Total No. of Printed Pages—16

**X/13/CSc**

**2 0 1 3**

# 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 number systems has the smallest base or radix?
   *(a)* Octal
   *(b)* Binary
   *(c)* Decimal
   *(d)* Roman

2. Which one of the following Boolean expressions represents the NAND operation?

   *(a)* $\overline{A}\ \overline{B}$

   *(b)* $\overline{A\ B}$

   *(c)* $\overline{A\ B}$

   *(d)* $\overline{A}\ \overline{B}$

3. Which operator from the following acts on a single operand?

   *(a)* NOT

   *(b)* OR

   *(c)* AND

   *(d)* NAND

4. If the octal number is 65, then what is the equivalent binary number?

   *(a)* $(100011)_2$

   *(b)* $(101110)_2$

   *(c)* $(110101)_2$

   *(d)* $(111101)_2$

5. What is the product of $(10110)_2$ $(101)_2$?

   *(a)* $(10011010)_2$

   *(b)* $(10101101)_2$

   *(c)* $(11011010)_2$

   *(d)* $(10001110)_2$

   *(e)* $(1101110)_2$

6. Which of the following operations has the highest precedence when an expression contains a combination of OR, AND and NOT operations?

   *(a)* AND operation

   *(b)* OR operation

   *(c)* NOT operation

   *(d)* None of the above

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

1. Any value expressed in binary number system should have combination of only '0' and '1'.

2. The octal equivalent of the decimal number 100 is 144.

3. Every character in the computer is encoded as bits.

4. In the NOR gate, the output is true if all the inputs are false.

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

1. The —— operator is also known as complementation.

2. BCD-6 bit version can encode up to —— characters.

3. If the number is $(42)_6$, then the equivalent decimal number is ——.

4. If the hexadecimal number is A4, then equivalent binary number is ——.

( SHORT ANSWER-TYPE QUESTIONS )

**IV.** Answer the following : 1×3=3

1. Define binary data.

2. Convert the following :

$(10\ 101)_2 \quad (?)_{10}$

3. Give the truth table of an NOR gate.

( DESCRIPTIVE-TYPE QUESTIONS )

**V.** *Either*

*(a)* *(i)* Explain briefly the OR operation and give its truth table. 1+1=2

*(ii)* Differentiate between positional and non-positional number systems with examples. 1+1+1=3

*Or*

*(b)* *(i)* What do you understand by octal number? 1

*(ii)* Convert the following : 2

$(321)_4 \quad (?)_9$

*(iii)* Subtract the following using 2's complement method : 2

$(101001)_2 \quad (1000100)_2$

**VI.** *Either*

*(a)* *(i)* Define binary number system. Why is it used in computer? 1+1=2

*(ii)* Draw the logic circuit of the following : 3

$A \quad (x \quad y \quad \overline{z}) \; (x \quad \overline{y \quad z}) \; (\overline{x \quad y \quad z})$

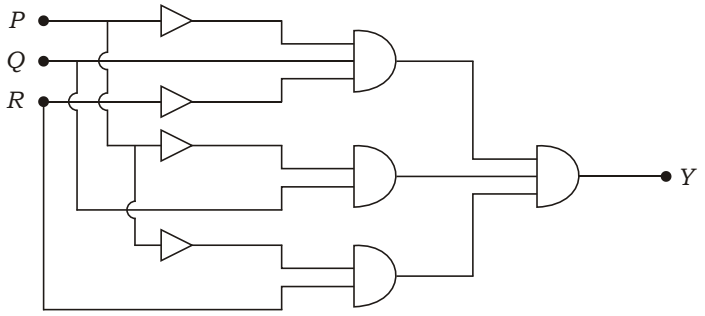
**[ For the Visually Handicapped (Blind) Students only in lieu of the above Question No. VI. *(a) (ii)* ]**

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

*Or*

*(b)* *(i)* What is meant by the base of a number system? Give an example. 1+1=2

*(ii)* Give the Boolean expression of the following logic circuit : 3




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

*(ii)* Explain AND gate with logical symbol and give its truth table. 1+1+1=3

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 one of the following commands is used to delete files from the secondary storage medium?

   *(a)* DELTREE

   *(b)* DEL

   *(c)* RD

   *(d)* DELETE

2. Which one of the following commands is used to display the disk volume label?

   *(a)* LABEL

   *(b)* LIST

   *(c)* VOL

   *(d)* MEM

3. Which one of the following commands provides information about the total memory of the computer?

   *(a)* CHKDSK

   *(b)* DOSKEY

   *(c)* MEM

   *(d)* DIR/S

4. Which one of the following commands stores all DOS commands typed from the DOS prompt into the memory buffer?

   *(a)* DOSKEY

   *(b)* MSBACKUP

   *(c)* DEFRAG

   *(d)* MORE

**II.** Write *True* or *False* for the following statements (any *two*) : 1×2=2

1. The DIR command lists out all the subdirectories and files of a given directory.

2. The process in which files are written on a disk in parts is known as 'defragmentation'.

3. Volume label is a name given to the disk for easy identification.

4. The order of execution of command files are .BAT, .COM and .EXE.

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

1. —— makes a verbatim copy of one removable disk to another disk.

2. —— lists five files or directory names per line on the screen.

3. The —— command creates a new root directory and file allocation table for the disk.

4. —— displays the attributes of all files in the current directory.

