Part 1: Multiple Choice (102 points - 3 points per question)

(C) 1. The ________ of a language describes the arrangement of words and punctuations that are legal in the language.
   (A) semantics (B) syndicate (C) syntax (D) None of the above

(A) 2. a, b, and c are 3 integers and a = -3, b = 5, c = -2 What is the value of a double variable d after running
   d = c + a / c % a * b - a;?
   (A) 6.0 (B) 7.0 (C) 8.0 (D) None of the above

(A) 3. Standard code libraries in Java are called: (A) Packages (B) Methods (C) Classes (D) Statements

(C) 4. Which of the following statement about Java is false?
   (A) Java supports method overloading. (B) The printf method can be used to output formatted values.
   (C) If a class has no constructor, no default constructor can be used. (D) Java uses Unicode character set.

(B) 5. What is the value of i after running i = 100; while (i-- > 10);
   (A) 8 (B) 9 (C) 10 (D) None of the above

(D) 6. Which type can be used in the expression for a switch statement?
   (A) boolean (B) float (C) long (D) None of the above

(B) 7. Assume a = 2 and b = 8, which of the following is true?
   (A) a > 3 || b > 12 (B) a * b > 20 || b/a > a % b (C) "abc".equals("ABC") (D) None of the above

(A) 8. A method that is used to return the value of a variable in an object is a ________.
   (A) accessor (B) mutator (C) constructor (D) all of the above

(D) 9. How many times is the following code invoked by the call recursive(32)?
   void recursive(int i) {
       if (i > 1) {
           System.out.print(i + " ");
           recursive(i/2);
       }
   }
   (A) 2 (B) 4 (C) 8 (D) none of the above

(D) 10. Given int a[5] = {1, 6, -2, 8}, i = 1. What is the value of a[a[2 * i]] + a[i]?
   (A) 4 (B) 6 (C) 8 (D) none of the above

(D) 11. Consider an long, i and an long array, a. Which is the correct way to use the for each in Java?
   (A) for (long i : a) a = 0; (B) for each (long i : a[]) i = 0; (C) for (long i : a[]) i = 0; (D) None of the above

(A) 12. If a and b are two two-dimensional integer arrays, which operation is illegal?
   (A) a = b (B) a == b (C) a.equals(b) (D) None of the above

(B) 13. To declare a constant in Java, which modifier should be used?
   (A) abstract (B) final (C) constant (D) None of the above

(C) 14. For 3.6, which method will return 3.0?
   (A) Math.ceil(3.6) (B) Math.round(3.6) (C) Math.floor(3.6) (D) None of the above

(A) 15. Which is the parent constructor of a class? (A) super() (B) parent() (C) upper() (D) None of the above

(A) 16. Which operating system is Android based on? (A) Linux (B) MacOS (C) Windows (D) None of the above

(C) 17. Which is an emulator configuration that lets you model an actual device?
   (A) ADT (B) APK (C) AVD (D) None of the above

(B) 18. Which is the file format used to distribute and install Android application?
   (A) ADT (B) APK (C) AVD (D) None of the above

(C) 19. Which is the layout file in Android project? (A) activity.xml (B) interface.xml (C) main.xml (D) None of the above

(A) 20. Which defines the contents and behavior of your application?
   (A) AndroidManifest.xml (B) main.xml (C) string.xml (D) layout.xml

(D) 21. Which is not a member of Open Handset Alliance? (A) Google (B) Intel (C) HTC (D) Nokia

(C) 22. Which is the basic building blocks of a user interface in Android? (A) Activity (B) Layout (C) View (D) none of above

(C) 23. Which is a DBMS on Android? (A) MS SQL Server (B) MySQL (C) SQLite (D) none of above

(C) 24. Which layout positions its children into rows and columns?
   (A) FrameLayout (B) LinearLayout (C) TableLayout (D) RelativeLayout

(B) 25. Which is the code name of Android 4.x?
   (A) Donut (B) Ice Cream Sandwich (C) Gingerbread (D) Honeycomb

(B) 26. Which can be used to share data among applications? (A) activity (B) content provider (C) intent (D) service

(D) 27. Which dimension units in Android means scale-independent pixels?
   (A) px (B) in (C) dp (D) sp

(D) 28. Which send an WARN log message? (A) log.d() (B) log.i() (C) log.e() (D) none of the above

(D) 29. Which input type is used to indicate it is read only?
   (A) readonly (B) text (C) editable (D) none of above
30. Which class can be used for multiple choices?
   (A) RadioButton (B) SwitchButton (C) CheckButton (D) CheckBox

31. Which means that the view wants to be just big enough to enclose its content?
   (A) wrap_content (B) fill_content (C) fill_parent (D) wrap_view

32. Which class is a view containing a quick little message for the user? (A) Dialog (B) Intent (C) Toast (D) View

33. Which is correct way to create a variable ID txtA? (A) @txtA (B) @+id/txtA (C) @id/txtA (D) id.txtA

34. Which is the interface definition for a callback to be invoked when a view is clicked?
   (A) View.Callback (B) View.invokeClick (C) View.Listener (D) View.OnClickListener

Part 2: Questions and Answers (52 points)

1. (a) (3 points) What is the main difference between a Java applet and a Java application?
   (b) (3 points) What is the main difference between a class and an object?
   (c) (4 points) What is the main difference between a static and instance variable?
   (d) (6 points) Explain static and instance methods.

   Ans:
   (a) The difference is that applications is run on your computer whereas an applet is run from a Web browser.
   (b) A class is a template that defines the variables and the methods common to all objects of a certain type where an
       object is an instance of a class. There is one class and many objects.
   (c) There is only one copy of a static variable per class, unlike instance variables where each object has its own copy.
   (d) i. A instance method is a method which must be invoked via an instance of a class.
       ii. A static method is a method which can be invoked via the name of the class in which they are defined.

2. (a) (5 points) Create a class for a point has the following specifications:
   i. (2 points) Constructor Summary: public Point(double x, double y): Construct a point at (x, y).
   ii. (3 points) Method Summary:
       A. public double getX(), getY(): Return the x-axis and y-axis value of the point respectively.
       B. public setPoint(double x, double y): Set the point at (x, y).

   (b) (11 points) Create a class for a circle using the above Point definitions.
   i. (2 points) Constructor Summary: public Circle(Point p, double r): Construct a circle at the center point p with
      the radius r.
   ii. Method Summary:
       A. (2 points) public Point getCenter(): Return the center point of the circle.
       B. (2 points) public double getRadius(): Return the the radius of the circle.
       C. (2 points) public setCircle(Point p, double r): Set a circle at the center point p with the radius r.
       D. (3 points) public boolean isInside(Point p): Return true if the point p is inside the circle and false if the
          point p is outside of the circle.

   class Point {
       private double x, y;
       Point(double ix, double iy) { setPoint(ix, iy); }
       public double getX() { return x; }
       public double getY() { return y; }
       public void setPoint(double ix, double iy) { x = ix; y = iy; }
   }

   class Circle {
       private Point point;
       private double radius;

       Circle (Point p, double r) {
           point = new Point(p.getX(), p.getY());
           radius = r;
       }

       public Point getCenter() {
           return (new Point(point.getX(), point.getY()));
       }
   }
3. (10 points) Illustrate Android architecture. List the four layers and at least two components in each layer.

3. (10 points) Illustrate state transitions of an activity.