K.S.R. COLLEGE OF ENGINEERING: TIRUCHENGODE – 637215.
(Autonomous)
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE / LESSON PLAN SCHEDULE

NAME : C.KARTHIK
CLASS : I-B.E. ECE
SUBJECT CODE / NAME : 18CS041 / PROGRAMMING FOR PROBLEM SOLVING

A). TEXT BOOK:

1. Herbert Schildt, "C-The Complete Reference", Tata McGraw-Hill, 2013.
2. Dromey R.G., How to Solve it by Computer, Pearson Education, India, 2008.

B). **REFERENCE BOOKS:**

1.Ashok N.Kamathane, Computer Programming, Pearson Education, 2014
2.PradipDey, ManasGhosh, Fundamentals of Computing and Programming in C, 1st Edition, Oxford University Press, 2013.
3.Anita Goel and Ajay Mittal, Computer Fundamentals and Programming in C, Dorling Kindersley India Pvt. Ltd., Pearson Education in South Asia, 2011.
4.Yashavant P. Kanetkar, Let Us C, BPB Publications, 2011.
5.Nptel.ac.in/courses/106104128

C). LEGEND:

L	- Lecture	PPT	- Power Point
T	- Tutorial	BB	- Black Board
OHP	- Over Head Projector	pp	- Pages
Rx	- Reference	Ex	- Extra

Sl. No	Lecture Hour	Topics to be covered	Teaching Aid Required	Book No./ Page No.
UNIT-I BASICS OF COMPUTER AND PROBLEM SOLVING				
1	L1	Generations Of Computers	BB	Tx1/7-10 Rx1/1.6-1.9
2	L2	Classification of Computers	BB	Tx1/10-13 Rx1/1.9-1.12
3	L3	Organization of digital computer	PPT +BB	Tx1/15-18 Rx1/1.15-1.20
4	L4	Categories of Software	BB	Tx1/56-65 Rx1/2.22-2.25
5	L5	Software Development Life Cycle	BB	Tx1/42-43 Rx2/8.1-8.20
6	L6	Number System and its Conversions	OHP+BB	Tx1/18-25 Rx1/2.5-2.13
7	L7	Representation of an Algorithm: Pseudo code, flow chart with examples	BB	Tx1/78-79 Rx1/2.27
8	L8	Steps in Problem Solving	BB	Tx1/83-85 Rx1/2.30-2.32

9	L9	Problem Solving Strategies	BB	Tx1/79-83 Rx1/2.28-2.30
UNIT- II C PROGRAMMING BASICS				
10	L10	Fundamentals – Structure of a 'C' program	BB	Tx1/260-261 Rx1/3.16-3.18
11	L11	Compilation and Linking processes	BB	Tx1/261-265 Rx1/3.18-3.19
12	L12	Constants, Variables	BB	Tx1/273-275 Rx1/3.12-3.16
13	L13	Data Types	BB	Tx1/276-277 Rx1/3.8-3.12
14	L14	Operators – Expressions	BB	Tx1/291-309 Rx1/4.2-4.18
15	L15	Managing Input and Output operations	BB	Tx1/315-334 Rx1/4.27-4.32
16	L16	Decision Making and Branching	BB	Tx1/341-364 Rx1/5.9-5.22
17	L17	Looping statements	BB	Tx1/373-403 Rx1/5.23-5.32
18	L18	Solving simple scientific and statistical problems	BB	Tx1/367-407 Rx1/5.45-5.54
UNIT – III ARRAYS AND STRINGS				
19	L19	Arrays: Initialization, Declaration	BB	Tx1/481-483 Rx1/6.1-6.5
20	L20	One dimensional arrays	BB	Tx1/483-489 Rx1/6.6-6.11
21	L21	Two dimensional arrays	BB	Tx1/491-495 Rx2/298-309
22	L22,L23	String: String Operations	BB	Tx1/519-524 Rx1/7.22-7.24
23	L24	String Arrays	BB	Tx1/524-540 Rx1/7.25-7.27
24	L25	Simple programs: sorting	BB	Tx1/490,507 Rx1/6.38-6.57
25	L26	Searching	BB	Tx1/505 Rx1/6.31-6.38
26	L27	Matrix operations	BB	Tx1/491-495 Rx2/306
UNIT - IV FUNCTIONS AND POINTERS				
27	L28	Function: Declaration, Definition	BB	Tx1/415-420 Rx2/8.4-8.9
28	L29	Categories	BB	Tx1/422-428 Rx2/8.10-8.16
29	L30	Pass by value ,Pass by reference	BB	Tx1/428-430 Rx2/8.19-8.21
30	L31	Recursion	BB	Tx1/450

				Rx2/8.28-8.37
31	L32	Pointers: Definition , Initialization	BB	Tx1/581-585 Rx2/6.12-6.17
32	L33	Pointers arithmetic	BB	Tx1/586-588 Rx2/6.17-6.21
33	L34	Pointers to Pointers	BB	Tx1/594-595 Rx2/6.30
34	L35	Pointers and arrays	BB	Tx1/588-589 Rx1/6.30-6.31
35	L36	Example Problems	BB	Tx1/600l
UNIT – V STRUCTURES AND UNIONS				
36	L37	Structures: declaration – Definition	BB	Tx1/617-620 Rx1/9.4-9.29
37	L38	Structure within a structure	BB	Tx1/620-622 Rx1/9.29-9.31
38	L39	Union	BB	Tx1/631-632 Rx1/9.38-9.41
39	L40	Programs using structures	BB	Tx1/623-626 Rx1/9.32
40	L41	Programs using Union	BB	Tx1/632 Rx1/9.40
41	L42	Storage classes	BB	Tx1/467-473 Rx1/10.2-10.9
42	L43,L44	Pre-processor directives	BB	Tx1/551-567 Rx1/10.14-10.34
43	L45	Files	BB	Rx2/429-441 Tx2/689-731

UNIT – I: BASICS OF COMPUTER AND PROBLEM SOLVING

PART – A

1. Define Computer (Remembering) (CO1)

A Computer is an electronic device that performs diverse operations with the help of instructions to process the information in order to achieve desired results**. (OR)**

A Computer is an electronic machine, devised for performing calculations and controlling operations that can be expressed either in logical or numerical terms.

2. Illustrate the Data (Understanding)(CO1)

Data is the facts about anything whatever we call them, or it is raw materials of information processing. It does not have any implicit meaning. Examples: 25, 567.78 are numbers; Ganesh, John is names.

3. Discuss Information (creating) (CO1)

The processed data is called information, and the data or information comes in various shapes or sizes depending upon the applications. Computer can store, process and retrieve such data or information as and when required. It has an implicit meaning. Examples: Date: 01/09/2008; Name: Priya.

4. List the basic operations of a Computer? (Remembering) (CO1)

The computer performs the following five basic operations such as Input, Process, Output, Storing, and Controlling.

5. Discuss about Input? (creating) (CO1)

Input is the process of capturing or acquiring the information, or it is the raw data. By using this we can do any process.

6. What is meant by Controlling? (Remembering) (CO1)

Controlling is the process of directing the manner and sequence in which all the operations are to be performed.

7. Name the characteristics of Computer? (or) List the factors needed to classify the computers (Remembering)(CO1)

The characteristics of the computers are Speed, Accuracy, Diligence, Reliability, Storage capability, Versatility, Resource sharing.

8. List out the applications of Computer? (Analyzing) (CO1)

The main application areas in which, computer are used.

Education ,Scientific Research ,Business Application, Banking Medicine and Health care, Engineering/ Architecture, Manufacturing / Industrial Applications, Entertainment, Communication, Transportation.

9. What is meant by Laptop Computer? (Remembering) (CO1)

A laptop is portable computer that is a user can carry it around. Since the laptop computer resembles a notebook, it is also known as *Notebook.* A laptop computer is that one can use this computer anywhere and at anytime, especially, when one is traveling.

10. Specify the reasons to use Computers. (Evaluating) (CO1)

Because of the following reasons the computers are become a part of day. Today in the life of human being computers are used, where accuracy to be improved, where delays are to be minimized, where high volume data are required to be stored, where efficiency and economy is required, where constants and permanent operations are to be done.

