1.)Assume that float takes 4 bytes, predict the output of the following the program.

|  |
| --- |
| #include <stdio.h>    int main()  {  float arr[5] = {12.5, 10.0, 13.5, 90.5, 0.5};  float \*ptr1 = &arr[0];  float \*ptr2 = ptr1 + 3;    printf("%f ", \*ptr2);  printf("%d", ptr2 - ptr1);    return 0;  }  a)90.500000 3  b)90.500000 12  c)10.000000 12  d)0.500000 3  Answer: a  When we add a value x to a pointer p, the value of the resultant expression is p + x\*sizeof(\*p) where sizeof(\*p) means the size of data type pointed by p. That is why ptr2 is incremented to point to arr[3] in the above code. The same rule applies for subtraction. Note that only integral values can be added or subtracted from a pointer. We can also subtract or compare two pointers of the same type. |

2. #include <stdio.h>

int main()

{

register int i = 10;

int \*ptr = &i;

printf("%d", \*ptr);

return 0;

}

a)Prints 10 on all compilers

b)May generate compiler Error

c)Prints 0 on all compilers

d)May generate runtime Error

Answer: b)

https://www.geeksforgeeks.org/understanding-register-keyword/

3. Database table by name Loan\_Records is given below.

Borrower Bank\_Manager Loan\_Amount

Ramesh Sunderajan 10000.00

Suresh Ramgopal 5000.00

Mahesh Sunderajan 7000.00

What is the output of the following SQL query?

SELECT Count(\*)

FROM ( (SELECT Borrower, Bank\_Manager

FROM Loan\_Records) AS S

NATURAL JOIN (SELECT Bank\_Manager,

Loan\_Amount

FROM Loan\_Records) AS T );

a)3

b)9

c)5

d)6

Answer:c)

See Question 3 of <http://www.geeksforgeeks.org/database-management-systems-set-4/>

4. What is the use of "#pragma once"?

a)Used in a header file to avoid its inclusion more than once

b)Used to avoid multiple declarations of the same variable.

c)Used in a c file to include a header file at least once.

d)Used to avoid assertions

Answer: a)

5. Three people A, B and C working individually can finish a job in 10, 12 and 20 days respectively. They decided to work together but after 2 days, A left the work and after another one day, B also left work. If they got two lacs collectively for the entire work, find the difference between the highest and lowest share.

a)70000

b)60000

c)10000

d)20000

Answer: a)

Let the total work be LCM(10, 12, 20) = 60 units => Efficiency of A = 60/10 = 6 units / day => Efficiency of B = 60/12 = 5 units / day => Efficiency of C = 60/20 = 3 units / day Since the number of working days are different for each person, the share of each will be calculated in the ratio of the units of work done. Now, A works for 2 days and B works for 3 days. => Work done by A = 2 x 6 = 12 units => Work done by B = 3 x 5 = 15 units => Work done by C = 60 - 12 - 15 = 33 units Therefore, ratio of work done = 12:15:33 = 4:5:11 So, A's share = (4/20) x 2,00,000 = Rs 40,000 B's share = (5/20) x 2,00,000 = Rs 50,000 C's share = (11/20) x 2,00,000 = Rs 1,10,000 Therefore, difference of the highest and lowest share = Rs 1,10,000 - 40,000 = Rs 70,000

6. A tourist covers half of his journey by train at 60 km/h, half of the remainder by bus at 30 km/h and the rest by cycle at 10 km/h. The average speed of the tourist in km/h during his entire journey is

a)36

b)30

c)24

d)18

Answer:c

Let total distance be D Total Time = D(1/2\*60 + 1/4\*30 + 1/4\*10) = D/24 Average Speed = Total distance / Total time = 24

7. Given the sequence of terms, AD CG FK JP, the next term is

a)OV

b)OW

c)PV

d)PW

Answer: a

**Explanation:** Here 1st letter of each term in order are: A C F J

Now In alphabets, A and C have a difference of 1 alphabet, C and F have a difference of 2, and F and J have a difference of 3. Hence next term here should contain its 1st letter as an alphabet with a difference of 4 after J, i.e O.

Similarly, 2nd letter of each term in order are: D G K P

Now In alphabets, D and G have a difference of 2 alphabets, G and K have a difference of 3, and K and P have a difference of 4. Hence next term here should contain its 2nd letter as an alphabet with a difference of 5 after P, i.e V.

