COMSATS University Islamabad, Lahore Campus

☑ Sessional-1 ☐ Sessional-II ☐ Terminal Examination – FALL 2020

Course Title:	Design and Analysis of Algorithms			Course Code:	CSC301	Credit Hours:	3
Course Instructor/s:	Dr. Hasan Jamal			Programme Name:	BS Computer Science		
Semester:		Batch:		Section:		Date:	22/10/2020
Time Allowed:	**40 minutes**			**Maximum Marks:**			**20**
Student's Name:				Reg. No.			

Important Instructions / Guidelines:

- Type your answers in this sheet and submit the assignment on Google Classroom
- No late submission allowed
- Any solution found to be copied would strictly result in zero marks

Question 1: **[Marks: 8]**

Prove or disprove: $2^{n-2} \in \Theta(2^n)$

Question 2: **[Marks: 12]**

For the following code snippet, provide a line-by-line analysis and construct function T(n) that give the runtime of this code snippet as a function of "n". Also determine the Big-Oh of this code snippet.

fail = 0	
pass = 0	
student = 1	
while (student ≤ n)	
m = take input exam marks	
if (m > 50)	
pass ++	
student ++	
Pass(m)	
else	
fail ++	
student ++	
Fail(m)	
endif	
endwhile	
print(pass)	
print(fail)	
if ((pass*100/n) > 70)	
print "good effort"	
endif	
Pass (a) {	
for (i = 0; i < M; ++i)	
for (j = M; j < i; --j)	
a = a*(i + j);	
return a;	
}	

Fail (a) {	
for (int i = 1; i ≤ n+n+n; ++i)	
a = a * i;	
return a;	
}	