11. Expand ENIAC, ABC, EDVAC, EDSAC, and UNIVAC. (Evaluating) (CO1)

ENIAC – Electronic Numerical Integrator and Calculator
ABC - Atanasoff and Berry Computer
EDVAC - Electronic Discrete Variable Automatic Computer
EDSAC – Electronic Delay Storage Automatic Calculator
UNIVAC – Universal Automatic Computer

12. Expand the COBOL, BASIC, FORTRAN and IBM(Evaluating) (CO1)

COBOL – Common Business Oriented Language
BASIC – Beginners All Purpose Symbolic Instruction Code
FORTRAN – Formula Translation
IBM – International Business Machines

13. Recall Stored Program Concept? (Remembering) (CO1)

Stored Program Concept is the storage of instructions in computer memory to enable it to be performing a variety of tasks in sequence.

14. Compare the Computers with Calculator. (Analyzing) (CO1)

S.No	Characteristics	Calculator	Computer
1.	Speed	Fast	Much fast
2.	Performance	Simple calculation and numeric processing	Complex problem and non-numeric processing.
3.	Memory	Less internal memory and no permanent storage, temporary storage only.	Large internal memory and large permanent storage available.
4.	Machine	Electronic device	Electronic device
5.	Operation	Arithmetic	Arithmetic and logical.

15. Who is the Father of computer and Why? (Remembering) (CO1)

Charles Babbage is the father of computer, because the parts and working principle of the Analytical Engine, who is invented by Charles Babbage is similar to today's computer.

16. Summarize some of the popular Microprocessor manufactures. (Understanding)(CO1)

The most popular Microprocessor manufactures are INTEL, Zelog, AMD, CYREX, etc…

17. Importance of Stored Program Concept? (Evaluating) (CO1)

The Main advantage of stored program concept is a program to be electronically stored in binary –number format in memory device, so that instructions could be modified by the computer as determined by intermediate computational results.

18. How EDVAC was different from ENIAC? (Remembering) (CO1)

EDVAC was different from ENIAC in two fundamental ways,

i. Use of Binary numbers for electronic arithmetic operations.

ii.The Internal storage of instructions was written in digital forms.

19. What are the different generations of computer? Sep-09(CO1) (Remembering)

There are five different generations of computer such as First generation, Second generation, Third generation, Fourth generation and Fifth generation.

20. Develop the Characteristics of First Generation Computers? (Creating) (CO1)

- Machine language was used, They lacked in versatility and speed, These computers were based on vacuum tube technology, These computers were non-portable and very slow equipments, These computers were very large and required a lot of space for installation, These computers were the fastest computing devices of their times (calculation time was in milliseconds).

21. Explain the Characteristics of Second Generation Computers? (Analyzing) (CO1)

- These machines were based on transistor technology.
- These were smaller as compared to the first generation computers.
- The computational time of these computers was reduced to microseconds from milliseconds.
- These were more reliable and less prone to hardware failure. Hence, such computers required less frequent maintenance.
- These were more portable and generated less amount of heat.
- Assembly language was used.

22. Demonstrate the Characteristics of Third Generation Computers? (Understand) (CO1) (Jan 2013)

- These computers were based on integrated circuit(IC).
- They were able to reduce computational time from microseconds to nanoseconds.
- They were easily portable and more reliable than the second generation.
- Extensive use of high-level language became possible.
- Commercial production became easier and cheaper.
- The size of the computers was smaller as compared to previous computers.

23. Explain the Characteristics of Fourth Generation Computers? (Evaluating) (CO1)

- Fourth generation computers are microprocessor-based system.
- These computers are very small.
- Fourth generation computers are the cheapest among all the other generations.
- They are portable and quite reliable.
- The production cost is very low.
- GUI and pointing devices enables users to learn to use the compute quickly.

24. What are the Characteristics of Fifth Generation Computers? (Remembering) (CO1)

- The use of VLSI and artificial intelligence concept is used in the generation of computers.
- They will be able to take commands in a audio visual way and carry out instructions.
- Mega chips may enable the computer to approximate the memory capacity of the human mind.
- Computer using parallel processing accesses several instructions at once and works on them at the same time through use of multiple central processing units.
- Artificial Intelligence comprises a group of related technologies: Expert system (ES), Natural Language Processing (NLP), Speech Recognition, Vision Recognition and Robotics.

25. Tell about Artificial Intelligence (AI)? (Remembering) (CO1)

Artificial Intelligence (AI) refers to a series of related technologies that tries to simulate and reproduce human behavior, including thinking, speaking, and reasoning. AI comprises a group of related technologies: Expert System (ES), Natural Language Processing (NLP), Speech Recognition, Vision Recognition and Robotics.

26. Outline Expert System. (Understanding) (CO1)

The Expert System is defined as a computer information system that attempts to mimic the thought process and reasoning of experts in specific areas.

27. What are the advantages and disadvantages in First Generation Computers? (Remembering) (CO1)

Advantage:

- Vacuum tubes were the only electronic components available at that time.
- This technology made possible the advent of electronic digital computers.

- ❖ These computers were the fastest calculating device of their time.
- ❖ These computers could perform computations in milliseconds.

Disadvantage:

Very big in size, High heat production, High power consumption, High cost, No reliability, Non portable.

28. Make use of Second Generation Computers? (Applying) (CO1)

Advantage:

Small in size, Better reliability, Less heat generated, Better speed, Computational time is microseconds.

Disadvantage:

Frequent maintenance required, Need Air conditioning, High cost, Manual Assembly of individual components into a functioning unit was required, Commercial production was difficult.

29. Explain the advantages and disadvantages in Third Generation Computers? (Understanding) (CO1)

Advantage:

Small in size, More reliability, Less heat generated, Less Hardware failure, Less power required, Easily portable, Computational time is nanoseconds.

Disadvantage:

Need Air conditioning, highly sophisticated technology required for the manufacture of IC chips.

30. Justify the advantages and disadvantages in Fourth Generation Computers? (Evaluating) (CO1)

Advantage:

These computers were much smaller in size, Very cheap as compared with previous generation computers, Consumed less power, These are general purpose computer, Object Oriented Language is supported.

Disadvantage:

Highly sophisticated technology required for the manufacture of LSI chips.

31. What are the advantages in Fifth Generation Computers? (Remembering) (CO1)

Advantage:

The super computers fall under this generation, Portable PC's also fall under this generation, more users friendly, Support wide operating system environment.

32. Classify the computers. (Understanding) (CO1)

The computers are classified into the following categories.

Based on Hardware design

Analog, Digital, Hybrid, Based on Utility, General purpose computer, Special purpose computer

Based on Size and Capacity

Micro computer, Minicomputer, Mainframe computer, Super computer

Based on Mode of use: Palmtop PCs, Laptop PCs, Personal computer, Work station, Mainframe system, Clients and Server

33. Build the Analog Computer? (Applying) (CO1)

Analog is a Greek word means similar. In analog computer, input data is continuously changing electrical or non - electrical information. Computations are carried out with physical quantities such as voltage, length, current, temperature etc...And also the devices measuring such quantities are called as analog devices.

34. Contract the Characteristics of Analog computer? (Analyzing) (CO1)

It operates by measuring, It functions on continuously varying quantity, The output is usually represented in the forms of graphs, The calculations are first converted into equations and later converted into electrical signals, It is not versatile i.e., it has limited applications and not suitable for business and industry, It has limited memory space.

35. Define Digital Computer? (Remembering) (CO1)

The digital computer with quantities represented as digits. In digital computer, numeric and non-numeric information's are represented as strings of digits. And the input data is discrete in nature. It is represented by binary notation in the form of 0's and 1's.

36. Estimate the Characteristics of Digital computer? (Evaluating) (CO1)

It operates by counting, It functions on discrete numbers, The calculations are converted into binary numbers, The output is represented in the form of binary numbers, Its accuracy is good, It is versatile in nature and is suitable for business applications, It has large memory space.

