SYLLABUS

Bachelor of Computer Applications

1st SEMESTER

Session 2020 - 2021

Mission of SCS&IT, DAVV

To produce world-class professionals who have excellent analytical skills, communication skills, team building spirit and ability to work in cross cultural environment.

To produce international quality IT professionals, who can independently design, develop and implement computer applications.

Professionals who dedicate themselves to mankind, who are environment conscious, follow social norms and ethics.

School of Computer Science & IT,
Devi Ahilya Vishwa Vidyalaya, Indore
www.scs.dauniv.ac.in

Course Name BCA 1st Semester
Subject Code: CS-1201
Subject Name: Fundamentals of Programming and Problem Solving through C-I

Aim of the Subject

Aim of this course is to understand and solve logical & mathematical problems through C language. Strengthen knowledge of a procedural programming language. Design and develop solutions to intermediate level problems using the C language. Further develop

Objectives

- To understand various steps in Program development.
- To understand the basic concepts in C Programming Language.
- To learn how to write modular and readable C Programs.
- To develop skills to solve complex and logical problems.
- To enable students for software development using C programming.
- To develop the basic programming constructs in order to easily switch over to
any other language in future.

Learning Outcomes

- Introduce the concept of a program (i.e., a computer following a series of instructions).
- Introduce the concept of an algorithm (that is, a series of steps that can be carried out in a mechanical way) and a few specific examples of algorithms (for example, finding an average, sorting, searching).
- Introduce the concept of a variable holding a value, how a variable is declared
and how it can be changed.
Introduce the concept of a loop – that is, a series of statements which is
- written once but executed repeatedly- and how to use it in a programming language.
- Be able to use a conditional statement to select a choice from two or more alternatives
- Be able to break a large problem into smaller parts, writing each part as a module or a function
- Be able to use an array to store multiple pieces of homogeneous data, and use
a structure to store multiple pieces of heterogeneous data
- Introduce the concept of Pointers Structures, Union and File handling

Unit 1

Introduction to Computer-Based Problem Solving : Problem Identification, Definition and Problem Solving Strategies. Program, Features of Good Program. Structured Programming and modular Programming, Classification of Programming Languages : Low-level, High –level language, Programming Environment : Assemblers, Compiler, Interpreter, Linker, Loader.

Program Design with Flow chart and Algorithm : Symbols in flowcharts, Importance of Flowchart, Writing algorithm, Importance of Algorithm, Developing and debugging flowchart for programming problem.

Unit 2

Fundamentals of C Programming : Overview of C, History of C, Structure of a C Program, C character set, Identifiers and Keywords, Data types, Primitive data types in C, Choosing data type, Variables and Constants, Variable declaration and initialization, Type Specifier, Constant declaration.

Operators and Expressions: Arithmetic operators, Logical operators, Relational operators, assignment operator and conditional operators, Expression, Implicit and explicit type conversion, Evaluation of expression (Precedence and Associativity).

Unit 3

Basic Input/Output Operations: Formatted I/O, printf() and scanf() functions, Unformatted I/O, getchar(),putchar(),gets() and puts() functions.

Control Constructs: Sequence Control Structure, if-else statement, switch-case statement, Loop Control Structure, while loop, do-while loop, for loop, Jump Statements, break, continue, goto, return

Unit 4

Array:Array Declaration and initialization, Array operations (like traversal, searching an element, sorting array elements), 2 D Array and multidimensional array, Declaration and initialization, Matrix operations, Advantages and limitations of Array, String

Unit 5

Function: User defined Function, Function declaration, definition and call, Actual and formal Arguments, Function with arguments and without arguments, Communication between function, Recursion, Self and Mutual recursion, Iterative vs. recursive function.

Text Book(s)

1. Herbert Schildt, C The Complete Reference, Osborne/McGraw-Hill,4th Edition,2000.

2. Behrouz A. Forouzan, Richard F. Gilberg, Computer Science: A Structured Programming Approach Using C, Thomson Brooks/cole, 3rd Edition,2007.

