<table>
<thead>
<tr>
<th>Tick the Relevant</th>
<th>Computer Science B.Sc. Program ABET Student Outcomes</th>
<th>Question No. Relevant Is Hyperlinked</th>
<th>Covering %</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>a) Apply knowledge of computing and mathematics appropriate to the discipline;</td>
<td>1,2</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>b) Analyze a problem, and identify and define the computing requirements appropriate to its solution</td>
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<tr>
<td>✓</td>
<td>c) Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;</td>
<td>3,4</td>
<td>52</td>
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<tr>
<td></td>
<td>d) Function effectively on teams to accomplish a common goal;</td>
<td></td>
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<td></td>
<td>e) Understanding of professional, ethical, legal, security, and social issues and responsibilities;</td>
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<td></td>
<td>f) Communicate effectively with a range of audiences;</td>
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<td></td>
<td>g) Analyze the local and global impact of computing on individuals, organizations and society;</td>
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<tr>
<td></td>
<td>h) Recognition of the need for, and an ability to engage in, continuing professional development;</td>
<td></td>
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</tr>
<tr>
<td>✓</td>
<td>i) Use current techniques, skills, and tools necessary for computing practices.</td>
<td></td>
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<tr>
<td></td>
<td>j) Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;</td>
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<td></td>
<td>k) Apply design and development principles in the construction of software systems of varying complexity;</td>
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</table>

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Question 1 (8 Marks):

(i) Circle the operator which is not a relational operator?
   a. ==
   b. <
   c. !=
   d. &&
   e. >=

(ii) If `value` is a Boolean variable, which of the following logical expressions always has the value FALSE?
   a. `value && value`
   b. `value || value`
   c. `value && ! value`
   d. `value || ! value`
   e. b and d above

(iii) After execution of the following code, what will be the value of `angle` if the input value is 15?
   ```java
   angle = in.nextInt();
   if (angle > 5)
       angle = angle + 5;
   else if (angle > 10)
       angle = angle + 10;
   else angle = 5;
   ```
   a. 5
   b. 15
   c. 25
   d. 20

(iv) Which statement is correctly written? (suppose that beta is an integer variable and result is a Boolean variable)
   a. `result = 0 < beta < 100 ;`
   b. `result = 0 < beta && beta < 100 ;`
   c. `result = (0 < beta) && (beta < 100) ;`
   d. b and c above
   e. a, b, and c above
Question 2 (6 Marks):
Convert the following switch statement into if–else statement

String dayString1, dayString2, dayString3;
int day = in.nextInt();
switch (day) {
    case 1: dayString1 = "Saturday"; 
    case 2: dayString2 = "Sunday"; 
         break;
    case 3: dayString3 = "Monday"; 
         break;
    case 4: dayString1 = "Tuesday";
    case 5: dayString2 = "Wednesday";
         break;
    default: dayString3 = "Invalid day";
         break;
}

Answer:
Question 3 (8 Marks):

We would like to write a program that reads a number of seconds, a number of minutes and a number of hours. It converts them into seconds and print the result.

For that:

1. determine the input and the output
2. list the needed variables and their types
3. write down a suitable conversion formula(s) that solves the problem
4. Suggest and write a complete java program solution

Answer:
Question 4 (8 Marks):

Consider the class Pattern with the following attributes:
- Side1 : represents a length side of the pattern
- Side2 : represents another length side of the pattern
- type : represents the type of the pattern (rectangle, triangle or square)
- area : represents the area of the pattern

a- Implement the class Pattern.
b- Write a java program that performs the following:
i- creates an object of the class Pattern.
ii- reads the needed attributes and calculates the area with respect to the type of the pattern according to the following table.

<table>
<thead>
<tr>
<th>Pattern</th>
<th>type</th>
<th>side1</th>
<th>side2</th>
<th>area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle</td>
<td>1</td>
<td>height</td>
<td>Width</td>
<td>side1*side2</td>
</tr>
<tr>
<td>Triangle</td>
<td>2</td>
<td>height</td>
<td>Base</td>
<td>side1*side2/2</td>
</tr>
<tr>
<td>Square</td>
<td>3</td>
<td>side</td>
<td>--</td>
<td>side1*side1</td>
</tr>
</tbody>
</table>

Example if type is 1 the pattern is a rectangle, side1 will represent the height, side2 will represent the width and the area will be equal to side1*side2.

iii- Displays the name of the pattern (rectangle, triangle or square) and its area

Answer:
<table>
<thead>
<tr>
<th>Question No.</th>
<th>Relevant Student Outcome</th>
<th>SO is Covered by %</th>
<th>Full Mark</th>
<th>Student Mark</th>
<th>Assessor’s Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a</td>
<td>26</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>a</td>
<td>22</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>c</td>
<td>26</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>c</td>
<td>26</td>
<td>8</td>
<td></td>
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<tr>
<td>Totals</td>
<td></td>
<td>100%</td>
<td>30</td>
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</tbody>
</table>

I certify that the work contained within this assignment is all my own work and referenced where required.

Student Signature: __________________________ Date: ____________

Feedback Received: __________________________

Student Signature: __________________________ Date: ____________