37. Difference between Analog and Digital Computers. (Understanding) (CO1)

Analog Computer	Digital Computer
It operates by measuring.	It operates by counting.
It requires physical analog.	It functions on discrete numbers.
The calculations are first converted to equation and later converted into electrical signals.	The calculations are converted into binary numbers (1's and 0's).
The output is in the form of graph.	The output is in the form of discrete values.
Less accurate.	More accurate.
Less speed.	More speed.

38. Tell about Hybrid Computer? (Remembering) (CO1)

The measuring functions are performed by the analog way while control and logic functions are digital in nature is known as hybrid computer. Examples: Weather – monitoring systems and devices used in Intensive Care Units of the hospitals.

39. Create the General Purpose Computer and Give examples? (Creating) (CO1)

General purpose computer are designed and constructed to cater almost all the needs of the society. They can perform various operations. They are able to perform according to the programs created to meet different needs. Examples: financial accounting to mathematical calculations, from designing textile prints to controlling machinery.

40. Discover Special Purpose Computer and Give examples? (Analyzing) (CO1)

Special purpose computer can be designed to perform specific functions. In such devices, the instructions are permanently pre programmed. The instructions needed to perform the particular task are incorporated into the internal memory of the computer. Examples: aircraft control system, electronic voting machines etc.

41. What is meant by Micro Computer? (Remembering) (CO1)

A micro computer is a small, low cost digital computer, which usually consists of a microprocessor, a storage unit, an input and output channel, all of which may be on one chip inserted into one or several PC boards. And also micro computers include desktop, laptop, and hand-held models such as PDAs (Personal Digital Assistances). Examples: IBM-PC, Pentium 100, IBM-PC Pentium 200 and Apple Macintosh

42. Recall the Desktop Computer? (Remembering) (CO1)

Desktop computer, also known as *Personal Computer (PC)*, is principally intended for stand-alone use by an individual. These micro computers typically consist of a system unit, a display monitor, a keyboard, internal hard disk storage, and other peripheral devices.

43. Criticize the Hand-Held Computer? (Evaluating) (CO1)

A hand-held, also called Personal Digital Assistant (PDA) is a computer that can conveniently be stored in a pocket (of sufficient size) and used while the user is holding it. A PDA user generally uses a pen or electronic stylus, instead of a keyboard for input. PDAs are essentially small portable computers and these computers can be easily fitted on the palm, they are also known as *palmtop computers.* Examples: Apple Newton, Casio Cassiopeia

44. List out advantages and disadvantages of micro computer? (Analyzing) (CO1)

Advantages:

They are small and portable, They are relatively inexpensive, They do not occupy much space, They do not consume much power

Disadvantages:

They are relatively slow; its storage capacity is low.

45. What is meant by Mini Computers? (Remembering) (CO1)

A minicomputer is small digital computer which is normally able to process and store less data than a mainframe but more than a micro computer. Minicomputer are sometimes called a *mid-range computer* is designed to meet the computing for several people simultaneously in a small to medium – sized business environment. Examples: PDP 11, IBM (8000 series) and VAX 7500.

46. Classify the advantages and disadvantages of minicomputers? (Understanding) (CO1)

Advantages:

It is a general purpose computer, Its storage capacity is about 2 Mega words, Its word lengths are usually 12, 16, 24 or 32 bits, It can support many terminals i.e., more than 20 terminals, It is relatively inexpensive.

Disadvantages:

They are slower when compared with main frame computers; the memory of mini computers is smaller than mainframes.

47. Develop the mainframe computer? Give the name of few mainframe computers? (Applying)(CO1)

A mainframe computer is an ultra-high performance computer made for high-volume, processor-intensive computing. It is mainly used for large volumes of data processing, high performance online transaction processing system, and extensive data storage and retrieval.

Examples: IBM's ES000, VAX 8000 and CDC 6600.

48. List out the advantages of mainframe computer? (Analyzing) (CO1)

Advantages:

They are capable of handling all tasks, they require large room space, Consumption of electricity is very high, and Maintenance cost is also very high.

49. What is meant by super computers? (Remembering) (CO1)

Super computers are the special purpose machines. These are unique and parallel architectures in order to achieve high speeds and being effective on a small range of problems. Super computer are used to solve multi-variant mathematical problems of existent physical processes, such as aerodynamics, metrology and plasma physics.

Examples: CRAY-3, Cyber 205 and PARAM.

50. What are the advantages of supercomputer? (Remembering) (CO1)

Advantages: They are fastest and most powerful computer, they are several processors working simultaneously, they process at a rapid speed, They have more main memory, They have operations done in parallel, rather than sequentially.

51. Relate Clients and Servers. (Understanding) (CO1)

A **client** is a generally a single –user PC or work station that provides a highly user-friendly interface to the end user. It runs client process, which send service requests to the server.

A **server** is generally a relatively large computer that manages a shared resource and provides a set of shared user services to the clients. It runs the server process, which services client requests for use of the resources managed by the server. The network may be a single LAN or WAN or an internet of networks.

52. Justify the Hardware? (Evaluating) (CO1)

Hardware refers to the physical parts of the computer system and also refers to all visible devices that are assembled together to build a computer system. These include various input devices, central processing unit, output devices and memory.

53. What is meant by software?(Remembering) (CO1)

Software refers to the set of instructions or programs that are necessary for the functioning of a computer to perform certain tasks.

54. Illustrate the basic components of the computer hardware systems? (Understanding) (CO1)

The Basic components of the computer systems are Input Unit, Central Processing Unit, Secondary Storage Unit, and Output Unit.

55. Apply the Input device and also list out various Input devices? (Applying) (CO1)

Input devices are electromechanical devices that allow the user to feed information into the computer for analysis, storage and to give commands to the central processing unit. Input devices can be connected to the computer system using cables. The most commonly used input devices are, Keyboard, Mouse, Scanner and Joystick

56. What are the output device and also list out various Output devices?(Remembering) (CO1)

Output devices take machine-coded output results from the CPU and convert them into a form that is easily readable (such as characters, graphical, or audio visual) by human beings. They are used

for providing the output of a program that is obtained after performing the operations specified in program. The commonly used output devices are, Monitor, Printer, Speaker and Plotter

57. Contract the operations of CPU? (Analyzing) (CO1)

The Central Processing Unit is the "Brain" of the Computer System, which has controlled over other units. It has three subunits they are the Arithmetic /logic Unit (ALU), the Control Unit (CU), and the Memory Unit (MU).

58. Contract the functions of CPU? (Creating)(CO1)

Its main function is its controls all internal and external devices, performs arithmetic and logic operations, and operates only on binary data that is data composed of 1s and 0s. It's also controls the usage of main memory to store data and instructions, and control the sequence of operations.

59. Importance of ALU.(Evaluating)(CO1)

ALU process the arithmetic calculations and logical operations. Then they controls direct a memory unit to supply data to the ALU results obtained are given back to memory and they are retained for future retrieval.

60. Relate the Memory and its classifications? (Understanding) (CO1)

Memory refers to the electronic place of holding instructions and data some data will require instantaneously will others may not be needed for extended periods.

- Memory is classified into two types, Primary Memory ,Secondary Memory

61. Build the Primary Memory (Applying) (CO1)

Primary memory is a part of CPU. Storage capacity is limited. It consists of magnetic core or semiconductor cells. It is a temporary storage place used for storing a program and limited data at a time of processing. This is also known as main memory or primary storage. It has two types of primary memory, Random Access Memory (RAM), Read Only Memory(ROM)

62. Show the RAM and its type? (Understanding) (CO1)

RAM allows the computer to store data for immediate manipulation and to keep track of what is currently being processed. RAM is volatile in nature, that is, when the computer is turned off, RAM loses its data. RAM is two types, they are: Static RAM (SRAM), Dynamic RAM (DRAM)

63. What is SRAM? (Remembering) (CO1)

SRAM stands for Static Random Access Memory. It retains data as long as power is provided to the memory chip and does not require constant periodic refreshing.

SRAM is further divided into three types, they are; Asynchronous SRAM, Burst SRAM, Pipeline Burst SRAM

64. Outline about DRAM? (Understanding) (CO1)

DRAM stands for Dynamic Random Access Memory. It retains data as long as power is provided to the memory chip and does require constant periodic refreshing. They are slower and less expensive than SRAM.