Reference Material(s)

1. B.W. Kernighan, D.M. Ritchie, The C Programming Language, Prentice Hall of India, 2nd Edition, 1988.
2. E Balagurusami, Programming in ANSI C, Tata McGraw-Hill, 6 th Edition, 2012.
3. Byron S Gottfried, Programming with C, Tata McGraw-Hill, 3rd Edition, 2010.
4. Yashavant Kanetkar, Let us C,BPB Publications, 13th Edition, 2013.
5. Yashwant Kanetkar, Test your C skills, BPB Publication, 5th Edition, 2005.

Course Name BCA 1st Semester
Subject Code: CS-1101
Subject Name: Mathematics-I

Aim of the Subject

To enable professional undergraduate students to understand the importance of mathematics in computer science.

Objectives

1. To make the students understand : basic concepts of differential calculus, integral calculus and its applications, differential equations, matrices, boolean algebra, fuzzy logic etc.
2.To make the students understand applications of mathematics in computer science.

Learning Outcomes

Students will come to understand the importance of mathematics in computer science.

Unit 1

Basic of calculus, Maclaurin's and Taylor's series, Partial differentiation, Euler's theorem and its application in approximation and error, Maxima and minima of two variables, tangents and normals, subtangent and subnormal, Curvature, radius of curvature, centre of curvature (Cartesian and polar co-ordinates)

Unit 2

Definite integral as limit of a sum, Application in Summation of series, Double and Triple integrals, change of order of integration, beta and gamma functions. Length of the curve, volume and surfaces, using double and triple integral.

Unit 3

Ordinary differential equation of first order, linear and higher degree, Linear higher order differential equation with constant coefficients. Homogeneous linear differential equation, simultaneous differential equations

Unit 4

Rank of matrices, solution of simultaneous equation by elementary transformation, consistency of equation. Eigen value and Eigen vectors, Cayley-Hamilton theorem and its application to find the inverse.

Unit 5

Algebra of logic, Boolean algebra, principal of duality, basis theorems, Boolean expression and function. Graph theory, Graphs, Sub-graphs, degree and distance, Tree, Cycles and Network, Elementary concept of fuzzy logic.

Text Book(s)

Engineering Mathematics I – Dr. D. C. Agarwal, Fifth Edition, Published by Shree Sai Prakashan

Reference Material(s)

1. Higher Engineering Mathematics – Dr. B. S Grewal, 36th Edition, Khanna Publishers, 2001. ISBN: 8174091157, 9788174091154
2. Higher Engineering Mathematics – B V Ramana. Tata McGraw-Hill Education, 2006, ISBN: 007063419X, 9780070634190

Course Name BCA 1st Semester
Subject Code: IC-1924
Subject Name: Hindi Language

Aim of the Subject

हिंदी भाषा और सम्प्रेषण कौशल में वृद्धि

Objectives

भाषा और सामाजिक-सांस्कृतिक चेतना से परिचित होना

Learning Outcomes

विद्यार्थी की अपनी भाषा, समाज, इतिहास, संस्कृति और प्रकृति आदि के प्रति रागात्मक दृष्टि विकसित होगी

Unit 1

(क) मानक हिंदी भाषा

(ख) अशुद्धियाँ और उनका संशोधन

Unit 2

(क) हिंदी का शब्द-भण्डार, (ख) हिंदी की वाक्य-रचना और विराम चिह्न

Unit 3

पत्र लेखन, सार-लेखन और पल्लवन

Unit 4

(क) भारत देश और उसके निवासी, (ख) भारतीय समाज की संरचना, (ग) सामजिक गतिशीलता, (घ) धर्म और दर्शन

Unit 5

(क) भातीय संस्कृति का विश्व पर प्रभाव, (ख) मध्यप्रदेश का सांस्कृतिक वैभव

Text Book(s)

भारतीयता के अमर स्वर

Reference Material(s)