8. The following C function takes a simply-linked list as an input argument. It modifies the list by moving the last element to the front of the list and returns the modified list. Some part of the code is left blank. Choose the correct alternative to replace the blank line.

typedef struct node

{

int value;

struct node \*next;

}Node;

Node \*move\_to\_front(Node \*head)

{

Node \*p, \*q;

if ((head == NULL: || (head->next == NULL))

return head;

q = NULL; p = head;

while (p-> next !=NULL)

{

q = p;

p = p->next;

}

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

return head;

}

a)q = NULL; p->next = head; head = p;

b)q->next = NULL; head = p; p->next = head;

c)head = p; p->next = q; q->next = NULL;

d)q->next = NULL; p->next = head; head = p;

Answer :d

Explanation:

See question 1 of <http://www.geeksforgeeks.org/data-structures-and-algorithms-set-24/>

9. Which of the following is a true about Binary Trees

a)Every binary tree is either complete or full.

b)Every complete binary tree is also a full binary tree

c)Every full binary tree is also a complete binary tree.

d)No binary tree is both complete and full.

e)None of the above

Answer:e

10.Which one of the following correctly determines the solution of the recurrence relation with T(1) = 1?

T(n) = 2T(n/2) + Logn

a)Θ(n)

b)Θ(nLogn)

c)Θ(n\*n)

d)Θ(log n)

Answer: a

Q1)

A complete n-ary tree is a tree in which each node has n children or no children. Let I be the number of internal nodes and L be the number of leaves in a complete n-ary tree. If L = 41, and I = 10, what is the value of n?

A)3

B)4

C)5

D)6

Ans:5

Explantion: L = (n-1)\*I + 1

Q2)

Predict the value of result

Assume size of int as 4

#include <stdio.h>

int main()

{

int a = 5;

printf("%d\n", sizeof(++a)+sizeof(a++)+sizeof(--a));

int result=++a;

printf("%d\n",result);

return 0;

}

A)5

B)6

C)7

D)8

Ans) 6

Q3)

Predict the output

char \*getString()

{

char str[] = "GfG"; /\* Stored in stack segment \*/

/\* Problem: string may not be present after getSting() returns \*/

return str;

}

int main()

{

printf("%s", getString());

getchar();

return 0;

}

A)Compiler Error

B)Gfg

C)null/Garbage Value3

Ans:C

Q4)

Pick the best statement for the following program snippet:

#include <stdio.h>

int main()

{

int var; /\*Suppose address of var is 2000 \*/

void \*ptr = &var;

\*ptr = 5;

printf("var=%d and \*ptr=%d",var,\*ptr);

return 0;

}

A)It will print “var=5 and \*ptr=2000”

B)It will print “var=5 and \*ptr=5”

C)It will print “var=5 and \*ptr=XYZ” where XYZ is some random address

D)Complier error

Ans:D

Explanation:

Key point in the above snippet is dereferencing of void pointer. It should be noted that dereferencing of void pointer isn’t allowed because void is an incomplete data type. The correct way to assign value of 5 would be first to typecast void pointer and then use it. So instead of \*ptr, one should use \*(int \*)ptr

Q5)

A priority queue is implemented as a Max-Heap. Initially, it has 5 elements.

The level-order traversal of the heap is: 10, 8, 5, 3, 2. Two new elements 1 and 7 are inserted into the heap in that order.

The level-order traversal of the heap after the insertion of the elements is:

A)10, 8, 7, 3, 2, 1, 5

B)10, 8, 7, 2, 3, 1, 5

C)10, 8, 7, 1, 2, 3, 5

D)10, 8, 7, 5, 3, 2, 1

Ans:A

Q6)

A hash function h defined h(key)=key mod 7, with linear probing, is used to insert the keys 44, 45, 79, 55, 91, 18, 63 into a table indexed from 0 to 6.

What will be the location of key 18 ?

A)3

B)4

C)5

D)6

Ans:5

Q7)

The number of rotations required to insert a sequence of elements 9,6,5,8,7,10 into an empty AVL tree is?

A)0

B)1

C)2

D)3

Ans:3

Q8)

Pointing to a photograph Anjali said, "He is the son of the only son of my grandfather." How is the man in the photograph related to Anjali?

A) Brother

B) Uncle

C) Son

D) Data is inadequate

Ans:A

Explanation:

The man in the photograph is son of Anjali's grandfather's son i.e., the son of Anjali's father. Hence, the boy is the brother of Anjali.