65. What are ROM and its types? (Applying) (CO1)

ROM is Non-volatile memory, that is, when the computer is turned off, the content of the ROM remain available. It is suitable for long-term storage of information, and off-line storage.

ROM is five types, they are: Masked ROM, Programmable ROM (PROM), Erasable Programmable ROM (PROM), Electrically Erasable Programmable (EEPROM), Flash ROM.

66. Theme of Cache memory? (Analyzing) (CO1) (Jan 2014)

Cache memory is random access memory (RAM) that a computer microprocessor can access more quickly than it can access regular RAM. As the microprocessor the processes data, it looks first in the cache memory and if it finds the data there (from a previous reading data), it does not have to do the more time-consuming reading of data from larger memory.

67. Explain Secondary memory (Creating) (CO1)

Secondary memory is also known as auxiliary memory; secondary memory provides backup storage for instructions (software programs) and data. The most commonly used secondary devices are hard disk, magnetic tapes, and magnetic disk.

68. Construct Registers (Evaluating) (CO1)

Registers are special-purpose, high-speed temporary memory units that hold various types of information such as data, instructions, address, and the intermediate results of calculation.

69. Show Program counter (Understanding) (CO1)

Program counter are certain instructions that can tell the CPU to jump to another set of instructions that are not next in the sequence.

70. Develop the Storage devices? (Applying) (CO1)

A device capable of storing data. The term usually refers to mass storage devices, such as disk tape drives. They have three most common disk drives. Eg:Hard disk, Floppy disk, CD-ROM

71. Distinguish between static RAM and dynamic RAM (Analyzing) (CO1)

Static RAM	Dynamic RAM
Retain its contents as long as power is available.	It has short data life.
Constantly maintained data.	Need to be refreshed to maintain data in it.
Less number of chips used.	More number of chips used.
Very fast.	Slow as compared to SRAM.

72. Compare RAM and ROM. (Understanding) (CO1)

ROM	RAM
It is a non volatile memory.	It is volatile memory.
The contents are permanent.	The contents are temporary.
Cost effective.	Cost is Very high.
Available in high storage capacity.	Small Storage capacity.
Processing speed is low.	Processing speed is high.

73. What is motherboard? (Remembering) (CO1)

All the electronic components in a Pc are mounted on a printed circuit board (PCB) called the motherboard.

74. Develop the conversion in number system? (Creating) (CO1)

Conversion is the process of converting one number system to another and vice versa.

75. Define BIT, Nibble, Byte and Kilobyte. (Remembering) (CO1)

A Bit is a Binary Digit, either o or 1, A Nibble is a combination of four bits.

A Byte is a sequence of 8 bits or 2 nibbles, A Kilobyte comprises the 1024bytes

76. Convert binary to hexadecimal number. (Applying) (CO1)

a) Group the given binary number in four bits per groups from right to left.

b) Write the equivalent hexadecimal value for each group.

77. Why computer is called an idiotic genius? (Remembering) (CO1)

Computer can carry out any task much faster than a human being. Computer cannot think of its own and it can duly perform the instructions given by the human being.

78. Find the octal equivalent of the number $(10111001100.1101011)_2$)(Remembering)(CO1)

010 111 001 100.110 101 100

2 7 1 4 . 6 5 4

Octal number is $(2714.654)_8$

79. Write first ten numbers in Radix 4 number system (Applying) (CO1)

The Radix 4 number system will contain only 4 literals excluding the number 4. The literals in Radix 4 system are 0, 1, 2 and 3.

The first ten numbers of Radix 4 number system are 0, 1, 2, 3, 10, 11, 12, 13, 20 and 21.

80. Translate the binary number $(1010.011)_2$ to decimal system (Understanding)(CO1)

$(1010.011)_2 = 1 \times 2^3 + 0 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 + 0 \times 2^{-1} + 1 \times 2^{-2} + 1 \times 2^{-3} = (10.375)_{10}$

81. Convert octal number $(630.4)_8$ to decimal system. (Applying) (CO1)

$(630.4)_8 = 6 \times 8^2 + 3 \times 8^1 + 0 \times 8^0 + 4 \times 8^{-1} = (408.5)_{10}$

82. What is the binary number 101110 to decimal system. (Applying) (CO1)

$(101110)_2 = 1 \times 2^5 + 0 \times 2^4 + 1 \times 2^3 + 1 \times 2^2 + 1 \times 2^1 + 0 \times 2^0 = 32 + 0 + 8 + 4 + 2 + 0 = (46)_{10}$

83. Find the binary number 1110101.11 to decimal system. (Applying) (CO2)

$(1110101.11)_2 = 1 \times 2^6 + 1 \times 2^5 + 1 \times 2^4 + 0 \times 2^3 + 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 + 1 \times 2^{-1} + 1 \times 2^{-2}$

= 64 + 32 + 16 + 0 + 4 + 0 + 1 + 0.5 + 0.25 = $(117.75)_{10}$

84. Convert the octal number $(7562.45)_8$ to binary system. (Applying) (CO1)

7562.45 = 111 101 110 010. 100 101 Binary number = $(111101110010.100101)_2$

85. Change the decimal number $(0.513)_{10}$ to octal. (Applying) (CO1)(Jan 2013)

0.513 x 8 = 4.104||0.104 x 8 = 0.832||0.832 x 8 = 6.656

0.656 x 8 = 5.248||0.248 x 8 = 1.984||0.984 x 8 = 7.872

The answer is obtained from the integer parts of the products.

$(0.513)_{10} = (0.406517..)_8$

86. Translate the octal number $(10752)_8$ to hexadecimal number (Understanding)(CO1)

To convert octal number to hexadecimal, the conversion can be done through binary system.

$(10752)_8 = (001\ 000\ 111\ 101\ 010)_2$

$(001000111101010)2 = 0001\ 0001\ 1110\ 1010$

= 1 1 E A, Hexadecimal number = $(11EA)_{16}$

87. List the weight age of a BCD code? Explain with an example.(Remembering) (CO1)

The weights associated with BCD code are 8421. It describes the weight of each position in a BCD number. 1001 = 1 x 8 + 0 x 4 + 0 x 2 + 1 x 1 = 9

88. Find the binary number $(1011101010111)_2$ to octal and hexadecimal systems.(Remembering) (CO1)

$(1011101010111)_2 = 001\ 011\ 101\ 010\ 111$

= 1 3 5 2 7 Octal number = $(13527)_8$

$(1011101010111)_2 = 0001\ 0111\ 0101\ 0111$

= 1 7 5 7 Hexadecimal number = $(1757)_{16}$

89. Convert the decimal number $(153)_{10}$ to binary system (Applying) (CO1)(Jan 2014)

	Quotient	Remainder
153/2	76	**1**
76/2	38	**0**
38/2	19	**0**
19/2	9	**1**
9/2	4	**1**
4/2	2	**0**
2/2	**1**	**0**

Binary number = $(10011001)_2$

90. What is the hexadecimal number $(A14D7)_{16}$ to octal system (Remembering) (CO1)

$(A14D7)_{16} = (1010\ 0001\ 0100\ 1101\ 0111)_2$

$(10100001010011010111)_2 = 010\ 100\ 001\ 010\ 011\ 010\ 111$

= 2 4 1 2 3 2 7, Octal number = $(2412327)_8$

91. Convert the decimal number $(175901)_{10}$ to hexadecimal system (Applying) (CO1)

	Quotient	Remainder
175901/16	10993	**13 (D)**
10993/16	687	**1**
687/16	42	**15 (F)**
42/16	**2**	**10 (A)**

Hexadecimal number = $(2AF1D)_{16}$

92. Deduce the hexadecimal number $(A12)_{16}$ to decimal system. (Applying) (CO1)

$(A12)_{16} = A \times 16^2 + 1 \times 16^1 + 2 \times 16^0$

= 2560 + 16 + 2

= 2578

Decimal number = $(2578)_{10}$

93. How to obtain a 1's complement of a binary number? (Remembering) (CO1)

The 1's complement of a number is obtained by changing the all ones to zeros and zero to ones.