( SHORT ANSWER-TYPE QUESTIONS )

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

1. Change the attribute of file 'EXAM2013.TXT' in C: to read only.

2. Redirect all the commands presently stored in the buffer to a file 'compdoc.txt'.

3. Format the floppy drive and put the volume label BOARDEXAM.

4. Copy all the information of the disk A: to B: and also verify if the information is copied correctly.

( DESCRIPTIVE-TYPE QUESTIONS )

**V.** *Either*

*(a)* *(i)* What is the purpose of DEFRAG command? 1

*(ii)* Differentiate between REPLACE and MOVE commands with their syntaxes. 2+2=4

*Or*

*(b)* *(i)* What is the purpose of SYS command? 1

*(ii)* Write short notes on the following : 2+2=4

(1) MEM command

(2) ATTRIB command

**VI.** *Either*

*(a)* Explain, in detail, the FORMAT command with syntax and its various switches. 2+1+2=5

*Or*

*(b)* Create a batch file called MYFILE.BAT to execute the following : 2+1+2=5

*(i)* List the contents of the current directory in the order of names.

*(ii)* List the amount of free memory.

*(iii)* Display all the lines containing the string 'Exam' in the file C:\MISC\Computer.doc.

## 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 of the following characters in QBasic is used to declare a variable as a long integer?

   *(a)* !

   *(b)* %

   *(c)* &

   *(d)* #

2. Which one of the following is *not* a relational operator?

   *(a)* =

   *(b)* ^

   *(c)* <

   *(d)* >

3. Which one of the following statements allows you to control both the line and the column?

   *(a)* LOCATE

   *(b)* TAB

   *(c)* SPC

   *(d)* SPACE$

4. Which one of the following is known as in-built function?

   *(a)* FUNCTION-END FUNCTION

   *(b)* LIBRARY FUNCTION

   *(c)* DEF-FN

   *(d)* SUBROUTINE

5. Which one of the following statements reserves the amount of space in contiguous memory location?

   *(a)* Subprogram

   *(b)* Sequential file

   *(c)* Array

   *(d)* Global variable

6. Which one of the following functions is needed while reading a random access data file?

   *(a)* EOF()

   *(b)* LOC()

   *(c)* SEEK()

   *(d)* LOF()

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

1. Escape key is not a part of QBasic character set.

2. The variable name in QBasic can be 1 to 80 characters in length.

3. QBasic does not make any distinction between upper-case and lower-case characters.

4. The statement MID$("Shillong", 2, 4) will return Shil.

5. When function is defined by DEF-FN statement, we are not taken into a separate window.

6. In sequential file, data is usually stored in the form of records.

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

1. In an expression *a* *b*, *a* and *b* are the operands and + is the ——.

2. In PRINT USING, the character —— is used to print only the first character of the string.

3. The array ArMark (5, 3, 4) can store —— elements.

4. The global variable has to be defined by the —— keyword.

5. —— statement specifies values to be read by READ statements.

6. In sequential access, a file is created in —— mode.

**IV.** Answer the following questions : 1×3=3

1. What is the purpose of RESTORE statement?

2. Write the QBasic expression of $x^{b\ c}\ \ y^{d\ e}$.

3. Explain briefly the FIX library function.

( SHORT ANSWER-TYPE QUESTIONS )

**V.** Answer the following questions within *2* or *3* sentences or steps : 2×4=8

1. What is INPUT statement? Write its syntax.

2. Explain SWAP statement with syntax.

3. How is LINE INPUT# different from INPUT# in a sequential data file?

4. What are KILL statement and NAME o$ as n$ statement?

( DESCRIPTIVE-TYPE QUESTIONS )

**VI.** Answer the following questions : 5×4=20

1. *Either*

*(a)* Explain the IF structure. Discuss its various syntaxes with example. 1+2+2=5

*Or*

*(b)* Distinguish between ABS and SGN functions. Give examples to illustrate your answer. 2½+2½=5

2. *Either*

*(a)* Write the output generated by the following QBasic program : 1×5=5

```
DIM A AS INTEGER
DIM B AS INTEGER
CLS
A = 101
DO WHILE A <= 105
    IF (A MOD 2) = 1 THEN
        B = B + 100
      ELSE
        B = B – 10
    END IF
PRINT B,
A = A + 1
LOOP
END
```

*Or*

*(b)* Develop QBasic codes to generate the following output using nested FOR-NEXT loop : 5

```
1
1  2
1  2  3
1  2  3  4
1  2  3  4  5
```

3. *Either*

*(a)* Write a program to calculate the average of a set of numbers given by the user. The user should be allowed to input numbers as long as he/she wants. 5

*Or*

*(b)* Write a program to calculate the sum of a Fibonacci series up to given number of terms. The Fibonacci numbers should be generated in a function and summing should be done in the main program.

4. *Either*

*(a)* *(i)* What do you understand by sequential access? 1

*(ii)* Distinguish between PRINT# and WRITE# statements. 2+2=4

*Or*

*(b)* Create a sequential file to store the vehicle's name, registration number, company's name, owner's name and year of manufacture. 5

**[ For Private Candidates only (without Practical) ]**

( *Maximum Marks* : 20 )

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

1. What are various arithmetic operators available in QBasic? 2

2. Explain TAB statement with syntax. 1+1=2

3. What do you mean by Nested-IF structure? 2

4. What are different expression lists available in Select-Case structure? 2

5. What is the purpose of ERASE statement in array? 2

6. What is the purpose of CLOSE# statement in file handling? 2

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

1. *Either*

*(a)* Write a program to display all Armstrong numbers between 1 and 999. 5

*Or*

*(b)* What do you mean by FUNCTION statement? Explain the DEF-FN statement with syntax and show how DEF-FN is different from FUNCTION-END FUNCTION statement. 1+2+2=5

2. *Either*

*(a)* Distinguish between GET# and PUT# statements with their syntaxes. Which data files these two statements are used to? 2+2+1=5

*Or*

*(b)* Write a program to determine whether a given string is a palindrome or not. 5

★★★