Question 9,10 are based on the following paragraph

In a class there are seven students (including boys and girls) A, B, C, D, E, F and G. They sit on three benches I, II and III. Such that at least two students on each bench and at least one girl on each bench. C who is a girl student, does not sit with A, E and D. F the boy student sits with only B. A sits on the bench I with his best friends. G sits on the bench III. E is the brother of C.

Q9) Who sits with C ?

A) B

B) D

C) G

D) E

Ans:C

Q10)On which bench there are three students ?

A) Bench I

B) Bench II

C) Bench III

D) Bench I or II

Ans: A

1. Two friends A and B were employed to do a work. Initial deadline was fixed at 24 days. Both started working together but after 20 days, A left the work and the whole work took 30 days to complete. In how much time can B alone can do the work?

**(A)** 40

**(B)** 50

**(C)** 60

**(D)** 70

**Answer:** **(C)**

**Explanation:** Let the total work be 24 units. It is given that A and B together can do the work in 24 days.

=> Combined efficiency of A and B = 24/24 = 1 unit / day

=> Work done in 20 days = 20 units

=> Work left = 24 – 20 = 4 units

Now, this remaining 4 units of work was done by B alone in 10 days.

=> Efficiency of B = 4/10 = 0.4

Therefore, time required by B alone to do the work = 24/0.4 = 60 days

2. Which one of the following options is the closest in meaning to the word given below?

**Nadir**

**(A)** Highest

**(B)** Lowest

**(C)** Medium

**(D)** Integration

**Answer:** **(B)**

**Explanation:** Nadir means below

1. Astronomy A point on the celestial sphere directly below the observer, diametrically opposite the zenith.

2. The lowest point: the nadir of their fortunes.

Source:<http://www.thefreedictionary.com/nadir>

3. Which of the following operators can be applied on structure variables?

**(A)** Equality comparison ( == )

**(B)** Assignment ( = )

**(C)** Both of the above

**(D)** None of the above

**Answer:** **(B)**

**Explanation:** A structure variable can be assigned to other using =, but cannot be compared with other using ==

|  |
| --- |
| 4. class Base {  public final void show() {  System.out.println("Base::show() called");  }  }  class Derived extends Base {  public void show() {  System.out.println("Derived::show() called");  }  }  public class Main {  public static void main(String[] args) {  Base b = new Derived();;  b.show();  }  } |

**(A)** Derived::show() called

**(B)** Base::show() called

**(C)** Compiler Error

**(D)** Exception

**Answer:** **(C)**

**Explanation:** compiler error: show() in Derived cannot override show() in Base

|  |
| --- |
| 5. Father is aged three times more than his son Ronit. After 8 years, he would be two and a half times of Ronit's age. After further 8 years, how many times would he be of Ronit's age? |
| |  |  | | --- | --- | | A. | 2 times | | B. | |  |  |  | | --- | --- | --- | | 2 | 1 | times | | 2 | | | C. | |  |  |  | | --- | --- | --- | | 2 | 3 | times | | 4 | | | D. | 3 times |   Answer: Option A  Explanation:  Let Ronit's present age be *x* years. Then, father's present age =(*x* + 3*x*) years = 4*x* years.   |  |  |  |  | | --- | --- | --- | --- | |  | (4*x* + 8) = | 5 | (*x* + 8) | | 2 |   8*x* + 16 = 5*x* + 40  3*x* = 24  *x* = 8.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Hence, required ratio = | (4*x* + 16) | = | 48 | = 2. | | (*x* + 16) | 24 | |

|  |
| --- |
| 6. 39 persons can repair a road in 12 days, working 5 hours a day. In how many days will 30 persons, working 6 hours a day, complete the work? |
| |  |  | | --- | --- | | A. | 10 | | B. | 13 | | C. | 14 | | D. | 15 |   Answer: Option B  Explanation:  Let the required number of days be *x*.  *Less persons, More days (Indirect Proportion)*  *More working hours per day, Less days (Indirect Proportion)*   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Persons | 30 | : | 39 |  | **::** 12 : *x* | | Working hours/day | 6 | : | 5 |   30 x 6 x *x* = 39 x 5 x 12   |  |  | | --- | --- | | *x* = | (39 x 5 x 12) | | (30 x 6) |   *x* = 13. |
| 7. If A = *x*% of *y* and B = *y*% of *x*, then which of the following is true? |
| |  |  | | --- | --- | | A. | A is smaller than B. | | B. | A is greater than B | | C. | Relationship between A and B cannot be determined. | | D. | If *x* is smaller than *y*, then A is greater than B. | | E. | None of these |   Answer: Option E  Explanation:   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | *x*% of *y* = |  | *x* | x *y* |  | = |  | *y* | x *x* |  | = *y*% of *x* | | 100 | 100 |   A = B. |

