

Answer any 5(1 Score Each)

1. (b) 769 2. (a)Registers 3. (c) cin 4. (c) Ternary operator 5. $z=pow(x,y)$; 6. Subscriber Identity Module

Answer any 9 from 7-18. (2 Score Each)

- 7. $a \rightarrow 2, b \rightarrow 4, c \rightarrow 3, d \rightarrow 1$
- 8. $A2D \rightarrow 1010\ 0010\ 1101_2 \rightarrow (5055)_8$
- 9. Green design, Green manufacturing, Green use, Green disposal($\frac{1}{2} \times 4=2$ Score)
- 10. Ongoing process beginning from problem study phase to implementation and operation. writing comments in source code-internal documentation. It helps in debugging and program modification. Not considered for translation by language processor. Preparation of system manual and user manual – External documentation (4 points x $\frac{1}{2}$ Score Each)
- 11. float \rightarrow keyword, x \rightarrow identifier, = \rightarrow operator, 3.14 \rightarrow literal, ; \rightarrow punctuator (Any 4 : $\frac{1}{2} \times 4 = 2$ Score)
- 12 To alter size, range or precision of datatypes (1score) Signed, Unsigned, Long, Short Any 2(1 Score)
- 13. // for single line comment and /*... */ for multiline commenting (1+1=2 Score)
- 14.

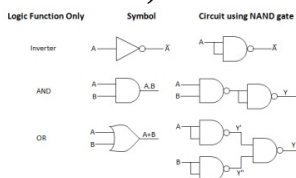
```
if(test expression){ statement block1;}
else { statementblock2;} (2 Score)
```
- 15.Linear Search: The elements need not be in any order. Takes more time for the process. May need to visit all the elements. Suitable when the array is small. (1 Score)
- Binary Search: The elements need to be in any order. Takes very less time for the process. All the elements are never visited. Suitable when the array is large. (1 Score)
- 16. a) strlen() b) strcat(); c) abs(); d) toupper(); ($\frac{1}{2} \times 4 = 2$ Score)
- 17. High speed connection(above 256kbps), Connection is always on. Simultaneous use of voice and internet possible. (any 2.) (1+1=2Score)

18. standalone malicious software program that replicate itself in order to spread to other computers by its own. A worm does not need to attach itself to a program to propagate. It takes advantage of the data transport features of the computer system to travel without help. (1+1=2Score)

Answer any 9 from 19-30(3 Scores Each)

19. Analytical engine had a store(memory) where numbers and intermediate results could be stored. It also had a separate mill(processor) where arithmetic processing could be performed. Its input output devices were in the form of punched cards containing instructions. All these are still used in one way or other in modern computers.(1+1+1=3 Score)

20.Proper Logic circuits (1+1+1=3 Score)



21. $(a+b)'=a'+b'$ or The compliment of sum of Boolean variables is equal to the product of their individual complements

We have to prove that $(a+b)'=a'+b'$

Let us assume that, $z=x+y \rightarrow (1)$. Then $z'=(x+y)' \rightarrow (2)$

We know that by complementary law, the equations three and four are true.

$z + z' = 1 \rightarrow (3)$ $z.z' = 0 \rightarrow (4)$

substituting expressions (1) in (3) and (2) in (4), we will get equations (5) and (6)

$(x + y) + (x + y)' = 1 \rightarrow (5)$ $(x + y).(x + y)' = 0 \rightarrow (6)$

For the time being let us assume that De-morgan's first theorem is true.if $(x + y)'$ in equations (5) and (6) can be substituted with $x'.y'$. Thus equations 5 and 6 can be modified as follows

$(x + y) + (x'.y') = 1 \rightarrow (7)$

$(x + y).(x'.y') = 0 \rightarrow (8)$

Now we will prove equations 7 and 8 separately. If they are correct, we can conclude that the assumptions we made to form those equations are also correct that is if equations 7 and 8 are true, De morgan's theorem is also true. Consider the LHS of equation 7,

$(x+y)+(x'.y')=(x+y+x').(x+y+y')$ Distributive Law

$(x+x'.y).(x+y+y')$ (Associative Law)

$(1+y).(x+1)$ (Complimentary Law)

$=1.1$

$=1$

$=RHS$

Now let us consider the LHS of equation(8),

$(x+y).(x'.y')=(x.x'.y')+(y.x'.y')$ Distributive Law

$(x.x'.y')+(y.y'.x')$ (Associative Law)

$(0.y')+(0.x')$ (Complimentary Law)

$=0+0$

$=0$

$=RHS$

we have algebraically proved equations 7 and 8, which mean that De-morgan's first theorem is proved.

