii) above]

- (ii) What is Boolean algebra? Who developed it? Name the person who realized its use in computer. 1+1+1=3

(6)

SECTION—B

(**ADVANCED DOS**)

(*Maximum Marks* : 20)

(Objective-type Questions)

I. Choose and write the correct answer for the following
(any two) : 1×2=2

1. Which of the following commands is not an external DOS command?

- (a) FORMAT
- (b) DEL
- (c) DISCOMP
- (d) DISKCOPY

2. The MEM command

- (a) loads a TSR software
- (b) loads the mouse driver software in reserved memory
- (c) displays the amount of used and free memory of the computer
- (d) All of the above

(7)

3. Which of the following commands is used to display the screen ON or OFF during batch file operation?

(a) DISPLAY

(b) REM

(c) VOL

(d) ECHO

4. The purpose of FORMAT command is to

(a) prepare a floppy disk for use with MS-DOS

(b) create a new root directory and file allocation table for the disk

(c) locate and mark all bad sectors on a disk

(d) All of the above

II. Write *True* or *False* for the following statements (any *two*) :

1×2=2

1. DIR/O:e lists in reversed alphabetic order of file extension.
2. Switch /Y in DELTREE command is used to suppress the prompt for confirmation before the deletion.
3. In DOSKEY command /HISTORY is used to list all the commands presently stored in buffer.
4. The external commands are less powerful and organising than internal commands.

(8)

III. Fill in the blanks in the following sentences (any *two*) : 1×2=2

1. The _____ command is used to transfer the system files IO.SYS, MS-DOS.SYS and COMMAND.COM to a disk to make it bootable.
2. _____ makes a verbatim copy of one removable disk to another disk.
3. _____ command is used for backing up the data into a separate disk for safe keeping.
4. The _____ command is used to detect, diagnose and correct the errors on the disk surface.

(Short Answer-type Questions)

IV. Write the commands and their switches for the following (any *two*) : 2×2=4

1. To delete all the files with extension .TXT of the current directory, with the option to confirm before each one is deleted
2. To move all the files from current directory to the C:\TEMP directory
3. To check the current disk and fix the errors
4. To display all the lines containing the string "EXAM" in the file C:\CLASS X\BOARD.TXT

(9)

(Descriptive-type Questions)

V. *Either*

- (a) What is the use of ATTRIB command? What are the options available with ATTRIB command? 5

Or

- (b) (i) What is the purpose of REPLACE command? 1
(ii) Differentiate between LABEL and VOL commands with their syntaxes. 2+2=4

VI. *Either*

- (a) (i) What is a batch file? 1
(ii) (1) Write a short note on DEFRAG command. 2
(2) What is the purpose of PAUSE command in a batch file? 1
(3) What is the purpose of REM command in a batch file? 1

Or

- (b) Create a single batch file MEGHA.BAT to execute the following : $\frac{1}{2}+1+1+1+1+\frac{1}{2}=5$
(i) To clear the screen
(ii) To display the message "Good Morning"
(iii) To copy all the files with extension .DOC from C:\TEMP to a floppy disk
(iv) To remove the directory C:\TEMP and all its subdirectories and files attached to it

(10)

SECTION—C

(QBasic)

(Maximum Marks : 40)

(Objective-type Questions)

I. Choose and write the correct answer for the following
(any three) : 1×3=3

1. Which one of the following is valid integer variable?

- (a) AGE%
- (b) AGE!
- (c) AGE#
- (d) AGE&

2. The library function that returns the absolute value of the argument is

- (a) ASC
- (b) INT
- (c) ABS
- (d) CHR

3. The QBasic expression of $x^{(B \ C)} \ y^{(D \ E)}$ is

- (a) $x^b \ x^c \ Y^D \ Y^E$
- (b) $xy^{(b \ c)(D \ E)}$
- (c) $x \ (B \ C) \ y \ (D \ E)$
- (d) $(x \ B \ x \ C) \ (Y \ D \ Y \ E)$

(11)

