

PeP EE 1

**Read instructions on this page carefully.
Do not turn this page until you are asked to do so.**

Test Paper ID: 32
Duration: 60 Minutes
Number of questions: 40

Instructions:

1. Do not write anything on this test paper.
2. Separate sheets will be provided for rough work. Please ask if you need more.
3. Fill all the details clearly in the answer sheet.
4. Mark answers in the answer sheet provided by filling the circle of the correct choice corresponding to the question number.
5. To change your answer, erase the earlier mark clearly and mark the new answer. It is better to use a pencil if you want to change your answers.
6. Some questions may have more than one correct answer. In that case, it is indicated as part of the question. You must mark all the correct answers. Partial answers will be considered wrong.
7. Wrong answers will carry negative marks. Therefore, do not guess answers.
8. Do not use any tools like calculators, cell phones during the test.
9. Switch off your cell phone now.
10. After completing the test, you must return all the papers including this test paper, answer sheet and the rough sheets.

We wish you the very best!

Do not turn this page. Wait until you are asked to do so.

1. The number of possible ordered trees with 3 nodes A, B, C is

- A) 16
- B) 12
- C) 6
- D) 14

2. #include <iostream.h>

```
class A
{
    private:
        int i;
    public:
        A(){
            cout << "Came inside constructor";
        }
        virtual void func() = 0;
};
void A::func()
{
    cout << "Came inside the function of A class" << endl;
}
int main()
{
    A aObj;

    aObj.func();
    return 0;
}
```

The output is:

- A) Came inside constructor
- B) Came inside the function of A class Came inside constructor
- C) Came inside constructor Came inside the function of A class
- D) Compilation error

3. String::~~String() {
 cout << " String() " << endl;
}

Assuming that all the necessary using-directives have been made, in the sample code above, which one of the following statements pertaining to the destructor is TRUE?

- A) The destructor should be ~String::String().
 - B) The destructor is incorrect because it is declared outside the class definition.
 - C) The destructor has been defined correctly.
 - D) The destructor is incorrect because of the scope resolution operator ::
4. In deciding which search algorithm to use on a list, which of the following should not be a factor in your decision?

- A) The length of the list to be searched
- B) Whether or not the list contains negative numbers
- C) Whether or not the list is already in sorted order
- D) The number of times the list is to be searched

5. `#include <iostream.h>`
`int main()`
`{`
`for (int i = 4; i > 2; i--) {`
`switch (i) {`
`case 1 :`
`cout << "In case 1";`
`break;`
`case 2 :`
`cout << "In case 2";`
`break;`
`case 3 :`
`cout << "In case 3";`
`break;`
`case default :`
`cout << "In case default";`
`break;`
`}`
`}`
`return 0;`
`}`

The output is:

- A) In case default, In case 3
 - B) In case 1, In case 2
 - C) No output
 - D) Compilation error
6. If we use struct to get the same functionality as classes in C++
- A) The members are public by default instead of private.
 - B) The members are private by default instead of public.
 - C) The members are protected by default instead of private.
 - D) The members are protected by default instead of public.

7. Suppose we have a List class with private data listVals (an array holding the list items) and listLength (a variable indicating the current list length). What does the following function do?

```
void List::Mystery()
{
    ItemType beta;
    int count1;
    int count2;
    int i;
    for (count1 = 0; count1 < listLength - 1; count1++)
    {
        i = count1;
        for (count2 = count1 + 1; count2 < listLength; count2++)
            if (listVals[count2] > listVals[i])
                i = count2;
        beta = listVals[i];
        listVals[i] = listVals[count1];
        listVals[count1] = beta;
    }
}
```

- A) It inserts a new item into a sorted list.
B) It inserts a new item into an unsorted list.
C) It sorts a list into ascending order.
D) It sorts a list into descending order.
8. Given the declaration
`int listVals[7] = {10, 15, 20, 25, 30, 35, 40};`
a binary search is used to search the list for the value 35. In each iteration of the search loop, the index variables first, middle, and last define the range of items being searched. When the search is finished, what is the value of first? (Remember that C++ arrays begin at index 0.)
- A) 0
B) 2
C) 3
D) 4

9. `#include<stdio.h>`
`#include<malloc.h>`
`int main()`
`{`
 `char *mem[5];`
 `for (int i = 0; i < 5; i++)`
 `mem[i]=(char*)malloc(sizeof(5));`
 `return 0;`
`}`

For memory allocation done as above which is the correct way to free the memory?

