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Daffodil International University

Faculty of Science & Information Technology

Final Examination, Spring 2023

Course Code: CSE231

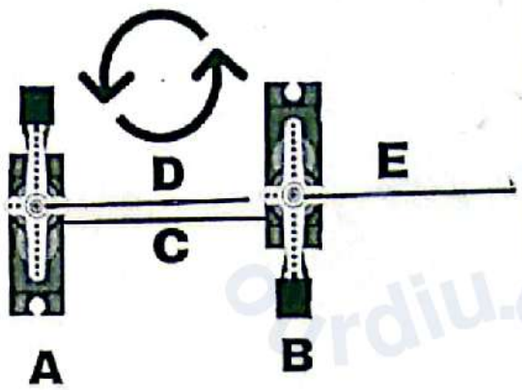
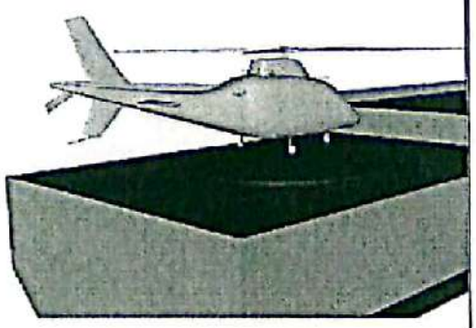
Course Title: Microprocessor, Embedded Systems and IoT

Level: 3 | **Term: 1** | **Batch:59**

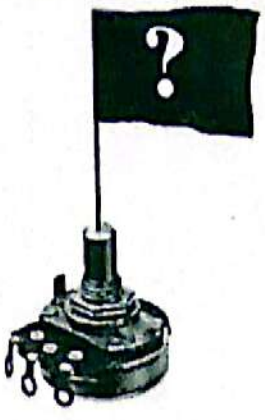
Time: 2 Hrs | **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	In figure 1, there are two servos (A and B). C, D and E are three rods of equal length where C is attached and fixed to the body of A and B. D and E are attached to the rotating part (crossed horn) of the servo. Both servos are at 0 degree position right now and they can rotate up to 180 degrees anticlockwise. Now, **develop** a microcontroller-based solution (with circuit diagram, code and explanation) to control the servos in such a way that the tip of D and E touches and C, D and E forms a triangular shape.  *Figure 1: Servo Motors*	[10]	CO4 L3
2	Suppose, you want to design a system to detect whether a helicopter landing site is free or allocated by a helicopter. Keep in mind that there is a bird in that area that may misguide your system by landing on the site. Now, **recommend** a microcontroller-based solution (with circuit diagram, code and explanation) that will be able to detect the helicopter landing properly ignoring the bird.  *Figure 2: Helicopter Landing*	[10]	CO4 L5

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3	**Develop** a microcontroller-based solution (with circuit diagram, code and explanation) in which you will input any decimal number (between 0 and 9) through keypad and its binary will be shown using arrangement of four LEDs. For example, if you enter 9, the binary will be 1001 and first and last LED will light up. If you enter 5 the binary will be 0101 so second and last LED will light up.	[10]	CO4 L3
4	Suppose there is a potentiometer, the knob of which is very loose. It is so loose that if we glue a flag on its knob and place it in rooftop then as the wind flows the knob will rotate accordingly. Now, **recommend** a system (with circuit diagram, code and explanation) using this potentiometer, that will be able to output the direction of wind flow (east, west, south or north) in an LCD screen.  *Figure 3: Potentiometer with a flag*	[10]	CO4 L5

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