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ST. LAWRENCE HIGH SCHOOL



PRE ANNUAL EXAM – 2019 CLASS – 11

SUBJECT – COMPUTER SCIENCE SOLUTION
DURATION – 3 HOURS 15 MINUTES

F.M.: 70
DATE -22.1.2019

GROUP - A

1. Answer the following questions:

1X21=21

- i) The technology of Third generation computer is:
(a) Transistor (b) Vacuum tubes
(c) Microprocessor (d) Integrated Circuits
- ii) Voltmeter is an example of what type of computing device? :
(a) Hybrid (b) Digital (c) Analogue (d) None of these
- iii) $(37)_{10} = (?)_{16}$
(a) 15 (b) 25 (c) 35 (d) 45
- iv) In Sign Magnitude Representation, sign of a positive number is taken as:
(a) 0 (b) 1 (c) 10 (d) None of these
- v) The Value of $A+A = ?$ (using Boolean Algebra) :
(a) A (b) 2A (c) 0 (d) 1
- vi) $X+Y = Y+X$ falls under which law? :
(a) Commutative (b) Associative
(c) Distributive (d) None of these
- vii) SOP expression is formed by logically adding min terms for rows with output as :
(a) 0 (b) 1 (c) 01 (d) None of these
- viii) The complement of the AND gate is called a :
(a) NOT (b) NAND (c) NOR (d) XNOR

- ix) A Multiplexer circuit can select _____ input(s) from a set of inputs. :
 (a) 3 (b) 2 (c) 1 (d) None of these
- x) How many selection lines are required in 1 X 16 Demultiplexer? :
 (a) 2 (b) 8 (c) 4 (d) 16
- xi) What is the output of $F = X(X+Y)$:
 (a) Y (b) XY (c) 1 (d) X
- xii) The most significant system software is the :
 (a) compiler (b) loader (c) linker (d) operating system
- xiii) The DOS command used to create a new directory or folder in DOS is called:
 (a) MD (b) CD (c) RD (d) FD
- xiv) Which of the following is not a system defined header file in C-Language? :
 (a) stdio.h (b) function.h (c) math.h (d) conio.h
- xv) If $a=34$, $b=9$, then $a\%b$ will be equal to:
 (a) 9 (b) 3 (c) 7 (d) 4
- xvi) How do you represent the not equal to operator in C? :
 (a) not = (b) <> (c) != (d) ! =
- xvii) What is the final value of y in the C code:
 $x=2, y = ++x; y = x++;$
 (a) 4 (b) 3 (c) 2 (d) 5
- xviii) Which loop structure is used if you want to repeat a code at least once? :
 (a) while (b) do while (c) for (d) None of these
- xix) What will be the output of the following C code? :
 $\text{int } z, y = 3; z = y + 5 + ++y; \text{printf}(\text{"\%d,\%d"}, y, z);$
 (a) 11,4 (b) 4,13 (c) 4,12 (d) 3,12
- xx) Which of the following keywords is used to indicate that a function does not return anything: :
 (a) null (b) not (c) none (d) void
- xxi) Which symbol is used to declare a pointer? :

- (a) * (b) + (c) & (d) x

GROUP - B

2. Answer the following questions in brief(Alternatives are to be noted) :

1X14 = 14

i) Give one major difference between impact and non-impact printer.

A:

Basis of Distinction	Impact Printer	Non Impact Printer
Definition	The older form of printers that did not have many features.	The modern form of printers that have many more features and feasibility when it comes to printing.
Cost Effectiveness	The price of needles for an impact printer is less than the other parts.	The price of ink required for a non-impact printer becomes its biggest drawback.
Speed	Slower	Faster
Type	Dot-matrix printer, Daisy wheel printers, line printer, Drum printers, chain printers, and band printers.	Inkjet printers, photo printers, laser printers, thermal printers, mobile printers, plotters, and large-format printers.
Tool	Uses either needle or other pointy objects.	Only uses ink or laser to perform a function.

ii) $(453)_8 + (312)_8 = (?)_8$

A: $(765)_8$

OR

$(10001)_2 - (1011)_2 = (?)_2$

A: $(110)_2$

iii) Write the truth table of 2-input XOR gate.

A:

INPUTS		OUTPUTS
A	B	$Y = A \oplus B$
0	0	0
0	1	1
1	0	1
1	1	0

iv) What is meant by multiuser operating system?

A: Multi user operating system are those operating systems that can be used by multiple user simultaneously . Eg: Windows XP onwards, Ubuntu, MacOS.

OR

Give one difference between Character User Interface and Graphical User Interface.

A:

Difference between CUI and GUI

- CUI and GUI are user interface used in connection with computers
- CUI is the precursor of GUI and stands for character user interface where user has to type on keyboard to proceed. On the other hand GUI stands for Graphical User Interface which makes it possible to use a mouse instead of keyboard
- GUI is much easier to navigate than CUI
- There is only text in case of CUI whereas there are graphics and other visual clues in case of GUI
- Most modern computers use GUI and not CUI
- DOS is an example of CUI whereas Windows is an example of GUI.

v) Define variable.