- A) None of the two options mentioned;
B) `free(mem);`
C) `for (int i = 0; i < 5; i++) free(mem[i]);`
D) Any of the two options mentioned;

10. Which of the following statement is valid for string copy?

```
char *str, *ptr;
```

A) While (*str)

```
{
    *str=*ptr;
    ++str=++ptr;
}
```

B) While (*str)

```
{
    *++str=*++ptr
};
```

C) While (*ptr)

```
{
    *str = *ptr;
    ++ptr, ++str;
}
```

```
*str=*ptr;
```

D) While (*str)

```
{
    *str = *ptr;
    ++str, ++ptr;
};
```

```
*str = *ptr;
```

11. #include <stdio.h>

```
int main()
```

```
{
```

```
    int arr[] = { 2,4,6,7,8};
```

```
    int i,*p;
```

```
    for (p = arr, i = 0; p + i <= arr + 4; p++,i++)
```

```
        printf("%d ", *(p+i));
```

```
}
```

The output is:

A) 4 7 8

B) 2 4 6

C) 2 6 8

D) 2 7 8

12. Print the output of the program

```
#include <stdio.h>
main()
{
    struct Data {
        int a;
        int b;
    } y[4] = { 1, 10, 3, 30, 2, 20, 4, 40};
    struct Data *x = y;
    int i;
    for(i=0; i<4; i++) {
        x->a = x->b, ++x++->b;
        printf("%d %d\t", y[i].a, y[i].b);
    }
}
```

- A) 10 11 30 31 20 21 40 41
- B) 11 10 31 30 21 20 41 40
- C) 1 10 3 30 2 20 4 40
- D) 10 10 30 30 20 20 40 40

13. If the following program (myprog) is run from the command line as myprog 1 2 3, what would be the output?

```
main(int argc, char*argv[])
{
    int i;
    i=argv[1]+argv[2]+argv[3];
    printf("%d",i);
}
```

- A) 123
- B) 6
- C) error
- D) "123"

14. The minimum number of times the while loop is executed is

- A) 0
- B) 1
- C) 2
- D) Can not be predicted

15. struct f { int x;};
int f(int x) { printf("%d\n" , x);}
main ()
{
 int x = 10;
 f(x);
}

- A) 10
- B) Error
- C) Will not compile
- D) None of the options mentioned

16. The following operations executed on a stack machine will evaluate which postfix expression ?

```
PUSH A
PUSH B
PUSH C
ADD
POP E
PUSH E
PUSH E
MULT
ADD
POP F
```

- A) $F = E + E$
- B) $F = A * (B + C)$
- C) $F = A + (B + C) * (B + C)$
- D) $F = B + C + (B + C) * (B + C)$

17. #include <iostream.h>

```
int main(int argc, char *argv[])
{
    cout << argv[0] << argv[1] << argv[2];
    return 0;
}
```

The above program is run as ./a.out 1 2 3: What will be the output ?