1 0 1 1 1 0 1 1 0

↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓

0 1 0 0 0 1 0 0 1

The 1's complement of $(101110110)_2$ is $(010001001)_2$

94. How to obtain a 2's complement of a binary number?(Understanding) (CO1)

The 2's complement of a binary number is found by adding 1 to LSB of the 1's complement.

1 0 1 1 1 0 1 1 0
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
0 1 0 0 0 1 0 0 1

The 1's complement of $(101110110)_2$ is $(010001001)_2$

2's complement of binary number is $(010001001)_2 + 1 = (010001010)_2$

95. What is a BCD number?(Remembering) (CO1)

Binary Coded Decimal (BCD) is a way of representing each of the decimal digits with a binary code.

Decimal	BCD	Decimal	BCD
0	0000	5	0101
1	0001	6	0110
2	0010	7	0111
3	0011	8	1000
4	0100	9	1001

96. Define the Gray code system.(Analyzing) (CO1)

The Gray code is a non weighted and non-arithmetic code. It exhibits a single bit shift between successive coded numbers.

Binary	**Gray**
0000	0000
0001	0001
0010	0011
0011	0010
0100	0110
0101	0111
0110	0101
0111	0100

97. List the conversion steps between Gray and Binary systems with examples.(Remembering) (CO1)

Binary-to-Gray code conversion:

1. The most significant bit (left-most) in the Gray code is the same as the corresponding MSB in the binary number.
2. Going from left to right add each adjacent pair of binary code bits to get the next Gray code bit. Discard the carry values.

Gray 11011 Binary 10110

Gray-to-Binary code conversion:

1. The most significant bit (left-most) in the binary code is the same as the corresponding bit in the gray code.
2. Add each binary code bit generated to the Gray code bit in the next adjacent position. Discard the carry values.

Binary 110001 Gray 100001

98. Tell about an Excess-3 code? (Remembering) (CO1)

Excess-3 code is an non weighted code. It is generated by adding 3 to a decimal number and then converting the result into a binary number. It can also be generated by converting a decimal number to binary number and then adding 0011 to the result.

Binary	Excess-3
0000	0011
0001	0100
0010	0101
0011	0110

99. Explain binary subtraction using 1's complement.(Understanding) (CO1)

1's complement: The **ones' complement** of a binary number is defined as the value obtained by inverting all the bits in the binary representation of the number (swapping 0's for 1's and vice-versa).

```
  0001 0110     22₁₀
+ 0000 0011      3₁₀
===========   ====
  0001 1001     25₁₀
```

1's complement subtract of 19_{10} from 6_{10}.

```
  0000 0110      6₁₀
− 0001 0011     19₁₀
===========   ====
1 1111 0011   −12₁₀   — An end-around borrow is produced, and the sign bit of
                       the intermediate result is 1.
- 0000 0001     1₁₀   — Subtract the end-around borrow back into the result.
===========   ====
  1111 0010   −13₁₀   — The correct result (6 − 19 = -13)
```

100. Specify how the largest and smallest no in 2's complement can be represented.
(Understanding) (CO1)Jan 2014

```
  1111 1111                255
− 0101 1111              −  95
===========              =====
  1010 0000  (ones' complement)   160
+       1              +   1
===========              =====
  1010 0001  (two's complement)   161
```

101. Perceive an Algorithm? Sep-09(Evaluating) (CO1)

Algorithm means the logic of a program. It is a step-by-step description of how to arrive at a solution of a given problem. **(OR)**

Algorithm is defined as "any problem whose solution can be expressed in a list of executable instructions". By executing, we mean an instruction which an independent executor can actually perform, or carry out, in a step-by-step manner.

102. Identify the characteristics (or) properties of Algorithms? (Applying) (CO1)

There must be no ambiguity in any instructions, there should not be any uncertainty about which instruction is to be executed next, the algorithm should conclude after a finite number of steps. An algorithm cannot be open ended; The algorithm must be general enough to deal with my contingency.

103. How can you measure the quality of Algorithm? (Remembering) (CO1)

The primary factors that are often used to judge the quality of an algorithm are as follows,

- Time Requirement, Memory Requirement, Accuracy, Sequence, Generating

104. List out the way how algorithms may be represented? (Analyzing) (CO1)

- Normal English, Flow Chart, Pseudo code, Decision Table, Program

105. Constract a decision table? (Understanding) (CO1)

A Decision table is table containing the selection of conditions to be tested and how those conditions should be nested to arrive at proper action.

106. Define Flow Chart (Remembering) (CO1)

Flow Chart is a pictorial representation of an algorithm; it is the layout and visual representation of the plan to be followed by the corresponding algorithm.

107. Identify Input/output Symbols. (Applying) (CO1)

The parallelogram is used for both Input (Read) and output (Write), Such as that this symbol is used to denote any function of an Input/output device in the program.

108. List out the basic design structures (Analyzing) (CO1)

- Sequence structures**,** Selection structures**,** Loop structures**,** Top tested loop, Bottom tested loop

109. Criticize the advantages of Flowcharts? (Evaluating) (CO1)

- To understanding logic clearly, Better communication, Effective Analysis, Effective Synthesis, Effective coding, Proper program documentation, Systematic Debugging, Systematic Testing, Efficient program maintenance

110. List out the limitations of using Flowcharts? (Remembering) (CO1)

- Complexity, Costly, Difficult to modify, No update

111. List out the need for flowcharts symbols? (Analyzing) (CO1)

The need for flowcharts symbols because each symbols of different shapes denotes different types of instructions. The program logic through flowcharts is made easier through the use of symbols that have standardized planning.

PART B

1. With a neat block diagram explain the basic organization of a computer and list out the functions performed by each unit. (CO1)(Applying)(Jan 2014)
2. Discuss important features of various generations of computer system. Give some examples of computers for each generation. (Sep 2009,Feb 2009)(CO1)(Creating)
3. Explain the classification of computers in detail. (CO1)(Understanding)(Jan 2013)
4. Describe the evolution of computers. (CO1)(Creating)
5. Explain with examples the conversion of numbers from one number system to others. (Jan 2011,2012,2013)(CO1)(Understanding)
6. List the characteristics of computer and explain it. (CO1)(Remembering)(Jan 2013,2014)
7. Explain the application of computer. **(**CO1)(Analyzing) (Jan 2013,2014)
8. Illustrate the process of addition and subtraction in 1's and 2's complement system with suitable examples. (Jan 2012) (CO1)(Understanding)
9. Give the different generation of languages in the evaluation of computer-software. (June 2012)(CO1)(Applying)
10. What is volatile memory? Explain different types of volatile memory. June 2012(CO1)(Analyzing)
11. Differentiate between ASCII '7' and ASCII '8'. (Understanding) (CO1) (Jan 2013) (4 Mark)
12. Why binary number system used in digital computers. (Remembering CO1)(Jan 2013) (4 Mark)
13. Theme of algorithm & Explain with an example. June 2012, Jan 2013, Jan 2014(CO1)(Analyzing)
14. Draw the parts of flow chart with an example? Give its advantages and limitations. June 14, 2012,Jan2013(CO1)(Applying)
15. Define pseudo code with an example. June 2012, Jan 2014(CO1)(Remembering)

UNIT II: C PROGRAMMING BASICS

PART – A

1. Who developed the 'C' language?(Remembering)

'C' is one of the most popular programming languages; it was developed by the ***Dennis Ritchie*** at AT & T's Bell Laboratories at USA in 1972.

2. Explain the features of 'C' language.(Understanding)

i) 'C' is a general purpose, structured programming language.

ii) 'C' is powerful, efficient, compact and flexible.

ii.) 'C' is highly portable.

iv) 'C' is a robust language whose rich set of built in functions and operators can be used to write any complex program.

3. What is meant by global declaration section? (Remembering)

The variables that are used in more than one function throughout the program called global variables and declared outside of all the function. i.e., before main ().

4. Define comment. (Remembering)

Comments are very helpful in identifying the program features and underlying logic of the program. The lines begins with '/*' and ending with '*/' are known as comment lines. There are not executable, the compiler is ignored anything in between.