A: In programming, a variable is a value that can change, depending on conditions or on information passed to the program

vi) What is the use of the Rectangle symbol in a flowchart?

A: Processing

vii) Name any two primary data types in C.

A: int, float, char etc.

viii) What is the difference between the '/' and the '%' arithmetic operators in C.

A: / : used to divide operands of integer, floating-point and decimal type. It returns the quotient of its operands

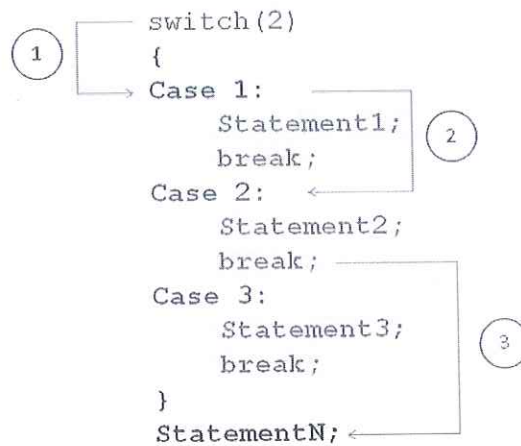
% : used to compute the remainder of the division between two operands, which can be of integer, float, double or decimal type.

ix) State one difference between the '=' and the '==' operators.

A: = is an Assignment Operator it is used to assign the value of variable or expression, while == is an Equal to Operator and it is a relation operator used for comparison (to compare value of both left and right side operands).

x) Write the syntax of 'switch case' in C-language.

A:



OR

Write an expression for an infinite loop using for loop structure in C .

```

A: short int i;
   for (i = 32765; i < 32768; i++)
   {
     printf("%d\n", i);
   }

```

This loop is an infinite loop. Here is why? According to the condition, the loop will execute until ($i < 32768$). Initially, the value of i is 32765 and after each iteration, its value is incremented by the update expression ($i++$). But the value of short int type ranges from -32768 to 32767. If you try to increment the value of i beyond 32767, it goes on the negative side and this process keeps repeating indefinitely. Hence the condition ($i < 32768$) will always be true.

x) Let $x = 5$ & $y = 2$. Write the logic to swap the values of these variables without using third variable.

```

A: x = x + y;
   y = x - y;
   x = x - y;

```

```

xii) #include<stdio.h>
      void main()
      {
        int c;
        for(c = 20 ; c >= 1 ; c - = 2)
          printf("\n%d",c);
      }

```

What will be the output of the above code?

A: 20 18 16 14 12 10 8 6 4 2

OR

What is post increment?

A: A post-increment operator is used to increment the value of variable after executing expression completely in which post increment is used. In the Post-Increment, value is first used in a expression and then incremented.

xiii) State the parts of a function header.

A: return_type function_name(parameter list)

OR

What is a function prototype?

A: In computer programming, a function prototype or function interface is a declaration of a function that specifies the function's name and type signature (arity, data types of parameters, and return type), but omits the function body.

xiv) What is an Array?

A: an array, is a data structure consisting of a collection of elements, each identified by at least one array index or key.

OR

What is the use of the '\0' character in a string in C?

A: In C programming language we don't have any data type as string. So in C programming language string is basically a character array. '\0' is the terminating character of a string.

GROUP – C

3. Answer the following questions (Alternatives are to be noted):

7X5 = 35

- i) (a) Write a short note on keyboard as an input device.
(b) Explain the terms OCR and OMR.**

3+(2+2)

OR

(a) State the full names of any 3 different type of ROM available.

A: Programmable Read-Only Memory (PROM)
Erasable Programmable Read-Only Memory (EPROM)
Electrically Erasable Programmable Read-Only Memory (EEPROM)

(b) How does a DVD differ from a CD?

A: The capacity is the biggest difference between CD and DVD
CDs are also commonly used for audio and program files, while DVDs are used for video and program files

(c) What is a Blu-ray disk?

A: Blu-ray is an optical disc format designed to display high definition video and store large amounts of data. The format's name comes from the fact that a blue laser reads from and writes to the disc rather than the red laser of DVD players. The blue laser has a 405 nanometer (nm) wavelength that can focus more tightly than the red lasers used for

writable DVD. As a consequence, a Blu-ray disc can store much more data in the same 12 centimeter space. Like the rewritable DVD formats, Blu-ray uses phase change technology to enable repeated writing to the disc.