(1+1+1=3 Score)

22.

connector

Symbol	Name	Function
	Start/End	An oval represents a start or end point
	Arrows	A line is a connector that shows relationships between the representative shapes
	Input/Output	A parallelogram represents input or output
	Process	A rectangle represents a process
	Decision	A diamond indicates a decision

($\frac{1}{2} \times 6=3$ Score)

23. Unlike implicit type conversion, sometimes the programmer may decide the data type of the result of evaluation. This is done by the programmer by specifying the data type within parenthesis to the left of the operand. Since the programmer explicitly casts a data to the desired type, it is known as explicit type conversion or type casting. Usually typecasting is applied on the variable in the expressions. Ex: $int\ x=5,y=2;$ $float\ result=(float)x/y;$ (1+1+1=3 Score)

24. Identifiers are the user defined words that are used to name different program elements such as memory locations, statements, functions, objects, classes etc. The identifier assigned to statements are called labels. The identifiers of memory locations are called variables. Identifiers used to refer a set of statements are called function names.

The rules for constructing identifiers are as follows:

- \rightarrow Arbitrary long sequence of letters digits and underscores
- \rightarrow The first character must be a letter for underscore
- \rightarrow White space and special characters are not allowed

→ Keywords cannot be used as identifiers
 → Upper and lowercase letters are treated differently.
 (1+ ½ x4 =3 Score)
 25. Sorting, searching, merging, traversal, insertion and deletion (½ x 6=3 Score)
 26. Abdul. It's because c++ cin statement can't read white spaces. Blank space is a whitespace character used to separate data. So, Abdul and Kalam are treated as separate data. gets(name); (1+1+1=3Scores)
 27. Call by value method and Call by reference method. Call by value method: Ordinary variables are used as formal parameters. Actual parameters may be constants variables or expressions. The changes made in the formal arguments are not reflected in actual arguments. Exclusive memory allocation is required for the formal arguments.
 Call by reference method: Reference variables are used as formal parameters. Actual parameters will be variable only. The changes made in the formal arguments are reflected in actual arguments. Memory of actual arguments is shared by formal arguments
 (1+ ½ x4 =3 Score)

28. The process of calling a function by itself is known as recursion and the function is known as recursive function

```
long int fact(int n)
{
if (n>=1)      return n*fact(n-1);
else          return 1;
}
```

```
long int fact(int n)
{
for(fact=i=1; i<=n; i++)
{fact=fact*i;
}
return f;
}(1+1+1=3Score)
```

29. The various wireless communication technologies using radio waves are Bluetooth, Wi-Fi, wimax and satellite link.

Bluetooth: radio waves in the frequency range of 2.402GHz to 2.480GHz. Used for short range communication approximately 10mtrs. Used in cell phones, laptops, mouse, keyboard, tablets, headsets, camera. Uses no line of sight between communicating devices. Can connect upto 8 devices simultaneously. Slow data transfer rate up to 1 megabits per second.

Wi-Fi
 to transfer information across a network like cell phones, televisions and radios. The radio waves used in Wi-Fi ranges from a frequency of 2.4 gigahertz to 5Gigahertz. Communication across a wireless network is two way radio communication. The wireless adaptor in a computer translates data into radio signals and transmits it using an antenna. Once decoded, the data will be sent to the internet or network through a wired Ethernet/ wireless communication. Line of sight between communication device is not required. Data transmission

speeds up to 54 Mbps. Wi-Fi can connect more number of devices simultaneously. Used for communication upto 375 feet

Wimax: Worldwide interoperability for microwave access. Hundreds of users can connect to a single station. Provides highest speed connection upto 70 Mbps over an area of 45 kilometres. Line of sight between communicating devices is not required. Weather conditions like rain, storm etc could interrupt the signal. Very high power consumption. High cost of installation and operation.