5. List out the characteristics of a program. (Remembering)

a) Clarity b) Integrity c) Simplicity d) Efficiency e) Generality.

6. Analyze the programming rules should follow while writing a 'C' program?(Analyzing)

The following rules should follow while writing a 'C' program.

1. All statements in 'C' program should be written in lower case letters. Upper case letters are only used for symbolic constants.
2. Blank spaces may be inserted between the words. It is not used while declaring a Variable, keyword, constant and function.
3.The program statement can written anywhere between the two braces following the declaration part.
4.The user can also write one or more statements in one line separating them with a semicolon (;).

7. Construct logical and data errors.(Creating)

Logical Errors: These are the errors, in which the conditional and control statements cannot and their match after some sequential execution.

Data Errors: These are the errors, in which the input data given is not in a proper syntax as specified in input statements.

8. Explain 'C' character set? (Understanding)

The character set is the fundamental raw material of any language and they are used to represent information. Like natural languages, computer language will also have well defined character set, which is useful to build the programs.

9. Explain identifier.(Evaluating)

Identifiers are names given top various program elements, such as variables, functions and array etc.

10. Define identifier. List the rules for declaring an identifier.(Remembering, Analyzing)

Identifiers are the names defined by the programmer for various program elements a such as variable, constant and functions. Identifier consists of sequence of letters and digits.

Rules for declare an identifier:

- First character must be a letter. Followed by letter or digit.
- Special character not allowed except underscore.
- Length of the identifier is significant up to certain digits depends on the compiler.

11. What do you mean by 'C' tokens? Jan 2014 (Remembering)

The tokens are usually referred as individual text and punctuation in a passage of text. The 'C' language program can contain the individual units called the 'C' tokens.

12. List the different data types available in 'C'? (Analyzing)

There are four basic data types available in 'C'

i) *int* ii) *Float* iii) *Char* iv)*Double*

13. Explain data types.(Evaluating)

Data type is the type of the data that are going to access within the program. 'C' supports different data types; each data types may have predefined memory requirement and storage representation.

14. Build the user-defined data types available in 'C'? (Applying)

User defined data types: C supports the following user defined data types.

- Structures, Unions, Enumerated data type, Type definition

15. What are Keywords? (Remembering)

Keywords are certain reserved words that have standard and pre-defined meaning in 'C'. These keywords can be used only for their intended purpose.

16. Explain variables? Jan 2013 (Understanding)

A variable is an identifier that is used to represent some specified type of information within a designated portion of the program. And also value of variable changes during the execution of a program.

17. Functions of local variable? (Jan 2013, 2014)(Analyzing)

The variables which are defined inside a function block or inside compound statements of a function sub-program are called local variable.

18. Define constants. (Remembering)

The items whose values cannot be changed during the execution of program are called constants.

19.Name the types of numeric constants? (Understanding)

Integer Constants:

An integer constant formed with the sequence of digits. There are three types of integer constants which forms different number system.

Real constants:

A real constant is made up of sequence of numeric digits with presence of a decimal point. Real constants serve as a good purpose to represent quantities that vary continuously such as distance, heights, temperatures etc…

20. Define constants. (Remembering)

A string constant is a sequence of characters enclosed in double quotes, the characters may be letters, numbers, special characters and blank spaces etc. At the end of string '/0' is automatically placed.

21. Define statements. (Understanding)

It can be defines as set of declaration, or sequence of action. Statement causes the computer to perform some action.

22. Discuss operator and operand? (Creating)

An operator is a symbol that specifies an operation to be performed on operands.

Ex. +, -, *, / are called arithmetic operators. The data items that operators act upon are called operands. Ex. a+b, in this statement a and b are called operands.

23. What is mean by assignment operators? (Remembering)

Assignment operators are used to assign the result of an expression to a variable. The equal (=) sign is used as an assignment operator. The general format is *Identifier=expression*;

24. Estimate the compound assignment operators. (Creating)

C has a set of short hand assignment operator of the form.

Identifier<arithmetic operator>=expression;

The table below shows the commonly used shorthand assignment operators. It is called component assignment operators.

Simple assignment operators	Shorthand assignment operator
X=x+L	x+=l
Y=y-1	Y-=1
Z=z*(x+y)	Z*=(x+y)
Y=y/(x+y)	y/=(x+y)
X=x%z	X%=z

25. Name the Bitwise operators available in 'C'? (Remembering)

& Bitwise AND | Bitwise OR 1's Complement

>> Right Shift << Left Shift ^ Bitwise XOR are called bit field operators

Ex. k= ~j, where ~ operator take 1's complement of **j** and the result is stored in **k.**

26. Construct the Logical operators available in 'C'? (Applying)

The logical operators in 'C' are

&& Logical AND || Logical OR ! Logical NOT

27. Classify the difference between Logical AND and Bitwise AND? (Understanding)

Logical AND (&&): Only used in connection with two expressions, to test more then one condition, If both the conditions are true then returns 1, If false then return 0,

Bitwise AND (&): Only used in bitwise manipulation, it is Unary operator.

28. Compare "=" and "= =" operator?(Evaluating)

Where = is an assignment operator and = = is a relational operator. **Example:** while (i=5) is an infinite loop because it is non- zero value and while (i= =5) is true only when i=5.

29. Define expression.(Remembering)

An expression represents data item such as variables, constants and are interconnected with operators as per the syntax of the language. An expression is evaluated using operator.

30. List the types of I/O statements available in 'C'?(Analyzing)

i) Formatted I/O statements ii) Unformatted I/O statements.

31. Define single character input getchar () function. (Remembering)

The *getchar ()* function is written in standard I/O library. It reads a single character from a standard input device. These functions do not require any arguments, through a pair of empty parentheses, must follow the statement getchar ().

32. Classify the single character output putchar () function. (Understanding)

The putchar () function is used to display one character at a time on the standard output device. This function does the reverse operation of the single character input function.

33. Define scanf () statement. (Remembering)

The scanf () function is used to read information from the standard input device (keyboard), scanf () function starts with a string argument and may contain additional arguments.

34. Define printf () statement. (Remembering)

Output data or result of an operation can be displayed from the computer to a standard output device using the library function printf (). This function is used to output any combination of data.

35. Explain conversion specification? (Understanding)

The conversion specifications are used to accept or display the data using the INPUT/OUTPUT statements.

36. List the difference between scanf() and gets() function?(Analyzing)

In scanf () when there is a blank was typed, the scanf () assumes that it is an end.

gets() assumes the enter key as end. That is gets () gets a newline (\n) terminated string of character from the keyboard and replaces '\n'.

37. Explain for loop. (Understanding)

The *for* loop is another repetitive control structure, and its used to execute set of instructions repeatedly until the condition becomes false.

38. What are the differences between *while* and *do while* loop(Analyzing)

S.No	***While***	***do…while***
1.	It is a top tested loop	It is bottom tested loop
2.	The condition is first tested, if the condition is true then the block executed until the condition becomes false.	It executes the body once, after it checks the condition, if it is true the body is executed until the condition becomes false.
3.	Loop will not be executed, if the condition is false.	Loop is executed at least once even though the condition is false.
4.	It is Entry control statement.	It is Exit control statement.

39. What is meant by break statement? (Remembering)

The break statement is used to terminate the loop. When the keyword *break* is used inside any 'C' loop, control automatically transferred to the first statement after the loop. A *break* is usually associated with an *if* statement.

40. Explain continue statement? (Understanding)

In some situations, we want to take the control to the beginning of the loop, bypassing the statements inside the loop which have not yet been executed, for this purpose the *continue* is used.

41. Define goto statement. Jan 2013 (Remembering)

The goto statement transfers the control unconditionally from one place to another place in the program.

