Please fill in your Student Number and Name.	
Student Number :	Student Number:

Name:

University of Cape Town ~ Department of Computer Science Computer Science 1016S ~ 2008

Test 3

Question	Max	Mark	Internal	External
1	7			
2	13			
3	10			
TOTAL	30			

Marks: 30

Time : 40 minutes

Instructions:

a) Answer all questions.

b) Write your answers in the space provided.

c) Show all calculations where applicable.

Question 1: Data Structures [7]

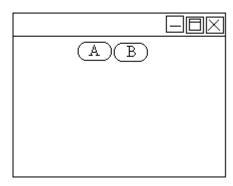
/rite down the	e result of prin	ting out the it	ems in the ti	ree above usi	ng inorder p	processing. [3]

Question 2: GUIs [13]

The following program produces the GUI shown. Only some of the elements of the GUI are indicated. In particular, the buttons marked A and B here will have different labels in the actual GUI.

```
Buttons Program:
import javax.swing.JFrame;
import javax.swing.JButton;
import java.awt.FlowLayout;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
public class Buttons extends JFrame implements ActionListener
   JButton one;
   JButton two;
   public Buttons()
      super("Buttons");
      setSize(400, 200);
      setLayout(new FlowLayout());
      one = new JButton("one");
      two = new JButton("one");
      one.addActionListener(this);
      two.addActionListener(this);
      add (one);
      add(two);
   }
   public void actionPerformed(ActionEvent e)
      String choice = e.getActionCommand();
      if (choice.equals("one"))
         System.out.println(one.getText());
         two.setActionCommand("two");
      }
      else
         System.out.println(choice);
   }
   public static void main(String[] args)
      Buttons gui = new Buttons();
      gui.setVisible(true);
}
```

Buttons GUI:



a) Redraw the GUI as it will appear when the program is run. That is, fill in any information that is missing or mislabelled in the diagram above. [3]

- b) Write down what the program does when the following actions are performed.
 - i) Click button A first, followed by button B, followed by button A. [1]
 - ii) Click button B first, followed by button A, followed by button B. [1]

iii)Click the X button at the top right hand corner.	
Rewrite the program so that it uses a menu instead of buttons.	

Question 3: Ethics [10]

he foll	owing five questions choose the letter of the <i>one hest</i> ontion:	
he foll	owing five questions choose the letter of the <u>one best</u> option:	
	owing five questions choose the letter of the <u>one best</u> option:	
. relativi		
relativi A. ti	st claims that	
A relativi A. ti B. n	st claims that here are no universal moral principles.	
A. ti B. n C. n	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical.	
A. ti B. n C. n D. ti	st claims that here are no universal moral principles. horality has an existence outside the human mind.	
A. ti B. n C. n D. ti E. C	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical. here is no such thing as free will. God does not exist.	
A. ti B. n C. n D. ti E. C	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical. here is no such thing as free will. God does not exist. g to Kant, the moral value of an action depends upon	
A. the B. m. C. m. D. the E. C. c. c. c. c. c. c. d. d. in	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical. here is no such thing as free will. God does not exist. g to Kant, the moral value of an action depends upon as consequences.	
A. the B. m. C. m. D. the E. C. c. c. c. c. c. c. d. d. t. d. d. d. t. d. d. d. t. d.	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical. here is no such thing as free will. God does not exist. g to Kant, the moral value of an action depends upon as consequences. he underlying moral rule.	
A. to B. n C. n D. to E. C ccording A. it B. to	st claims that here are no universal moral principles. horality has an existence outside the human mind. horality and law are identical. here is no such thing as free will. God does not exist. g to Kant, the moral value of an action depends upon as consequences.	

d) The Principle of Utility in Utilitarianism can also be called	[1]
A. the Categorical Imperative.	
B. the Difference Principle.	
C. the Greatest Happiness Principle.	
D. the Social Contract.	
E. the Ten Commandments.	
e) Two philosophers closely associated with utilitarianism are	[1]
A. Jeremy Bentham and John Stuart Mill.	
B. Immanuel Kant and Jeremy Bentham.	
C. Immanuel Kant and John Stuart Mill.	
D. John Stuart Mill and John Rawls.	
E. Jean-Jacques Rousseau and John Rawls.	
f) Utilitarianism is an example of	[1]
A. the divine command theory.	
B. a cultural relativism theory.	
C. the social contract theory.	
D. a teleological theory.	
E. a relativistic theory.	