	Utech
Name:	
Roll No.:	A special (y Exercising and Explane)
Invigilator's Signature :	

BASIC ELECTRONICS & COMPUTER APPLICATION

Time Allotted: 3 Hours Full Marks: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

 $10 \times 1 = 10$

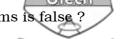
- i) The bootstrap program is stored in
 - a) RAM

b) EPROM

c) ROM

- d) CD-ROM.
- ii) The addressing capability of a processor is dependent on
 - a) width of data bus
 - b) width of address bus
 - c) width of both address bus and data bus
 - d) none of these.

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- iii) Which of the following Boolean theorems is false
 - a) A(B+C)=AB+AC
 - b) A + BC = (A + B) (A + C)
 - c) $AB + \overline{A} C = (\overline{A} + C) (A + B)$
 - d) $AB + \overline{A}C + BC = AB + \overline{A}C$
- iv) Two input NAND gate is equivalent to
 - a) $(A + B)^{I}$
- b) $AB^{\prime} + A^{\prime}B$
- c) $(AB)^{I}$
- d) (A' + B')'.
- v) Binary 1111111 0 is equivalent to hexadecimal
 - a) EF

b) FE

c) EE

- d) FF.
- vi) In C language division by zeo is a
 - a) Syntactic error
- b) Semantic error
- c) both (a) and (b)
- d) none of these.
- vii) 2's complement of 10000010 is
 - a) 01111101
- b) 10000011
- c) 01111110
- d) 11111101.
- viii) A Do while loop is useful when we want that the statement within a loop must be executed
 - a) only once
- b) at least once
- c) more than once
- d) none of these.

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ix) The output of the following code

```
For ( i - 1 ; i < = 5 ; i++)

{

If ( i%2 )

Continue ;

Printf ("%d", i) ;
}

is
```

- a) 1 2 3 4 5
- b) 135

c) 24

- d) None of these.
- x) Which of the following is an external command in DOS?
 - a) Edit

b) Copy con

c) Ren

- d) Date.
- xi) Size of (5.2) will return
 - a) 4

b) 5

c) 5·2

- d) 2.
- xii) Kernel in Unix is the
 - a) utility package part
- b) core OS part
- c) free application part
- d) none of these.

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(Short Answer Type Questions)

Answer any three of the following.



- 2. Simplify the following Boolean expressions (' implies complement): $2 \propto 2\,\frac{1}{2}$
 - a) $ABC + ABC^{\prime} + AB^{\prime}C + A^{\prime}BC$
 - b) (AB + A'B')'.
- 3. Design a half adder circuit with required truth tables and circuit diagram.
- 4. Write a *C* program to input a number and calculate the sum of individual digits present in that number and also print the number in reverse order.

Example: Input \emptyset 123

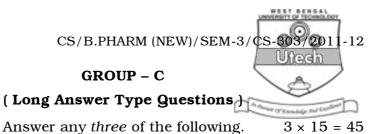
Output \emptyset Sum of individual digits : 6

Reverse of the number: 321.

- 5. Explain the difference between programs & processes. What is spooling?
- 6. Justify the statement "array is a logical concept actually it is a pointer." Illustrate your opinion with example.

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- 7. a) What is an array? How to initialize an array?
 - b) What are the limitations of an array?
 - c) What is the scope of a variable?
 - d) Write the address translation function for a two dimensional array.
 - e) Write a program which will take elements from an array to a $m \propto n$ dimensional matrix. 2 + 2 + 2 + 4 + 5
- 8. a) What is the difference between 'automatic' and 'register' storage class? Discuss when they are used.
 - b) What do you mean by universal gate? Give example.

 Implement XNOR gate using NAND gate.
 - c) What is the difference between interpreter and compiler? What are local variable and global variable? Explain with example. 5 + 5 + 5

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- 9. a) What do you mean by an operating system? What are the advantages of an UNIX operating system?
 - b) What is virtual memory? What are its advantages?

 Describe its role in computer.
 - c) Explain the difference between shell and kernel.

7 + 5 + 3

10. a) Using De-Morgan's law show that

$$(A + B)' * (A' + B')' = 0$$

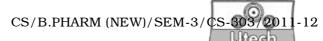
b) Using Boolean algebra, prove that

(
$$a+b$$
) ($b^{\prime}+c$) + b ($a^{\prime}+c^{\prime}$) = $ab^{\prime}+ac+b$

where a, b, c are Boolean variables.

- c) Convert decimal number 76.56 to equivalent binary number (use approximation up to 3 bits after decimal).
- d) 7627 is an octal number. Convert it into hexadecimal number.
- e) Convert the decimal number 8031 to BCD, Gray, Octal, Excess-3 and Hexadecimal code. 5×3

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- 11. a) Write a program in C to calculate the value of the series
 - $1 + 1/(1 + 2) + 1/(1 + 2 + 3) \dots + 1/(1 + 2 + 3 + \dots N)$
 - using a function. N is an integer.
 - b) Define algorithm. Explain with example. Mention the five important properties of an algorithm.
 - c) Write a menu driven program using function (call by reference) to find the following:
 - i) Factorial
 - ii) Odd / Even
 - iii) Prime. 5 + 5 + 5

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