National University of Sciences and Technology (NUST)
School of Electrical Engineering and Computer Science

Lab Exam

[CS361: Computer Graphics]

[4th Jan, 2016]

[BESE 3 / BSCS 2]

Registration # _____ **Name:** _____

Signature: _____ **Section:** _____

Instructions

This is open book and open notes.
You can use scientific calculators but programmable calculators are NOT allowed.
You CANNOT use network. All network communication must be disabled.
You CANNOT share notes, books or talk during the exam.
The exam has two questions in all.
The exam consists of one page with both sides' printed.
Total time allowed is 150 minutes

	Marks / CLOs Mapping	
CLOs	CLO 2	CLO 3
Total Marks	**Q # 1**	**Q # 2**
20 Marks	10 Marks	10 Marks

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Dr. Muhammad Muddassir Malik Knowledge Group Head

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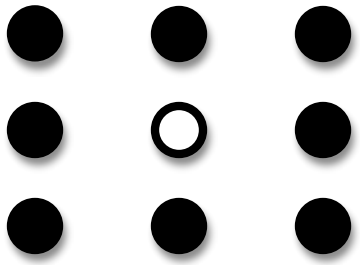
Invigilator's Signature

Question 1:

Write a program that takes eight (8) values as input from the user and calculates a 2D normal for the pixel in the centre. Refer to the figure below: User inputs values for locations colored black and your program calculates the normal at the location colored white. **[10]**



Question 2:
Load a 3D model into a Three.js program and draw a plane under it. Implement spot light in the program with shadows turned on. Use dat.GUI to implement options to rotate (about all the axis), scale and clone the 3D object and also to move around the spot light. **[9]**

Bonus: Implement option to switch between Gauraud and Phong Shading. **[1]**