

Devi Ahilya University, Indore, India Institute of Engineering & Technology				III Year B.E. (Electronics and Telecommunication Engg.)			
Subject Code & Name	Instructions Hours per Week			Credits			
5ETRL3 SOFTWARE WORKSHOP-II	L	T	P	L	T	P	Total
	0	0	2	0	0	1	1

### Learning Objectives:

To familiarize students about Java based application programs

**Prerequisites:** Basics of Java programming

## COURSE CONTENTS

### List of Practical Assignments:

1. Write a program that finds the greatest of 4 integer numbers using ternary operator. The number values are entered by the user of the program.
2. Write a program to find factorial of a given number which is provided by the user.
3. Write a program to convert a decimal integer into binary equivalent number.
4. An audio signal is given as  $A_m \sin 2\pi (f_m t)$  amplitude modulates a carrier which is given as  $A_c \sin 2\pi (f_c t)$ . Write a program to find and display modulation index and percent modulation when  $f_m = 1500$  Hz and  $f_c = 100$  KHz. Also find and display the frequencies in the spectrum of modulated wave.
5. The numbers in the sequence 1 1 2 3 5 8 13 21.....are called as Fibonacci numbers. Write a program using do while loop to calculate and print the first m Fibonacci numbers.
6. Write a program to find and display power efficiency of AM modulated signal under the following cases: (i) over-modulation (ii) under- modulation
7. Make a program which uses a for loop to calculate and display squares and cubes of numbers from 1 to 8.
8. Write a program in which a class Circle is defined. Following methods are defined within this class to compute and display circumference and arc length of a circle: (i) circumCircle() - to compute the circumference of a circle. (ii) arcLength – to compute the length of the arc for a given angle. Write a program to compute and display circumference and arc length when the radius is 10 and angle subtended is 37 degrees.
9. Write a program using arrays to find and display the multiplication of two matrices.
10. Write a program that declares an array of the type double and finds out the square root of array elements.
11. Write a program using interfaces to calculate and display the value of bandwidth for AM, SSB and FM modulated signals. Institute of Engineering & Technology, Devi Ahilya University, Indore, (M.P.), India. (Scheme Effective from July 2019)
12. Write a program to find and display the power content of carrier, power content of each of the sidebands and total power for AM modulated signal having some percentage modulation (assume  $\mu$ ). Take the user inputs for  $\mu$  and amplitude of carrier signal.

13. Write a program using inheritance to find and display efficiency of AM system and root mean square (RMS) value of power of AM system.
14. Write a program using method overriding to find and display figure of merit for single tone AM and PM systems.
15. Make an applet program to draw filled hexagon in different colors like orange, red green etc.
16. Write a client side program to send a message to server and server program to reply back using TCP/IP protocol.
17. In a cellular system, a particular geographical area is covered by a number of cells. Each cell is assumed to be having equal size and hexagonal in shape. In each cell, a group of frequency channels are allocated. A group of cells using a different set of frequencies in each cell is called as cluster. Only a selected number of cells can form a cluster and cluster size should be 4, 7, 9, 12 etc. Write a program in which user is prompted to enter number of geographical area, channels available in a cell, radius of given cell in Km, and cluster size. The program calculates and displays the coverage area of each cell, total number of cells in a particular area, number of channels available per cell. Exception is thrown if the user enters either zero or negative value for the geographical area, radius or number of channels.

### **Learning Outcomes:**

Upon completing the course, Student would be able to:

- Write Java based application programs
- Learn to apply the concepts relating to various topics through Programming.

### **BOOKS RECOMMENDED:**

- [1] Herbert Schildt, Java The complete reference, McGraw Hill Education private limited, 2013.
- [2] Anita Seth, B.L.Juneja, Java One Step Ahead, Oxford University press, 2017.
- [3] Timothy, Budd, Object Oriented Programming, 3/E Pearson Education, 2002.
- [4] Cay S.Horstmann, Core Java, vol-1,8/E, Pearson Education, 2008.