

**SH-I/Computer Science/103/GE-1/19****B.Sc. 1st Semester (Honours) Examination, 2019-20****COMPUTER SCIENCE****Course ID : 11514****Course Code : SH-CSC-103-GE-1**

Course Title : Introduction to Programming

**Time: 1 Hour 15 Minutes****Full Marks: 25***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

- 1.** Answer *any five*: 1×5=5
- (a) Name the generation of computer with VLSI technology belongs.
  - (b) Write full form of ALU, CPU.
  - (c) What is flow chart?
  - (d) What is algorithm?
  - (e) What is structure?
  - (f) What is pointer?
  - (g) What is the use of `conio.h`?
  - (h) Write full form of RAM and EPROM.
- 2.** Answer *any two*: 5×2=10
- (a) Distinguish various generations of computers in brief.
  - (b) Draw a flow chart to check whether a given number is prime or not.
  - (c) Write short note on Input and Output devices.
  - (d) Distinguish between call by value and call by reference. Write a C program to concatenate two strings. 2+3=5
- 3.** Answer *any one*: 10×1=10
- (a) Write a program to print Fibonacci series upto 100 terms:
    - (i) Using recursion
    - (ii) Without using recursion 5+5=10
  - (b) Write a C program to find maximum and minimum of 3 integers and also write a C program to find factorial of a given number. 5+5=10
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**B.Sc. 1st Semester (Honours) Examination, 2019-20**

**Computer Science**

**Course Id : 11514**

**Course Code : SH-CSC-103-GE-1**

**Course Title : Computer Fundamentals**

**Time: 1 Hour 15 Minutes**

**Full Marks: 25**

*The figures in the margin indicate full marks.*

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

- 1. Answer any five:** 1×5=5
- (a) Convert  $(9AE \cdot AB)_{16}$  to binary.
  - (b) Name two system softwares.
  - (c) What is application software?
  - (d) What is radix?
  - (e) Distinguish between RAM and ROM.
  - (f) Define operating system.
  - (g) What is Bar-code Reader?
  - (h) Write full forms of SMPS and ALU.
- 2. Answer any two:** 5×2=10
- (a) Subtract  $(14 \cdot 51)_{10}$  from  $(20 \cdot 15)_{10}$  using 2's complement method. Add  $(11100010)_2$  with  $(1010111)_2$ . 3+2=5
  - (b) Explain different CPU registers briefly.
  - (c) Describe mobile computing in brief.
  - (d) Describe Von Neuman Architecture in brief.
- 3. Answer any one:** 10×1=10
- (a) Explain memory organization in brief.
  - (b) Describe various Input output devices in brief.
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SP-I/Computer Science/101/C-1A/19

**B.Sc. 1st Semester (Programme) Examination, 2019-20****COMPUTER SCIENCE****Course ID : 11518****Course Code : SP-CSC-101-C-1A**

Course Title : Problem Solving Using Computers

**Time: 1 Hour 15 Minutes****Full Marks: 25***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

- 1.** Answer *any five* questions: 1×5=5
- (a) Write down two functions of CPU.
  - (b) Write differences between top-down and bottom-up approach of Programming.
  - (c) Write down important characteristics of an algorithm.
  - (d) What is PVM?
  - (e) Write differences between interpreter and compiler.
  - (f) Write two advantages of flowchart.
  - (g) Why control unit of a computer system is called “Central nervous system”?
  - (h) What are the basic operations of a computer system?
- 2.** Answer *any two* questions: 5×2=10
- (a) Write down important features of Python. Explain them briefly.
  - (b) What are the important features of a computer? Write down differences between analog and digital computer.
  - (c) Write a program in Python to find HCF of 2nos.
  - (d) Draw a flowchart to display prime factors of a number.
- 3.** Answer *any one* question: 10×1=10
- (a) Explain memory hierarchy of a computer system. Differentiate between primary and secondary memory. What is locality of reference? What is hit ratio? 5+2+2+1=10
  - (b) Write a program in Python to check a no. is palindrome or not. Define tuple, frozen set 6+4=10
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**B.Sc. 1st Semester (Honours) Examination, 2019-20****COMPUTER SCIENCE****Course ID : 11511****Course Code : SH-CSC-101-C-1**

Course Title : Programming Fundamentals using C/ C++

**Time: 1 Hour 15 Minutes****Full Marks: 25***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.***1.** Answer *any five* questions from the following: 1×5=5

- (a) What is meant by procedural programming language?
- (b) What is mean by void main (void)?
- (c) What is the function of Continue statement?
- (d) Define one dimensional array.
- (e) What is command line argument?
- (f) What is meant by multiple inheritance?
- (g) What is the difference between class and structure?
- (h) What is data encapsulation?

