

Roll No. \_\_\_\_\_

Paper Code -TCS-101  
**B.Tech Mid Semester Examination 2019**  
**1 Semester**

Fundamentals of Computer and Introduction to Programming

Time: 1:30 Hours

MM: 50

Note:

- (i) All questions are compulsory.
- (ii) Answer any two sub-question among a, b and c in each main question.
- (iii) Total marks for each main question are ten.

**Q1. a)** Explain the following topologies with the help of the appropriate diagram. Also, write their advantages and disadvantages and when to use which topology.

- i) Bus
- ii) Star
- iii) Mesh

b) Draw a flowchart to accept two integer numbers and perform division between them. If the divisor is zero than display a message that "Division not possible".

c) Write a program to input a positive integer number and check whether that number is multiple of 5 or not. If it is then consider this number as a side of the square and calculate the area of square otherwise consider it as a radius of a circle and calculate the area of a circle.

<i>Sample Input</i>	<i>Sample Output</i>
10	Area of the square: 100.00
3	Area of circle: 28.26

**Q2. a)** Explain with appropriate diagram the life cycle of C involving all the steps.

b) Find the output of following codes with proper reason.

<pre>1) #include&lt;stdio.h&gt; void main() { int a; float b; b=15/2; printf("%f",b); b=(float)15/2+(15/2); printf("%f",b); }</pre>	<pre>2) #include&lt;stdio.h&gt; void main° { int a,b,c,d; a=b=c=d=4; a b+1 ; c +=d *= 3; printf("%d%d",a,c); }</pre>
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c) Write a program to input two different times in a given format (hour, minute, second) and add them. Display the output in the following format.

Note: In resultant time seconds and minutes should not exceed 60.

<i>Sample Input</i>	<i>Sample Output</i>
Hr Min Sec Time1: 11 59 59 Time2: 03 02 05	Hr Min Sec 15 02 04

Q3. What is the Operating System? Write and explain at least three essential services provided by an OS.

b) Calculate following expressions according to precedence and associativity.

i) a=8, b=5, c=8, d=3, e=65, f=10, g=2, h=5, k=2

$a - b + c / d = e / f - g + h \% k$

ii) a = -8, b = -3, c = 2, d = 3, e = 2, f = 1

$a - b \parallel (a - b * c) + d \&\& e - f \% 3$

c) Write a program to take a character (*ch*) as input and check whether the given character is a small case alphabet or capital case alphabet or a digit or a special character.

<i>Sample Input</i>	<i>Sample Output</i>
9	digit
x	Alphabet small case
R	Alphabet capital case
#	Special character

Q4. a) What is the difference between unary, binary and ternary operators? Give an appropriate example of each.

b) Draw a flowchart to calculate the following series.

$n*(n-1)*(n-2)* \dots \dots \dots 1$

c) Write a program to input a positive integer number and find the sum of digit of that number.

<i>Sample Input</i>	<i>Sample Output</i>
125	Sum of digits: 8

Q5.a) Explain memory hierarchy. Your answer should include factors like cost, access time, storage capacity, etc. Also, calculate the number of Bytes in 1 Terabyte.

b) Draw a flowchart to find smallest among N integer numbers.

c) Write a program to find sum of following series:

$1 - 2*2 + 3*3 - 4*4 + 5*5 \dots \dots \text{upto } N.$