मध्यप्रदेश हिंदी ग्रन्थ अकादमी, भोपाल

Course Name BCA 1st Semester
Subject Code: CS-1103
Subject Name: Physics-1

Aim of the Subject

To maximize students learning and knowledge of the subject

Objectives

1. Assignments are given to students to enable them to understand the topic better.
2. Presentation by students so that they can apply physics in the field of computer science

Learning Outcomes

Apply conceptual understanding of the physics to genral real-world situation situations

Unit 1

An ability to apply profound understanding of quantum mechanics

Unit 2

Knowledge related to the field of optics

Unit 3

To have a basic understanding of terms like nucear fission,fussion and reactors.

Unit 4

An ability to understand a free electron gas model and semiconductors

Unit 5

An ability to design a laser system and optic fibre

Text Book(s)

Engineering Physics-VS Yadav ,TMH

Reference Material(s)

Concept of modern Physics-Besier, TMH
Engineering Physics-V.S Yadav, TMH

Course Name BCA 1st Semester
Subject Code: CS-1019
Subject Name: Basic Electrical and Electronics

Aim of the Subject

The aim is that students should have knowledge of electrical and electronics

Objectives

1. Impart a basic knowledge of electrical and electronics quantities such as current ,voltage,power,energy and frequency to understand the impact of technology in a global and social context.
2. provide working knowledge for the analysis of basic AC and DC circuits.

Learning Outcomes

1. Predict the behavior of any electrical and electronics circuits
2. Formulate and solve complex AC ,DC circuits.
3. students will gain knowledge digital circuits.

Unit 1

Circuit concepts: voltage, current, power and energy, circuit, network component (active and passive, unilateral or bilateral , linear and nonlinear , lumped or distributed). Resistance parameter, inductance parameter, capacitance parameter, Series and parallel elements. Energy sources (voltage source and current source), voltage and current relations.

DC resistive circuits: Kirchhoff's voltage law, Kirchhoff's current law, Practice with Examples. Voltage Division and Current Division, Series –Parallel Network Reduction Power in a Series Circuit, Power in Parallel Circuit,

Unit 2

Network theorems : Star –Delta transformation , Ex. 1& 2 superposition theorem ,Explanation with example . Thevenin's theorem , Practice with Example maximum power transfer theorem. DC mesh and node Analysis : Mesh analysis with Example . Norton's theorem , Practice with Example. Mesh equation by inspection method. Nodal analysis, node equation by inspection method. Source transformation technique.

Unit 3

Circuit Transients: Introduction initially charged RC circuit, RL circuit with initial current. Time Constant, Equivalent RC or RL Circuits RL and RC Circuit with Sources. Series RLC Circuit: Overdamped, Critically Damped, Underdamped Condition. Example on RLC Circuit Two Mesh Circuits. Sinusoidal Circuit analysis: Introduction, sinusoidal voltage and current(instantaneous value , peak value, peak to peak value, average value, root mean square value, peak factor, form factor.

Unit 4

Element responses (phase relation in a pure resistor, inductor and capacitor). Series RL sinusoidal Response , Example. Phasors : Phasors as Complex Numbers. Series RC Sinusoidal Response , Example. Power and Power Factor : Instantaneous Power, Average Power, Apparent Power and Power Factor , Reactive Power, Power Triangle.

Unit 5

Introduction of Digital Electronics : Analog representation, Digital representation . Digital and analog systems: Advantages and Limitations of digital techniques. Digital Number Systems: Decimal system , Binary System , Binary Counting . Representing Binary Quantities, Digital Circuits/ logic circuits, Parallel and serial Transmission. Digital Computers: Block Diagram of Digital Computers, Major Part of Digital Computers. Digital Logic Gates: AND, OR, Inverter, Buffer, NAND, NOR, Exclusive-OR, Exclusive-NOR: Graphic symbol, algebraic function, Truth Table. Cascading of Gates.