**2.** Answer *any two* questions from the following: 5×2=10

- (a) Write differences between function call by value and function call by reference. Give example. Write a recursive C-function that will calculate factorial of a given number. 2+3=5
- (b) Discuss about different storage classes available in C. 5
- (c) What is dynamic memory allocation? Write a C-program to calculate sum of  $n$  numbers using dynamic memory allocation. 1+4=5
- (d) Write a C-program to print the following use for loop.

```

1
1 2
1 2 3
1 2 3 4

```

Write difference between while and do-while loop.

4+1=5

3. Answer *any one* from followings:

10×1=10

(a) Write use of any two string manipulating library functions. Write a C-program to copy the content of a file into another. Write difference between printf ( ) and fprintf ( ). 3+5+2=10

(b) Write differences between run time polymorphism and compile time polymorphism.

Design a C++ class to represent a bank account. Add suitable functions in it to display the balance, to deposit and withdraw a specified amount. Write a program to test the class.

What is pure virtual function?

3+5+2=10

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**B.Sc. 1st Semester (Honours) Examination, 2019-20****COMPUTER SCIENCE****Course ID : 11512****Course Code : SH-CSC-102-C-2**

Course Title : Computer System Architecture

**Time: 1 Hour 15 Minutes****Full Marks: 25***The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer *any five* questions from the following: 1×5=5
- (a) Why does NOR gate is called universal gate?
  - (b) What is Demultiplexer?
  - (c) What is combinational circuit?
  - (d) What is interrupt?
  - (e) What is half-adder?
  - (f) Write down the truth-table of XOR gate.
  - (g) What is CISC?
  - (h) Define BVS.
2. Answer *any two* questions from the following: 5×2=10
- (a) What is stack? Explain its use and different operations on it. 1+2+2=5
  - (b) Apply Booth's Algorithm with following example multiplicand = 11100 and multiplier = 10011.
  - (c) Design full-adder circuit.
  - (d) Design J-K flip-flop.
3. Answer *any one* from following: 10×1=10
- (a) Explain different organization of cache memory. Explain working of a cache memory. 4+6=10
  - (b) What is flip-flop? Design a 3-bit even parity generator. 2+8=10
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**B.Sc. 1st Semester (Honours) Practical Examination, 2019-20**

**COMPUTER SCIENCE**

**Course ID : 11522**

**Course Code : SH-CSC-102-C-2**

Course Title : Computer System Architecture

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

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

Problem = 10 marks, LNB + Viva = 5 marks

1. Answer *any one* of the followings: 10×1=10
- (a) Implement XOR gate using NAND gates.
  - (b) Implement Half-adder using Basic Gates.
  - (c) Implement full-subtractor using NAND Gates.
  - (d) Implement the function  $F = ABC + DEF$  using IC 7411.
  - (e) Implement 4-bit Binary Adder using IC 7483.
  - (f) Implement a 2-bit comparator using Basic Gates.
  - (g) Implement S-R flip-flop using NAND Gates.
  - (h) Implement full-adder using NAND Gates.
  - (i) Implement the function  $F = AC + \bar{A}D$  using Basis Gates.
  - (j) Implement  $4 \times 1$  Multiplexer using NAND Gates.
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**B.Sc. 1st Semester (Honours) Practical Examination, 2019-20**

**COMPUTER SCIENCE**

**Course ID : 11524**

**Course Code : SH-CSC-103-GE-1**

Course Title : Introduction to Programming

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

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

Experiment = 10 marks

LNB + Viva = 5 marks

- 1.** Answer *any one* of the followings: 10×1=10
- (a) Write a programme to print the sum and product of digits of an integer.
  - (b) Write a programme to compute the sum of the first  $n$  terms of the following series  
 $S = 1 - 2 + 3 - 4 + 5 \dots$
  - (c) Write a function to check whether a given string is palindrome or not.
  - (d) Write a function to find whether a given no. is prime or not. Use the same function to generate the prime numbers less than 50.
  - (e) Write a program that swaps two numbers using pointers.
  - (f) Write a program to display Fibonacci series (i) using recursion (ii) using iteration.
  - (g) Write a program to calculate factorial of a number using recursion.
  - (h) Write a program to calculate GCD of two numbers with recursion.
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**B.Sc. 1st Semester (Honours) Practical Examination, 2019-20**

