



Daffodil International University
Faculty of Science & Information Technology
Final Examination, Spring 2023
Course Code: CSE231

Course Title: Microprocessor, Embedded Systems and IoT

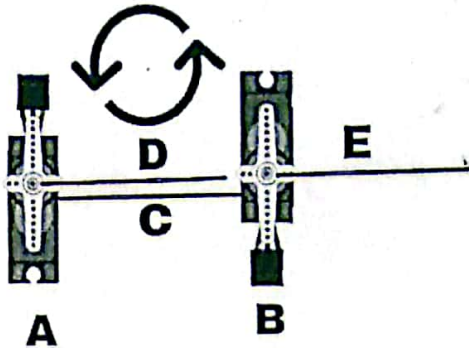
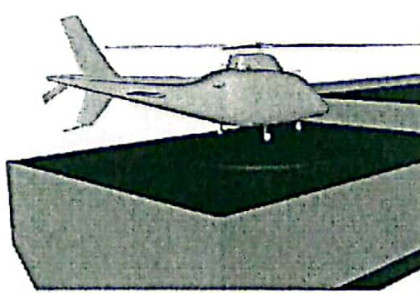
Level: 3
Time: 2 Hrs

Term: 1

Batch:59
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.]

<p>1</p>	<p>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.</p>  <p style="text-align: right;"><i>Figure 1: Servo Motors</i></p> <p>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.</p>	<p>[10]</p> <p>CO4 L3</p>
<p>2</p>	<p>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.</p>  <p style="text-align: right;"><i>Figure 2: Helicopter Landing</i></p> <p>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.</p>	<p>[10]</p> <p>CO4 L5</p>

3	<p>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.</p> <p>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.</p>	[10]	CO4 L3
4	<p>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.</p> <p>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.</p> <div data-bbox="885 488 1136 873" data-label="Image"> </div> <p style="text-align: center;"><i>Figure 3: Potentiometer with a flag</i></p>	[10]	CO4 L5