- A) ./a.out 1 2 3
- B) a.out 1 2
- C) ./a.out 1 2
- D) a.out 1 2 3

18. Causes fragmentation of the free store

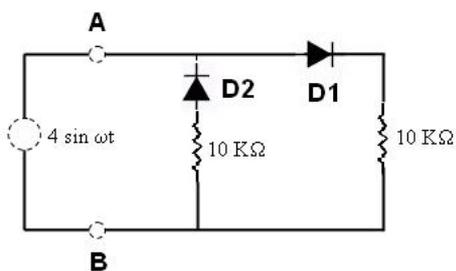
- A) Array and Vector
- B) Vector and Linked List
- C) Linked List
- D) All of the options

19. Which infix expression corresponds to the postfix expression $a b c + d e + g h * * + +$

- A) $(a+b+c)+((d+e)*(g*h))$
- B) $a+(b+c)+((d+e)*(g*h))$
- C) $a*(b+c)+(d+e)+(g*h))$
- D) None of the options mentioned

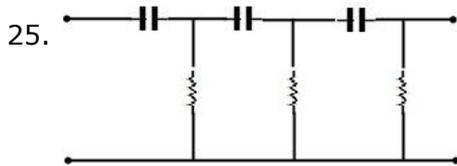
20. A Queue of characters currently contains a, b, c, d. What would be the contents of the queue after the following operations:
1. A deletion
 2. The addition of w then of x
 3. A deletion
 4. The addition of y
- A) a, b, c, w, y
 B) Y, x, c, d
 C) Y, x, w, a, b
 D) c, d, w, x, y
21. An amplifier's rise time is 200 ns. Its upper 3-dB frequency is
- A) 1.5 MHz
 B) 60 MHz
 C) 70 KHz
 D) 1.75 MHz
22. An opamp has an open-loop gain of 105 and an open-loop upper cut-off frequency of 10 Hz. If this opamp is connected as an amplifier with a closed-loop gain of 100, then the new upper cutoff frequency is
- A) 10 Hz
 B) 100 Hz
 C) 10 KHz
 D) 100 KHz
23. Thermal runaway is not possible in FET because as the temperature of FET increases
- A) The mobility decreases
 B) The transconductance increases
 C) The drain current increases
 D) None of the options mentioned

24.



A voltage source $V_{AB} = 4 \sin(\omega t)$ is applied to the terminals A and B of the circuit shown in the given figure. The diodes are assumed to be ideal. The impedance by the circuit across the terminals A and B is

- A) 5 Kohm
 B) 10 Kohm
 C) 15 Kohm
 D) 20 Kohm



RC network shown in the given figure can provide a maximum theoretical phase shift of

- A) 90 degrees
 - B) 180 degrees
 - C) 270 degrees
 - D) 360 degrees
26. Following statement about conditions that make a meta-semiconductor contact rectifying are given as:
1. N-type semiconductor with its work functions S , greater then the work function M of the metal
 2. N-type semiconductor with its work functions S , smaller then the work function M of the metal
 3. P-type semiconductor with its work functions S , greater then the work function M of the metal
 4. P-type semiconductor with its work functions S , smaller then the work function M of the metal
- Of these statement:
- A) 1 and 3 are correct
 - B) 2 and 4 are correct
 - C) 1 and 4 are correct
 - D) 2 and 3 are correct
27. The logic gate added to one of the inputs of a binary adder to change it into a binary adder-subtractor is:
- A) AND
 - B) OR
 - C) XOR
 - D) NOR
28. The ring counter is analogous to
- A) S-R flip-flop
 - B) latch
 - C) stepping switch
 - D) toggle switch
29. Consider a high speed 40 ns memory cache with a successful hit ratio 80%. The regular memory has a access time of 100 ns. What is the average effective time for CPU to access memory?
- A) 52 ns
 - B) 60 ns
 - C) 70 ns
 - D) 80 ns

30. An Intel 8085 processor is executing the program given below.

```
MVI A,10H
MVI B,10H
BACK: NOP
ADD B
RLC
JNC BACK
HLT
```