**Computer Science**

**Course Id : 11524**

**Course Code : SH-CSC-103-GE-1**

**Course Title : Computer Fundamentals**

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

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

LNB + Viva = 5 marks

**1. Answer any one:** 10×1=10

(a) Given the following work sheet.

	A	B	C	D
1.	Roll No.	Name	Marks	Grade
2.	101	Sachin	99	
3.	102	Sana	65	
4.	103	Rahul	41	
5.	104	Sourav	89	
6.	105	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

if Marks	Then Grade
$\geq 80$	A+
$\geq 60 < 80$	A
$\geq 50 < 60$	B
$< 50$	F

(b) Use an array formula to calculate Simple Interest for given principal amounts given the rate interest and time

Rate of interest = 8%

Time = 5 years

Principal	Simple Interest
1000	?
18,000	?

(c) Create payment table for a fixed Principal amount, variable Rate of interest and time in the format below:

No. of Instalment	5%	6%	7%	8%
3	xx	xx	xx	xx
4	xx	xx	xx	xx
5	xx	xx	xx	xx
6	xx	xx	xx	xx

(d) A company XYZ Ltd, pays a monthly salary to its employees which consists of basis salary, allowances and deduction. The details of allowances and deductions are as follow:

(i) HRA = 30%, if Basic  $\leq$  1000  
= 25%, if Basic  $>$  1000 and Basic  $\leq$  3000  
= 20%, if Basic  $>$  3000

(ii) DA = 30% of Basic

(iii) > conveyance Allowance = Rs. 50, if Basic  $\leq$  1000  
= Rs. 75, if Basic  $\geq$  1000 and Basic  $\leq$  2000  
= 100, if Basic  $>$  2000

(iv) Deduction:

PF = 6% of Basic

Calculate the following:

Gross salary = Basic + HRA + DA + Conveyance

Net salary = Gross salary – Deduction

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**B.Sc. 1st Semester (Programme) Practical Examination, 2019-20**

**COMPUTER SCIENCE**

**Course ID : 11528**

**Course Code : SP-CSC-101-C-1A**

Course Title : Problem Solving Using Computers

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

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

LNB + Viva = 5 marks, Experiment = 10

1. Perform *any one* experiment: 10×1=10
- (a) Write a program in Python to find factorial of a number.
  - (b) Write a program in python to find largest among 10 nos.
  - (c) Write a program in python to find prime factors of a number.
  - (d) Write a program in python to display Fibonacci of  $n$  terms.
  - (e) Write a program in python to find HCF of three nos.
  - (f) Write a program in python to display Armstrong numbers from 1 to 300.
  - (g) Write a menu-driven program, using user-defined function to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
  - (h) Write a program in python to find product of two matrices.
  - (i) Write a program in python to find reverse of any number.
  - (j) Write a program to convert decimal to binary using user-defined function in python.
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**B.Sc. 1st Semester (Honours) Practical Examination, 2019-20**

**COMPUTER SCIENCE**

**Course ID : 11521**

**Course Code : SH-CSC-101-C-1**

Course Title : Programming Fundamentals using C/ C++

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the margin indicate full marks.*

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

Experiment = 10, LNB + Viva = 5

1. Perform *any one* experiment.
    - (a) Write a C-program to find out the factorial of a given number.
    - (b) Write a program in C to Check whether a given number is prime or not.
    - (c) Write a C-program to print the first n-Fibonacci numbers.
    - (d) Write a C-program to print the reverse of a number, (For example reverse of 345 is 543).
    - (e) Write program in C which will read a text and count all occurrences of a particular word.
    - (f) Write a recursive in C-program to find out *n*-th Fibonacci number.
    - (g) Write a C-program using pointers to read in an array of integers and print its elements in reverse order.
    - (h) Write a C program that appends a file at the end of another file.
    - (i) Write a program in C++ to implement multiple inheritance.
    - (j) Write a program in C++ to overload the '+' operator for matrix addition.
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