Assignment 6

This assignment is due on [Due Date]. It consists of 5 questions. Questions 1 to 3 are multiple choice, and 4 and 5 are problems. Each question is worth a certain number of marks, as indicated next to the question. You are recommended to show your working where possible.

Question 1

Which of the following is true about the statement “A capacitor is a device that stores electrical energy”? (3 marks)

A. True
B. False
C. Both A and B are possible answers
D. Cannot be determined

Question 2

Which of the following is true about the statement “An inductor is a device that stores magnetic energy”? (3 marks)

A. True
B. False
C. Both A and B are possible answers
D. Cannot be determined

Question 3

Which of the following is true about the statement “A transformer is a device that changes voltage”? (3 marks)

A. True
B. False
C. Both A and B are possible answers
D. Cannot be determined

Question 4

A capacitor has a capacitance of 100 μF and a voltage of 50 V. What is the stored energy in the capacitor? (3 marks)

A. 0.5 J
B. 2.5 J
C. 5.0 J
D. 10.0 J

Question 5

An inductor has an inductance of 5 H and a current of 10 A. What is the stored energy in the inductor? (3 marks)

A. 125 J
B. 250 J
C. 500 J
D. 1000 J

Question 6

A transformer has a primary winding with 100 turns and a secondary winding with 200 turns. If the voltage across the primary winding is 20 V, what is the voltage across the secondary winding? (3 marks)

A. 10 V
B. 20 V
C. 40 V
D. 80 V

Question 7

A capacitor has a capacitance of 500 μF and a voltage of 100 V. If the voltage across the capacitor is doubled, what is the new stored energy? (3 marks)

A. 50 J
B. 100 J
C. 200 J
D. 400 J

Question 8

An inductor has an inductance of 2 H and a current of 5 A. If the current through the inductor is doubled, what is the new stored energy? (3 marks)

A. 5 J
B. 10 J
C. 20 J
D. 40 J

Question 9

A transformer has a primary winding with 200 turns and a secondary winding with 100 turns. If the voltage across the primary winding is 50 V, what is the voltage across the secondary winding? (3 marks)

A. 25 V
B. 50 V
C. 75 V
D. 100 V

Question 10

A capacitor has a capacitance of 100 μF and a voltage of 100 V. If the voltage across the capacitor is halved, what is the new stored energy? (3 marks)

A. 50 J
B. 100 J
C. 200 J
D. 400 J