Text Book(s)

1. Electric circuits, Schaum's Outline Series
2. Sudhakar and Shyammohan, Circuits and Networks, McGraw-Hill Education.

Reference Material(s)

1. B. L. Theraja,Electrical Technology, S. Chand Publication
2. D. P. Kothari and I. J. Nagrath, Basic Electrical Engineering, McGraw-Hill Education
3. M. Morris Mano, Digital Design, Third Edition, Prentice Hall

Course Name BCA 1st Semester
Subject Code: IC-1905
Subject Name: English language and Composition

Aim of the Subject

TO Improve English Language Proficiency

Objectives

To develop communicative competence and grammatical competence of the students.

Learning Outcomes

student should be able use the language effectively.
develop the language skills

Unit 1

literature
Where the Mind is Without Fear
2. A Hero
3. Tryst With Destiny
4. Indian Weavers
5. The Portrait of a Lady
6. The Solitary Reaper

Unit 2

Basic Language Skills:
Countable and Uncountable Nouns,
Verbs, types of verbs
Tenses,
determiners,
adjectives
Adverbs
prepositions
conjunctions

Unit 3

Basic Language Skills,
Vocabulary: Synonyms, Antonyms,
Word Formation, Prefixes, Suffixes,
Confusing Words, Misused Words,
Similar Words with Different Meanings

Unit 4

sentence , hierarchy of sentence, phrases, types of phrases, classification of sentence based on function and structure, parts of sentences

Unit 5

Composition and Paragraph Writing, types of paragraph, descriptive paragraph

Text Book(s)

Text Book: English Language and Literary Heritage of India, Foundation course (English Language) Published by Commission for Scientific and Technical Terminology and M P Hindi Granth Academy Edition first (2017)

Reference Material(s)

English usage- Michael swan, English grammar and composition Wren and martin

Lab Manual

Fundamentals of Programming and Problem Solving through C - 1

1. Write a C program to display "Hello Computer" on the screen.
2. Write a C program to display Your Name, Address and City in different lines.
3. Write a C program to find the area of a circle using the formula: Area = PI * r*r.
4. Write a C program to find the area and volume of sphere. Formulas are:
   Area = 4*PI*R*R Volume = 4/3*PI*R*R*R.
5. Write a C program to print the multiply value of two accepted numbers.
6. Write a C program to convert centigrade into Fahrenheit. Formula:
   C= (F-32)/1.8.
7. Write a C program to swap variable values of i and j.
8. Write a C program to find the maximum from given three nos.
9. Write a C program to find that the accepted no. is Negative, Positive or Zero.
10. Write a C program to calculate sum of 5 subjects & find percentage.
11. Write a C program to use switch statement. Display Monday to Sunday.
12. Write a C program to display arithmetic operator using switch case.
13. Write a C program to print month from January to December using switch case.
14. Write a C program to reverse a given number.
15. Write a C program to print a table of any number.
16. Write a C program to find out the sum of series 1 + 2 + …. + n.
17. Write a C program to find out the sum of series 1^2 + 2^2 + …. + n^2.
18. Write a C program to display first 10 natural no & their sum.
19. Write a C program to print Fibonacci series up to 100.
20. Write a C program to find factorial of a number.
21. Write a C program to find whether given no is a prime no or not.
22. Write a C program to display sum of series 1+1/2+1/3+.....+ 1/n.
23. Write a C program to use bitwise AND operator between the two integers.
24. Write a C program to convert decimal to binary.
25. Write a C program to convert decimal to octal.
26. Write a C program to convert decimal to hexadecimal.