The number of times the operation NOP will be executed is equal to

- A) 1
 - B) 2
 - C) 3
 - D) 4
31. A memory system has a total of 8 memory chips, each with 12 address lines and 4 data lines. The total size of the memory system is
- A) 6 kbytes
 - B) 16 kbytes
 - C) 32 kbytes
 - D) 64 kbytes
32. If each address space represents one byte of storage space, how many address lines are needed to access RAM chips arranged in a 4x6 arrays, where each chip is 8k x 4 bits ?
- A) 17
 - B) 13
 - C) 15
 - D) 16
33. The dual of the Boolean theorem $A.(B+C) = A.B+A.C$ is
- A) $A.(B+C)=(A+B)(A+C)$
 - B) $A+B.C=(A+B)(A+C)$
 - C) $A+(B+C) =A.B+A.C$
 - D) None of the options mentioned

34.

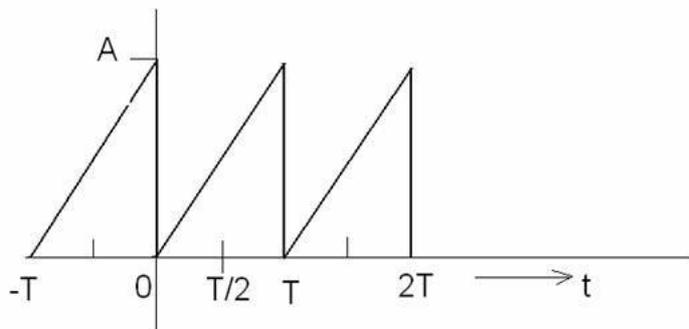


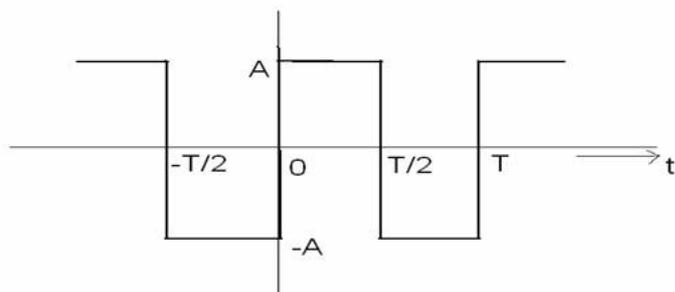
Figure given above shows a triangular periodic wave from $f_1(t)$. Consider $f_2(t) = f_1(t) - (A/2)$. $f_2(t)$ has

- (i) the constant term of zero value
- (ii) only cosine terms in its Fourier series
- (iii) has only sine terms in its Fourier series wave symmetry
- (iv) has half-wave symmetry

Of these four statements the only true statements are

- A) (i) and (ii)
- B) (i) and (iii)
- C) (ii) and (iv)
- D) (iii) and (iv)

35.



The periodic function shown in the figure above

- A) is even and has no half-wave symmetry
- B) is odd and has no half-wave symmetry
- C) is even and has half-wave symmetry
- D) is odd and has half-wave symmetry

36. L.O.S. microwave analogue radio-relay links normally use a modulation format which is

- A) TDM-PPM
- B) FDM-FM
- C) FDM-SSB
- D) none of the options mentioned

37. Two carriers 40 MHz and 80 MHz respectively are frequency modulated by a signal of frequency 4 kHz, such that the band-widths of the FM signal in the two cases are the same. The peak value deviation in the two cases are in the ratio of

- A) 1:4
- B) 1:2
- C) 1:1
- D) 2:1

38. In a radio receiver AGC is used to

- A) improve selectivity of the receiver
- B) improve noise figure of the receiver
- C) maintain the carrier level at the second detector input constant
- D) maintain the carrier level at the second detector input variable

39. If $f(t) = -f(-t)$ and $f(t)$ satisfy the Dirichlet's conditions then $f(t)$ can be expanded in a FS containing
- A) sine terms and a constant term
 - B) Only sine terms
 - C) Only cosine terms
 - D) cosine terms and a constant term
40. With which of the following three point tracking is achieved?
- A) Double conversion
 - B) Variable selectivity
 - C) Padder capacitor
 - D) Double spotting