

Answers

Part I

1 5 TTTTF 6 10 FFFFT

Part II

1 5 BCADD 6 10 BBCCD 11 15 BCCBD

Part III

1. Encapsulation 2.extends 3.instance 4.Instanceof 5.new
6. Static 7.iteration 8.super 9.Protected 10.import
11.return 12.syntax 13.If-else 14.Immutability 15.stack

Part IV

1. +, -, *, /, %, &&, ||, &, |, ==, etc;
2. Overridden methods use dynamic binding. We can write a public getter method for all the classes, then use superclass variables to call the getter to access subclass objects' private instance variables polymorphically.
3. QAQ, string, \$_\$abc
4. x,y,p,q,g
5.
 - (1) Compile error.
 - (2) The generic parameter may accept classes that don't implement compareTo method.
 - (3) Set upper bound for generic parameter T. i.e. <T extends Comparable<T> >

Part V

1.
 - (1) true
 - (2) loca<n*m or loca<a.length-1
 - (3) diry[dir]
 - (4) res[locx][locy]=a[loca]
 - (5) dir=(dir+1)%4
2.
 - (1) 1
 - (2) j<i

(3) $a[j] < a[i]$

(4) $f[i], f[j] + 1$ or $f[j] + 1, f[i]$

(5) $ans, f[i]$ or $f[i], ans$

3.

Codes for reference

```
1 public class Human
2 {
3     int health;
4     double temperature;
5     public Human(int health)
6     {
7         this.health=health;
8         this.temperature=37.0;
9     }
10    public double contact(Virus virus)
11    {
12        int threshold=virus.virulence;
13        if(virus.isCoronavirus)
14            threshold+=20;
15        if(health==threshold)
16            health-=10;
17        else if(health<threshold)
18        {
19            health-=40;
20            temperature+=1.5;
21        }
22        return temperature;
23    }
24 }
25
```

```
26 class Virus
27 {
28     boolean isCoronavirus;
29     int virulence;
30     public Virus(boolean isCoronavirus,int virulence)
31     {
32         this.isCoronavirus=isCoronavirus;
33         this.virulence=virulence;
34     }
35 }
```