PART B

1. Explain about looping statement with Example? Jan 2012, Jan 2013 (Understanding)
2. Explain about Branching statement? With example? Jan 2012, Jan 2014 (Evaluating)
3. Explain the following with example. Constants, Variables, Data types, Operators and expression. June 2012, Jan 2013, Jan 2014 (Understanding)
4. Analyze the concept of C-overview?(Analyzing)

5. Explain input and output function in C. Jan 2012 (Evaluating)
6. Write a C program to count number of 0's, 1's and blank spaces and other character. Jan 2011 2 (Understanding)
7. Write a C program to read and write employee and their date of joining using nested structure. Jan 2011 (Understanding)
8. Write a C program to determine whether given number is odd or not using if-else statement. Jan 20112 (Understanding)
9. Write C program to print the prime numbers less than 500. Jan 2012 2 (Understanding)
10. Write a 'C' program to check the following series. e=[1+(1/1!)+(1/2!)+….+(1/n!)] Jan 2012 (Understanding)
11. Write a C program to accept any 3 numbers and find their square and cubes. Jan 2014 (Understanding)

UNIT – III ARRAYS AND STRINGS

PART – A

1. Define Array. Jan 2014 (Remembering)

An array is a collection of similar data items, that are stored under a common name a value in an array is identified by index or subscript enclosed in square brackets with array name.

2. List the classification of array. Jan 2014 (Analyzing)

Arrays can be classified into one-dimensional array, two-dimensional array, Multi dimensional array.

3. Create one dimensional array.(Creating)

The collection of data items can be stored a one variable name using only one subscript; such a variable is called the one dimensional array.

4. List the features of arrays(Analyzing)

An array is a derived data type. It is used to represent a collection of elements of the same data type. The elements can be accessed with base address and subscripts define the position of the element.

In array the elements are stored in continuous memory location the starting memory locations represented by the array name and it is known as the base address of the array, It is easier to refer the array elements by simply incrementing the value of the subscript.

5. Define processing an array (Remembering)

The entire array cannot be accessed with single operation, so the array elements must be accessed on an element by element basic. This can be usually done with the help of the loop, when each pass of the loop is used to access an array element, thus the number op passes through the loop will therefore equal the number of array elements to be processed.

6.List the ways to follow to initialize array? (Analyzing)

The values can be initialized to an array, when they are declared like ordinary variables, otherwise they hold garbage values.

7. What is meant by two dimensional arrays? (Remembering)

Two dimensional arrays are used in situation where a table of values needs to be stored in an array; These can be defined in the same fashions in one dimensional array, except separate pair of square brackets is required for each subscript.

8. Create the arrays to functions.(Creating)

An entire array can be transferred to a function as a parameter to transfer an array to a function; the array name is enough without subscripts as actual parameters within the function call.

9. What is meant by arrays of characters? (Remembering)

A String is a collection of characters. A string constant is a one dimensional array of characters terminated by null character.

10. What is a recursion? Jan 2014 (Remembering)

Recursion is the process of calling the same function itself again and again until some condition is satisfied. This process is used for repetitive computation in which each action is satisfied in terms of a previous result.

11. Explain enumerated data type? (Understanding)

Enumerated data types are used to create user-defined data types which are not defined in the C data type list. Enum is the keyword used to create any data type and to define the values that the data type can hold.

12. What is meant by an array of structure? (Remembering)

In order to handle more records within one structure, array of structure can be used to store them in one structure variable.

```
struct book
  {
   char name[10];      int price;      int pages;
  } b[3];
```

13. Is it possible to refer the elements of an array by using pointer notation? If so give an example. (Analyzing)(Jan 2013).

double *p; double balance[10]; p = balance;

It is legal to use array names as constant pointers, and vice versa. Therefore, *(balance + 4) is a legitimate way of accessing the data at balance. Once you store the address of first element in p, you can access array elements using *p, *(p+1), *(p+2) and so on

14. What is EOF. Why is that required. (Remembering)Jan 2013

EOF-End Of File. It is used when parsing a file. The computer should know when it has reached the end of file. If we don't use EOF, we get an error.

15. What is meant by string manipulation? (Remembering)

In 'C' language the group of character, digits and symbols enclosed within quotation marks are called as string otherwise strings are array of characters, Null character is used to mark the end of string.

16. Define strcpy () function. (Remembering)

This function is used to copy the contents of one string to another and it almost works like string assignment operator.

17. Explain Multi dimensional array(Understanding)

Like one and two dimensional arrays. 'C' language allows multidimensional array, the dimension with three or more called multi dimensional arrays.

18. What is meant by strrev () function? (Remembering)

The strrev () function is used to reverse a string. These functions take only one argument and return one argument.

PART - B

1. Explain about the following 1).Preprocessor 2).Arrays Jan 2014 (Understanding)
2. Explain ten string handling functions with an example. Explain three built-in function. Jan 2013 (Understanding)
3. State the rule that determines the order in which initial values are assigned to multi-dimensional array elements. Give sample program for illustration. Jan 2013 (Analyzing)
4. Write a C program to perform matrix addition. Jan 2011, Jan 2014 (Understanding)
5. Write a C program to perform matrix multiplication. (Understanding)
6. Write a C program to sort a given numbers. (Understanding)
7. Write a C program to perform searching a number from a group of numbers. (Understanding)
8. Write a program to reverse a given string. (Understanding)

UNIT IV FUNCTIONS AND POINTERS

PART – A

1. Explain function(Evaluating)

A function is a set of instructions that are used to perform specified tasks which repeatedly occurs in the main program.

2. What is meant by user defined function? (Remembering)

The function defined by the users according to their requirements is called user defined functions.

3. List the advantages of user defined functions(Analyzing)

a) The length of the source program can be reduced by dividing it into the smaller functions

b) By using functions it is very easy to locate and debug an error.

c) The user-defined function can be used in many locate and debug an error.

d) Functions avoid coding of repeated programming of the similar instructions.

4. How Functions works? (Remembering)

Whenever function is called control passes to the called function and working of the calling function temporarily stopped. When the execution of the called function is completed then a control returns back to the calling function and executes the next statement.

5. List the points to be followed while declaring functions? (Analyzing)

- The list of parameters must be separated by comma
- The names of the parameters are optional but data types are must.
- If the function does not return any value, then the return type void is must.
- The data type of actual and formal parameters must match.

6. List the three elements of user-defined functions? (Analyzing)

Function definition: It is the process of specifying and establishing the user defined function by specifying all of its elements and characteristics.

Function declaration: Like the normal variables in a program, the function can also be declared before they defined and invoked.

Function call: The function can be called by simply specifying the name of the function, return values and parameters if presence.

7. What is meant by actual and formal parameters? (Remembering)

Actual Parameters: These are parameters transferred from the calling program (main program) to the called program (function).

Formal parameters: These are the parameters, transferred in to the calling function (main) from the called program (function).

8. Compare Local and global variable. (Analyzing)

The Local variables are defined within the body of the function or the blocking. These variables are defined is local to that function or block only, other function cannot access these variables. Global variables are defined outside the main () function, multiple function can use these variables.

9. What is a return statement? (Remembering)

The return statement may or may not send back any values to the main program (calling program).if it does, it can be done using the return statement.

10. List the three points while using the return statement. (Analyzing)

The return statement can return only one value from the called function to the calling function. The return statement can be present anywhere in the function.The return statement not necessary at the end of the statement.

If the called function does not return any value, then the keyword void must be used as the return type specifies.

11. Define Prototypes(Remembering)

In ‘c’ while defining user-defined function it is a must to declare its prototype. Prototype statements keep the compiler to check the return type and arguments types of the function.

12. List out the four functions of prototypes(Analyzing)

Function with no arguments and no value, Function with arguments and no return value. Function with arguments and with return values, Function with no arguments and with return values.

13. Define Function with arguments and more than value prototypes. (Remembering)

In this prototype, data is transferred from calling function to called function. i.e.., the called program receives some data from the calling program and does not send back any values to calling program. (One way communication).such functions are partly dependent on the calling function.

14. Define call by value(Remembering)

This method copies the values of actual parameters into the formal parameters of the functions are partly dependent on the calling function.

15. Define Call by reference(Remembering)

Call by reference is another way of passing parameters to the function. Here, the address of arguments are copied into the parameters inside the function, the address is used to access the actual arguments used in the call. Hence changes made in the arguments are permanent.

16. Explain nesting of function(Understanding)

'C' Language provides a facility to write one function within another function. This Process is called nesting of function.