Satellite Link
 Long distance wireless communication systems used satellite link for transmitting signals. satellites cover a large area of the Earth. This system is expensive. Requires legal permission and authorisation. Uplinking frequency ranges from 1.6 gigahertz to 30Gigahertz and downlink frequency is between 1.5 GigaHz to 25GHz. Downlink frequency is always lower than the uplink frequency.(1+1+1=3Score)

30. Brings people together. Plan and organise events, Business promotion, Social skills like expressing views and becoming an agent of change. (3 Score)

Answer any 2 from 31,32,33 (5 Scores Each)

31. general purpose software are used to perform tasks in a particular application area. Such software is developed keeping in mind, the various requirements of users. They provide a vast number of features for its users. General purpose software is classified as word processors, spreadsheet software, presentation software, database software and multimedia software.

word processing software is designed for creating and modifying documents. It helps to edit, format and print textual matters easily. Different font settings, paragraph settings, bullets and numbering elements and more features are available in this type of software. It can check spelling and grammar in the document. Insertion of pictures, charts and tables are possible. We can also specify headers and footers. Ex: MS Word, open office writer, Apple iwork pages.

Spreadsheet software allows users to perform calculations using spreadsheets. This simulate paper worksheets by displaying multiple cells that make up a grid. It allows to insert, drawing objects in the worksheet and create different types of charts for graphical representation of numerical data. examples are Microsoft Excel, OpenOffice calc, Lotus 1-2-3, Apple iwork

Presentation software is used to display information in the form of a slideshow and it allows preparing slides containing pictures, text, animation, video and sound effects. Microsoft PowerPoint Apple iwork keynote and OpenOffice impress are examples

database is an organised collection of data arranged in tabular form. DBMS consists of a collection of interrelated data and set of programs to access those data. It helps in easy retrieval and storage of data.

privacy and security are also provided by DBMS and it also enforces standards for data. Eg: Microsoft access, Oracle, postgres SQL, my SQL etc.

multimedia is the integration of multiple forms of media. This include text, graphics, audio, video etc. Multimedia softwares can process information in a number of media formats. It is capable of playing media files. Some multimedia softwares are used to create and edit audio and video files. Audio converters, audio players and video editing softwares are some forms of multimedia softwares. Examples are VLC player, Adobe flash, real player, media player etc.(5 Score)

32.While writing programs we use some specific constructs of the language to perform the repeated execution of a set of one or more statements. Such constructs are called iteration statements or looping statements. In C++ we have three iteration statements and all of them allow a set of instruction to be executed repeatedly when the condition is true.

Initially total score has no value
repeat the following steps starting from the first student till the last

```
{  
Add score of the student to the total score  
take the score of next student  
}
```

average=total score/number of students in the class.

In this type of problems we use counter to know how many times the process is executed. The value of this counter decides whether to continue or to terminate execution .since loops work on the basis of such conditions, a variable like the counter will be used to construct a loop. This variable is generally known as loop control variable because it actually controls the execution of the loop. The four elements of a loop are initialisation, Test expression, update statement and body of the loop.

Initialisation is setting the initial value to the control variable before entering the loop

Test expression is relational and logical expression whose value is either true or false. It decides whether the loop body will be executed or not. If the test expression evaluates to true the loop body gets executed otherwise it will not be executed.

Update statement is the statement which modifies the loop control variable by changing its value. The update statement is executed before the next iteration.

Body of the loop contains the statements that need to be executed repeatedly. It may be a simple statement or a compound statement.(1x5 =5Score)

33. The main advantages of using network computers instead of standalone computers is listed below.

Resource sharing: sharing of available hardware and software resources in a computer network is called resource sharing. we can share the DVD, printers, hard disk, scanners etc. Software can also be shared through computer networks.

price performance ratio: One can easily share the resources available in one computer with other computer. The cost of purchasing licensed software for each computer can be reduced by purchasing network

versions of such software. This will least affect the performance of such resources and lead to considerable savings in cost.

Communication: Computer network helps users to communicate with any other user of the network through its services like email, chatting, video conferencing etc. One can send or receive messages within no time irrespective of the distance.

Reliability: It is possible to replicate or backup data or information in multiple computers using the network. The C++ files, photos or songs saved in one computer can also be saved in another computer on the same network. This can be retrieved from other computers in which they are saved in case of disasters.

Scalability: computing capacity can be increased or decreased by adding for removing computers to the network .In addition to this, the storage capacity of networks can also be increased by including more storage devices to the network.(1x5=5Score)

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