27. Write a C program to find the sum of first 100 natural nos.
28. Write a C program to find the sum of first 100 odd nos. and even nos.
29. Write a C program to display first 25 Fibonacci nos.
30. Write a C program to display first 100 prime nos.
31. Write a C program to find the sum of digits of accepted no.
32. Write a C program to print all the factors of accepted no.
33. Write a C program to find all the prime numbers between two given numbers.
34. Write C programs to print the terms of each of the following series:
    i. Sin(x) ii. Cos(x) iii. Log (1+x) iv. log (1-x) v. ex vi. e-x
35. Write a C program to print the sum of series.(will be given in class)
36. Display the following output on screen (assuming the value for input parameter n=5) :

a.	b.	c.	d.	e.
*	1	A	1	1
**	12	AB	23	2 3
***	123	ABC	345	4 5 6
****	1234	ABCD	4567	7 8 9 10
*****	12345	ABCDE	56789	11 12 131415
f.	g.	h.	i.	j.
*****	ABCDE	*	1	1
****	ABCD	***	123	121
***	ABC	*****	12345	12321 1234321
**	AB	*******	1234567	123454321
*	A	*********	123456789	

k.	l.	m.	n.	o.
* ** *** **** *****	ABCDE ABCD ABC AB A	1 12 123 1234 12345	***** 0000 *** 00 *	1 10 101 1010 10101
p. 1 01 101 0101 10101	q 1 22 333 4444 55555	r. A AB ABC AB A	s. ABCDEDCBA ABCD DCBA ABC CBA AB BA A A	t. 1 121 12321 1234321 123454321
u. *	v. 1 2 3 4 5 2 3 4 5 1 3 4 5 1 2 4 5 1 2 3 5 1 2 3 4	w. 5 4 3 2 1 4 3 2 1 3 2 1 2 1 1	x. * * * * * * * * * * * * * * *	y. 1 2 3 4 5 1 5 1 5 1 5 1 2 3 4 5

37. Write a C program to find minimum, maximum, sum and average of the given one dimensional array.
38. Write a C program to perform the basic Matrix operations as addition, subtraction, multiplication, Transpose.
39. Write a C Function for the following task.
    a. Calculating Factorial
    b. Find value of a given Fibonacci term
    c. Swapping the values of two variable

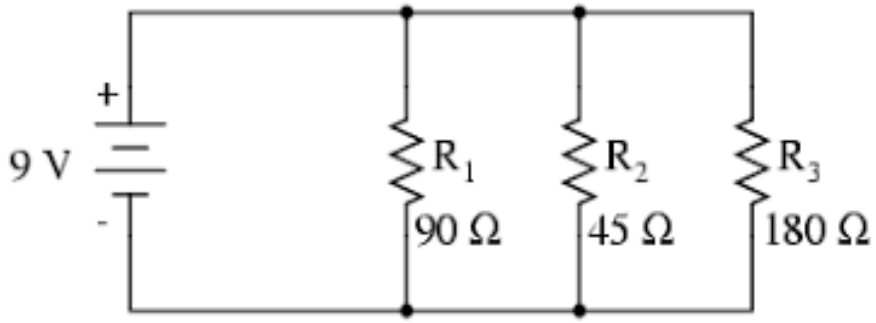
d. Minimum/maximum value from the given input

40. Write the following recursive C Function
    a. Factorial of a given number
    b. N th Fibonacci number
    c. Reverse of a give Number

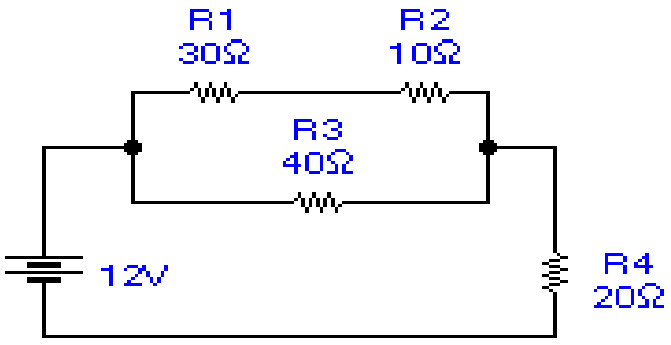
Assignment: CS-1019 Basic Electricals and Electronics