17. List the Functions as an argument(Analyzing)

We have passed the values or the address of arguments through the functions. But it is also possible to pass the entire function as an argument to another function.

18. What is a function with operators? (Remembering)

The function uses various operators, such as assignment, addition, subtraction, multiplication, division, increment, and decrement operators.

19. What is meant by recursion? (Remembering)

Recursion is the process of calling the same function itself again and again until some condition it satisfied. This process is used for repetitive computation in which each action is satisfied in terms of a previous result.

20. Construct the data type and storage classes?(Applying)

Data Type: It refers to the type of information represented by a variable.

E.g.: integer number, floating point number, character, etc,

Storage class: It refers to the scope of the variable within the program.

21. Functions of external variable? (Applying)

The external variables are declared out of the main () function. The availability of these variables are throughout the program and that is both in main program and inside the user defined functions.

22. Define register variable(Remembering)

Registers are special storage areas within a computer's Central Processing Unit. The actual arithmetic and logical operation that comprise a program are carried out within these registers.

23. What is mean by Library function? (Remembering)

C language provides built-in functions or infrasonic functions called library functions. The compiler itself evaluates these functions.

24. Define pointer. (Remembering)

A pointer is a memory variable that stores a memory address. It can have any name that is legal for another variable and it is declared in the same fashion like other variables but it is always denoted by '*' operator.

25. **List the features of pointer**? (Analyzing)

Save memory space, faster execution, efficient memory management (dynamic memory allocation), used with data structure, for representing two dimensional and multi dimensional array.

26. Write the syntax for pointer to structure.(Remembering)

Ex; struct book {char name [25]; char author [25]; int pages;};

27. What is the use of indirection operator? (Analyzing)

It indicates that the value stored in the pointer at that memory location is to be accessed.

28. What is array of pointers? (Remembering)

Array of pointer is defined as collection of addresses.

29. Explain pointer to pointer. Jan 2014 (Evaluating)

The pointer variable containing the address of another pointer variable

30. Define void pointers? (Remembering)

Void pointers cannot be dereferenced without explicit type conversion. This is because, being void the compiler cannot determine the size of the object that the pointer points to.

PART – B

1. Explain the concept of user defined function with an example program. Jan 2013 (Remembering)
2. Explain the recursive function with an example. (Remembering)

3. Analyze the Perform sorting, with call by value & call by reference technique? (Analyzing)
4. Discuss about pointer and array of pointers with an example. Jan 2013 (Remembering)
5. Define arithmetic pointer with an example. (Remembering)
6. Discuss the pointer to pointer? Jan 2013 (Creating)
7. Write a C program to print the students using pointers. Jan 2014 (Remembering)

UNIT V STRUCTURES AND UNIONS

PART – A

1. Define Structure? (Understanding)

A structure contains one or more data items of different data type in which the individual elements can differ in type. A simple structure may contain the integer elements, float elements and character elements etc. the individual; structure elements are called members.

2. Define structure Declaration? (Remembering)

The structure can be declared with the keyword strut following the name and opening brace with data elements of different type then closing brace with semicolon.

3. List a rule while declaring a structure.(Analyzing)

- A structure must end with a semicolon.
- Usually a structure appears at the top of the source program.
- Each structure element must be terminated. The structure variable must be accesses with structure variable with dot(.) operator.

4. What is a user defined data type? (Remembering)

C provides a capability that enables the programmer to assign an alternate name to a data type. This is done with a statement know as typedef.

5. Differentiate between array and structure. (Analyzing)

Arrays	Structure
An array is a collection of similar data items.	A structure is a collection of dissimilar data items
An array is derived data type	It is a user defined data type.
It behaves like a built in data types	It must be declared and defined
An array can be increased or decreased	Structure element can be added

6. List the rules for initializing structure. (Analyzing)

The individual data members of structure cannot be initialized.

The structure variables can be initialized at compile time only.

The order of data members in a structure must match the order of values in enclosed brackets. We can initialize only some of the data members of the structure.

The uninitialized data members can be initialized by default with zero for int and float '\0' for character and strings.

7. Define union. (Remembering)

Union is a derived data types and is declared like structure. The difference between union and structure is in terms of storage. In structure each member has its own storage location, where as all the members of union use the same location. Even a union may contain many members of different types.

8. List any three comparison structure and union. Jan 2013, Jan 2014 (Analyzing)

Structure: Every member has its own memory space, Keyword struct is used, and any member can be accessed at any time without the loss of data.

Union: All the members use the same memory space the values, Keyword union is used. Different interpretation for the same memory location is possible.

9. Define nested structure? (Remembering)

If a structure contains more than one structure as its members, is known as a nested structure. I.e. structure with in another structure. It is used to increase the readability of the program by reducing the complexity.

10. List a three ways to pass structure variables. (Analyzing)

- Pass each member of the structure as an actual argument of the function call.
- Pass a copy of the entire structure to the called function.
- Through pointer pass the structure as an argument.

11. What is a self referential structure? (Remembering)

A structure consists of at least a pointer member pointing to the same structure is known as a self referential structure.

12. List the storage classes available in 'C?(Analyzing)

Auto, External, Static and Register.

13. Estimate the 'auto' storage class? Jan 2013 (Evaluating)

The variables without any storage class specification are considered as automatic variables and the memory space is allocated as and when the variable is declared. These variables are declared within a function. These variables have temporary memory allocation and after execution the memory will be disposed.

14. Explain 'Static' variable? (Understanding)

The content of the static variables are retained throughout the program. These variables are initialized only once. They are permanent within the function in which they are declared.

15. What is 'External' variable? (Remembering)

The variables that are available to all the functions are global (or) external variable. The complier does not allocate memory for these variables. It is already allocated for it in another module where it is declared as a global variable.

16. What is 'Register' variable? (Remembering)

A register variable is a variable that can be used as CPU register. The main advantage of using a register variable is that the registers can be easily accessed compared to memory. There is a limit in the number of CPU registers available in a system. Once the limit has been reached, the compiler automatically converts register variables to non-register variables.

17. What is meant by Type Cast? (Remembering)

'Type Cast' operator is used to convert the type of an expression from one form to another by placing the desired type inside the parentheses before an expression.

Ex: b= (int) 20.8/(int) 5.3, evaluates as 20/5.

18. What is meant by files? (Remembering)

A file is a collection of related information that is permanently stored on the disk and allows us to access and alter the information whenever necessary.

19. Define bits and bytes? (Remembering)

Bits: Bits are known as binary digits, bits are the smallest value in a data file. Each bit value can only be a 0 or 1.

Bytes: It is provide the next step in the data file. Bytes are most commonly made up of eight bits and used to store a single character, such as a number, a letter or any other character found in a character set.

20. List the types of files? (Analyzing)

Sequential file, Indexed sequential file, Random access file.

21. Difference between printf (), sprintf (), fprintf ()?(Analyzing)

printf () issued to print the text or value of the variables in the screen.

sprintf () is used to store the values in the character array or string.

fprintf () is used to store the values of variable in the file.

22. What is stream? (Remembering)

Stream means reading and writing of data. A stream is a file or a physical device like keyboard, printer, and monitor.

23. List steps for file operations (Analyzing)

- opening a file
- Reading or writing a file
- Closing a file

24. List some file functions (Analyzing)

- fopen()
- fclose()
- fgetc()
- fprintf()
- ftell()
- rewind()
- unlink()
- rename()

25. What are preprocessor directives? (Remembering)

Preprocessor directives, such as #define and #include, are typically used to make source programs easy to change and easy to compile in different execution environments. Directives in the source file tell the preprocessor to perform specific actions.

PART – B

1. Explain the role of C processor and describe file inclusive directive. Jan 2011 (Understanding)
2. Explain the steps for file operation in detail. Jan 2014, Jan 2013 (Understanding)
3. What are command line arrangement and how are they accessed.Jan2013(Understanding)
4. What are the difference between a binary file and text file in C. How are they differentiated.Jan2013(Understanding)
5. Explain in detail about storage classes in C programming? (Understanding)
6. Write detail about Structure concept in C? (Remembering)
7. Explain in detail about Union in C? (Understanding)