4. READ statement in a QBasic program should be always associated with
 - (a) INPUT
 - (b) DIM
 - (c) LET
 - (d) DATA
5. To move the cursor to a specific position in a particular line, which of the following functions is used?
 - (a) USR
 - (b) TAB
 - (c) PRINT
 - (d) RND
6. To extract any portion of a string in QBasic, one would use
 - (a) MID\$
 - (b) LEFT\$
 - (c) RIGHT\$
 - (d) STRING\$

II. State whether the following statements are *True* or *False*
(any *three*) : 1×3=3

1. Speed# is an example of double-precision variable.
2. The DO-WHILE loop structure repeatedly executes the statement block as long as the condition remains true.

(12)

3. LCASE\$ converts all lowercase characters to capital letters.
4. The output of the expression PRINT USING "!&"; "MBOSE", "EXAM" is M EXAM.
5. The EXIT statement allows you to exit prematurely from a block of statements in a control structure, from a loop or even from a procedure.
6. The FIELD statement allocates space for a variable in random access file buffer.

III. Fill in the blanks in the following sentences (any *three*) : 1×3=3

1. ____ is a graphical representation of the algorithm.
2. The ____ operator gives the remainder when the first operand is divided by the second operand.
3. The ____ statement sets the file position for the next read or write operation.
4. The ____ clause will be executed if none of the previous expressions is true.
5. The ____ loop requires to know how many times the statements in the loop will be executed.
6. DIM and ____ usually provide a better way to specify whether arrays are static or dynamic.

(13)

IV. Answer the following questions :

1×3=3

1. Identify the following QBasic number :

3.56E + 6

2. Write the QBasic expression of

$(a - b)^2 - a^2 - 2ab - b^2$

3. Write the syntax to rename TEMP.DAT to INFO.DAT.

(Short Answer-type Questions)

V. Answer the following questions within 2 or 3 sentences or steps :

2×4=8

1. What is NESTED IF structure?
2. What is dynamic array? Give example.
3. Explain SELECT-CASE with syntax.
4. Distinguish between sequential file and random file.

(Descriptive-type Questions)

VI. Answer the following questions :

5×4=20

1. *Either*

(a) What are variables? Enumerate any four rules for naming variable in QBasic. 1+4=5

Or

(b) Distinguish between STRING\$ and INSTR functions. 2½+2½=5

(14)

2. *Either*

- (a) Write the output generated by the following program : 5

```
DIM X AS INTEGER
FOR X = 1 TO 5
    PRINT X; "to the power of 3 ="; X ^ 3
NEXT X
END
```

Or

- (b) Develop QBasic codes to generate the following pattern : 5

3. *Either*

- (a) Write a QBasic program to calculate the largest of three integers. 5

Or

- (b) Write a program to check whether a string is a palindrome or not. 5

4. *Either*

- (a) Create a sequential file to store the students name, marks in computer theory and marks in computer practical. 5

(15)

Or

- (b) (i) What are the advantages of a binary data file? 1
(ii) State the differences between LSET and RSET.
Why do we need them? 3+1=4

[For Private Candidates only (without Practical)]

(Maximum Marks : 20)

VII. Answer the following questions within 2 or 3 sentences each
(any five) : 2×5=10

1. What is the purpose of WRITE# statement? 2
2. Distinguish between input screen and output screen. 1+1=2
3. Differentiate between interpreter and compiler. 1+1=2
4. What is the use of KILL statement? Write its syntax. 1+1=2
5. What are the purposes of LET and INPUT statements? 1+1=2
6. Write about the scope of a variable. 2

VIII. Answer the following questions : 5×2=10

1. *Either*
(a) Write a program to add the first fifty even natural numbers by using DO WHILE loop. 5
Or
(b) How is a dynamic array different from a static array? Give example. 5

(16)

2. *Either*

- (a) Write a program to enter the length and breadth of a rectangle and calculate its area. 5

Or

- (b) Identify the following QBasic constants and variables : 1×5=5

(i) NAM\$

(ii) "786"

(iii) AGE%

(iv) SCOREBOARD!

(v) CRICKETSCORE#
