

Library

B.Sc - VI

07/04/15

TYIT

Comp. Prog. & Sys. Ana. I

QP Code : 14529

(2 1/2 Hours)

[Total Marks: 75]

- N.B. (1) All questions are compulsory.
(2) Figures to the right indicate full marks.

- Q.1 (a) Attempt any **TWO** of the following questions :- (4)
(i) What are benefits of an Object Oriented approach to systems?
(ii) What are 'associations'? What are 'role names'?
(iii) Explain the 'includes' relationship between use cases.
- (b) Attempt any **TWO** of the following questions :- (6)
(i) Describe components of a class diagram.
(ii) Discuss any one stage of the classical System Development Life Cycle.
(iii) What is an information system? How are information systems classified?
- (c) Attempt any **ONE** of the following questions :- (5)
(i) Draw a class diagram for a college teacher teaching a course in a college department. Teacher has attributes : tid, tdeptno, tname, tmobno, and method dispDetails(). Course has attributes : cid, coursename. Department has attributes: did, deptname. Show multiplicity index of association.
(ii) Develop a use case diagram for the events listed below:
A lady goes to a flower shop to buy flowers. The helper in the shop shows her the flowers. He also tells her the rates. He may ask the shop owner for rate of a flower if he does not know it. The helper packs her selection of flowers and hands over to her. The lady pays the shop owner for the flowers and leaves.
- Q.2 (a) Attempt any **TWO** of the following questions :- (4)
(i) Explain two features of Java.
(ii) Explain the concept of polymorphism with an example.
(iii) Write a class Circle which has integer variable 'radius' and a constructor with a parameter.
- (b) Attempt any **TWO** of the following questions :- (6)
(i) How is an integer array created in java? Explain with an example.
(ii) How is a class defined in java? Explain which OOP (Object Oriented Programming) concept does the class incorporate?
(iii) How does a public access and a friendly access of a variable differ?

(c) Attempt any ONE of the following questions :-

- (i) Write a java program to create the following classes :
 Write class Box to define 3 instance variables l, b, h and a constructor to initialize them.
 Define instance method Volume to compute and display volume of box ($= l \cdot b \cdot h$).
 Define instance method Surface to compute and display surface area of Box ($= 2lb + 2bh + 2hl$).
 Write class BoxDemo containing main() method to test the methods of the above class.
- (ii) Write a program in Java to create the following classes :
 Class Discount with member variables integer pur_amt for Purchase Amount value and integer disc_rate for discount allowed. It has a method to initialise these variables. It also has a method to calculate & display
 $\text{float discount} = \text{disc_rate} * \text{pur_amt} / 100$ and
 $\text{float net_amt} = \text{pur_amt} - \text{discount}$.
 Class DemoDiscount with main() method tests methods of above class.

Q.3 (a) Attempt any TWO of the following questions :-

- (i) Explain the keywords 'extends'.
 (ii) What are the differences between an interface and a class?
 (iii) What is a package? Name one java package.

(b) Attempt any TWO of the following questions :-

- (i) Explain the concept of inheritance. Name the types of inheritance in Java.
 (ii) What is an abstract method? Can an abstract method belong to any class? Give one difference between an abstract method and a final method.
 (iii) What is an exception? Why is exception handling important? Give one example of exception in Java.

(c) Attempt any ONE of the following questions :-

- (i) Write a program in Java to create the following classes :
 Class FirstNumber with integer a, and a method to initialise it and a method to display divisors of a. Class DivNumber with main() method that tests methods of the above class.
- (ii) Write a program in Java that inputs two integers 'a' and 'b' from the keyboard and displays the quotient (a/b) by catching and handling the exception of division by zero.

(a) Attempt any TWO of the following questions :-

- (i) Give two differences between an Applet and an Application program.
 (ii) Write the paint() method of an applet to display the string 'SAVE WATER !' at position 50,100.
 (iii) How will you create a Frame using awt package?

- (b) Attempt any **TWO** of the following questions :- (6)
- Write statements to draw two intersecting lines.
 - Explain the method `drawRoundRect()` with an example.
 - Explain the method `setFont()` with an example.

- (c) Attempt any **ONE** of the following questions :- (5)
- Create an applet `myapplet.java` to display a rectangle filled with red color and another rectangle inside it filled with green color.
 - Create an applet `myapplet.java` using two labels and two textboxes to accept name and age of a person. Include a third label below them called 'Your choice : ' followed by two checkboxes labeled 'milkshake' and 'icecream'. The checkbox 'milkshake' should be on.

- (a) Attempt any **FIVE** of the following questions :- (15)
- What will be the values in the third row of the integer array `a[3][3]` after executing the following code in Java?

```
for (int i = 0; i < 3; i++)
    for (int j = 0; j < 3; j++)
        if ((++i % ++j) == 0)
            a[i][j] = 1;
        else
            a[i][j] = 0;
```

- State differences between class and object.
- What are the features of a subclass constructor in Java?
- Explain the concept of a final variable and a final method with examples.
- How is method overloading achieved in Java?
- Explain the term **link** with respect to a class diagram.
- Write a Java program to assign a value to a real number and print the following output on one line :
 Number: Square Root of the No: Square of the No:
- Create an applet `myapplet.java` to display the string 'COMPUTER PROGRAMMING' in font *Serif* in bold font with font size 30.