Question 1:- **consider a parallel circuit which consists of three resistors with resistance 5Ω, 10Ω, 5Ω respectively with a 15v battery.**

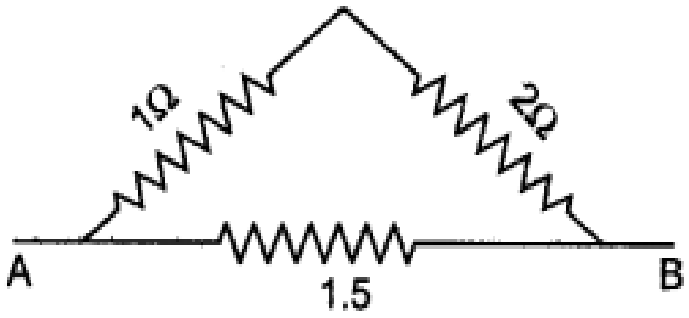
Question 2:- **calculate current I**

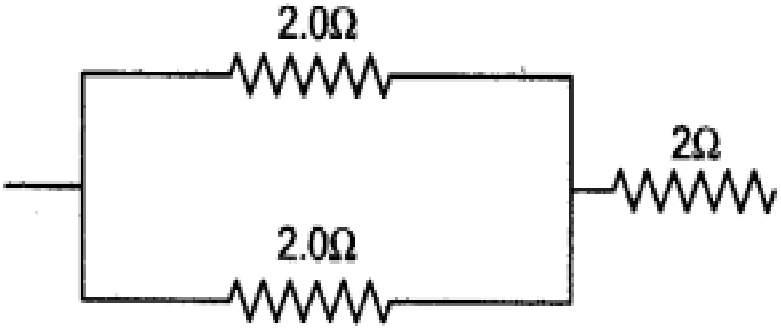


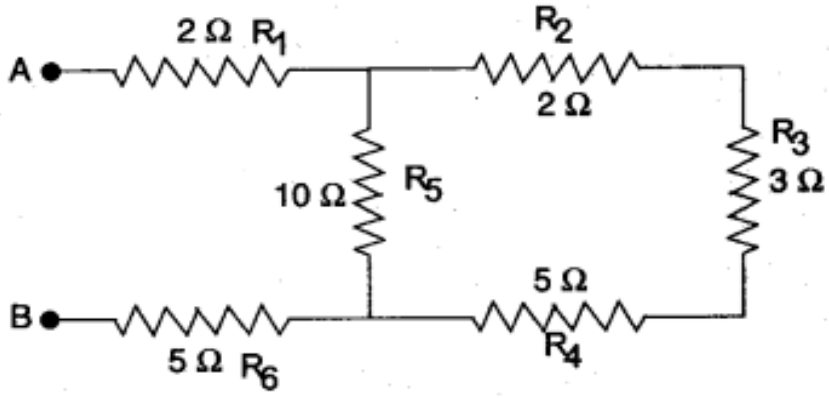
Question 3:- calculate current I

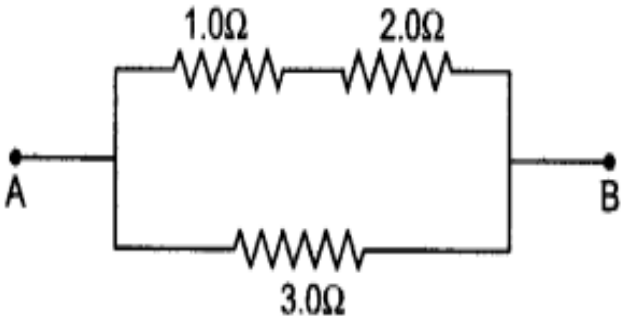


Question 4:- In given figure , calculate the effective resistance between the points A and B




2.0Ω
2Ω
2.0Ω


2 Ω R1
R2
A
2 Ω
R3
3 Ω
10 Ω
R5
5 Ω
B
5 Ω R6
R4


1.0Ω
2.0Ω
A
B
3.0Ω