3+2+2

ii) (a) Convert $(60D)_{16}$ to $(?)_8$

A: $(3015)_8$

(b) Subtract by using 1's complement method: $(110100)_2 - (10111)_2$

(c) Convert $(10010101)_2$ to $(?)_{16}$

A: $(95)_{16}$

3+3+1

iii) (a) Write the truth table for the following logic function. Simplify it as a sum of product form using Karnaugh map.

$$F(A, B, C) = \Sigma(1, 3, 5, 6, 7)$$

A:

A	B	C	o/p
0	0	0	0
0	0	1	1
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

(b) Prove $\overline{A + B} = \overline{A} \cdot \overline{B}$ using truth table

(2+2)+3

OR

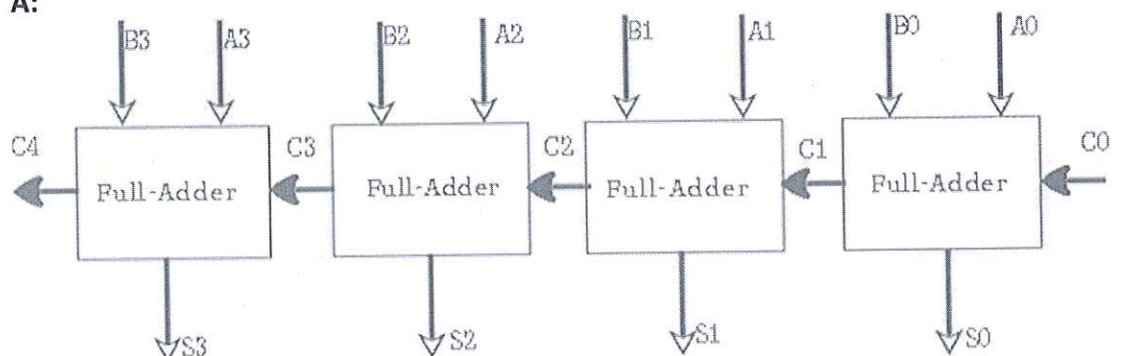
(a) Write the expression for the sum and carry outputs of a full adder circuit.

(b) How many half adders are required for a full adder?

A: 2

(c) Draw the block diagram of a 4bit adder circuit.

A:



2+1+4

iv) (a) Give 2 differences between Interpreter & Compiler.

A:

Difference between Compiler and Interpreter		
No	Compiler	Interpreter
1	Compiler Takes Entire program as input	Interpreter Takes Single instruction as input .
2	Intermediate Object Code is Generated	No Intermediate Object Code is Generated
3	Conditional Control Statements are Executes faster	Conditional Control Statements are Executes slower
4	Memory Requirement : More (Since Object Code is Generated)	Memory Requirement is Less
5	Program need not be compiled every time	Every time higher level program is converted into lower level program
6	Errors are displayed after entire program is checked	Errors are displayed for every instruction interpreted (if any)
7	Example : C Compiler	Example : BASIC

(b) What is the difference between cold and warm booting?

A:

WARM BOOT	COLD BOOT
A warm boot means restarting a computer that is already on.	A cold boot means starting a computer that is already off.
It normally happens after installing a new software or hardware or after an application crashes or stops working.	It happens when we turn on a computer that has been completely powered off.

(c) Name 3 internal and 3 external commands in DOS.

A: Internal – CLS, DATE, TIME

EXTERNAL --- SYS, FORMAT, MOVE

2+2+3

v) (a) Write a program in C to calculate the sum of digits of a user given number.

A: #include <stdio.h>

```
int main()
{
    int n, t, sum = 0, remainder;
    printf("Enter an integer\n");
    scanf("%d", &n);
    t = n;
    while (t != 0)
    {
        remainder = t % 10;
        sum = sum + remainder;
        t = t / 10;
    }
    printf("Sum of digits of %d = %d\n", n, sum);
    return 0;
}
```

(c) Write a program in C to count the number of vowels in a string

A:

```
#include <stdio.h>
int main()
{
    int c = 0, count = 0;
    char s[1000];
    printf("Input a string\n");
    gets(s);
    while (s[c] != '\0') {
        if (s[c] == 'a' || s[c] == 'A' || s[c] == 'e' || s[c] == 'E' || s[c] == 'i' || s[c] == 'I' || s[c] == 'o' || s[c] == 'O' || s[c] == 'u' || s[c] == 'U')
            count++;
        c++;
    }
    printf("Number of vowels in the string: %d", count);
    return 0;
}
```

3+4

OR

(a) Write a program in C to find the sum:

$$S = 1^2 + 2^2 + 3^2 + \dots + n^2$$

(b) Write a program in C to generate the following series:

1, 1, 2, 3, 5, 8,n.

A: #include <stdio.h>

```
int main()
{
    int i, n, t1 = 0, t2 = 1, nextTerm;

    printf("Enter the number of terms: ");
```

```
scanf("%d", &n);

printf("Fibonacci Series: ");

for (i = 1; i <= n; ++i)
{
    printf("%d, ", t1);
    nextTerm = t1 + t2;
    t1 = t2;
    t2 = nextTerm;
}
return 0;
}
```

3+4
