Question Paper (Duration: 1hr 30 Minutes)

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Honor Code

0 points possible (ungraded)

On this exam, I will not cheat, use unfair means, join intentionally or unintentionally any online or offline group in which exam answers are posted or discussed, or engage in any behavior that would commonly be deemed academically unethical. I acknowledge that I may be suspended or expelled from Brac University if I am found to have engaged in any academically unethical behavior. I understand that a certain percentage of students will be randomly selected for a viva after the exam and asked about their exam answers and related information and that if called for a viva, that I must appear for the viva within a designated time frame. I understand and accept that the viva may be scheduled at any point in time after I submit my answers online. I understand that if I do not appear for the viva without a valid reason, it will be considered as evidence of cheating. An inability to explain my exam answers during the viva may also be construed as evidence of cheating. I consent to video/audio recording of these viva sessions. I further recognize that non-compliance with the above may lead to further disciplinary actions which I accept without complaint.

Do you agree with the statement?

- (●) I agree with the statement
- ( ) I do not agree with the statement

✔

Submit

Show Answer

ANSWER ALL THE QUESTIONS.

Total Marks: 25

You have to submit a scanned pdf copy of all the handwritten answer scripts together.

Please answer to the point. We are highly discouraging too much text.

Section-1 (2 X 4 = 8 marks)

Explain Briefly how autonomous cars can detect objects around themselves.

Suppose you want to build a robot that can perform rescue operations (detect and rescue living beings) in a **snowy** region.

What kind of perception sensors should you implement and why? Justify your answers briefly.

Section-2 (2 X 4 = 8 marks)

How PID controllers can be tunned using Ziegler-Nichols Rules?

What are the characteristics of a Feedback System? Draw the Classic Feedback System Diagram?

Section-3 (1 X 4 = 4 marks)

What is Localization? Briefly explain any two localization techniques.

Section-4 (1 X 5 = 5 marks)

Suppose you are designing an intelligent cooling system for a smart home and you have to choose a personal area network for your system.

What kind of network should you use and why? Justify your answer.