8. Assume that the size of int is 4.

|  |
| --- |
| #include <stdio.h>  void f(char\*\*);  int main()  {  char \*argv[] = { "ab", "cd", "ef", "gh", "ij", "kl" };  f(argv);  return 0;  }  void f(char \*\*p)  {  char \*t;  t = (p += sizeof(int))[-1];  printf("%s\n", t);  } |

**(A)** ab

**(B)** cd

**(C)** ef

**(D)** gh

**Answer:** **(D)**

**Explanation:** The expression (p += sizeof(int))[-1] can be written as (p += 4)[-1] which can be written as (p = p+4)[-] which returns address p+3 which is address of fourth element in argv[].

9. Which of the following standard algorithms is not a Greedy algorithm?

**(A)** Dijkstra’s shortest path algorithm

**(B)** Prim’s algorithm

**(C)** Kruskal algorithm

**(D)** Huffman Coding

**(E)** Bellmen Ford Shortest path algorithm

**Answer:** **(E)**

**Explanation:** See<https://www.geeksforgeeks.org/greedy-algorithms-set-1-activity-selection-problem/> and<https://www.geeksforgeeks.org/dynamic-programming-set-23-bellman-ford-algorithm/>

10. Consider the following recursive C function that takes two arguments

|  |
| --- |
| unsigned int foo(unsigned int n, unsigned int r) {  if (n > 0) return (n%r + foo (n/r, r ));  else return 0;  } |

What is the return value of the function foo when it is called as foo(345, 10) ?

**(A)** 345

**(B)** 12

**(C)** 5

**(D)** 3

**Answer:** **(B)**

**Explanation:** The call foo(345, 10) returns sum of decimal digits (because r is 10) in the number n. Sum of digits for 345 is 3 + 4 + 5 = 12.

**Q.** There is a fairy island where lives a Knight, a Knave, and a Spy. You go there and meet three people suppose A, B, and C, one of whom is a knight, one a knave, and one a spy. It is known that the knight always tells the truth, the knave always lies, and the spy can either lie or tell the truth.

· *A says: “C is a knave.”*

· *B says: “A is a knight.”*

· *C says: “I am the spy.”*

So who is the knight, who the knave, and who the spy?

**Answer:** A = Knight, B = Spy, C = Knave

**Solution:**

*Let us say A is the Knight, then he speaks the truth and C is Knave who lied and finally B is Knave, who speaks the truth regarding A. So this condition holds.*

*Let us say B is the knight. then it contradicts the answer since a knight always speaks the truth and there cannot be two knights.*

*Same goes with C.*

**Q.** A man completes a journey in 10 hours. He travels first half of the journey at the rate of 21 km/hr and second half at the rate of 24 km/hr. Find the total journey in km.

a) 220 km

b) 234 km

c) 230 km

d) 224 km

**Answer:** d) 224 km

***Solution:***

*According to the question,*

*((1/2)x)/21 + ((1/2)x)/24 = 10*

*Solving this equation we get 15x = 168 \* 20*

*Further x = (168 \* 20)/15 = 224 km.*

**Q.** A cistern can be filled by a tap in 4 hours while it can be emptied by another tap in 9 hours. If both the taps are opened simultaneously, then after how much time cistern will get filled?

a) 7 hours

b) 7.1 hours

c) 7.2 hours

d) 7.3 hours

**Answer:** 7.2 hours

***Solution:***

*So according to the question,*

*1/4 th of the cistern can be filled in one hour*

*1/9 th of the cistern can be emptied in 1 hour*

*Therfore, net filled in 1 hour = 1/4 – 1/9 = 5/36*

*So cistern that can be filled in 36/5 hours = 7.2 hours*

**Q. (easy)**All even numbers from 2 to 98 inclusive the both, are to be multiplied together. What is the unit digit of the product?

a) 2

b) 0

c) 6

d) 4

**Answer:** b) 0

**Q.** A team of 11 is needed to be formed who are to be selected from 5 men and 11 women, with the restriction of selecting not more than 3 men. In how many ways can the selection be done?

a) 1121

b) 1565

c) 1243

d) 2256

**Answer:** d) 2256

***Solution:***

*Selecting 0 men and 11 women = 5C0 \* 11C11 = 1*

*Selecting 1 men and 10 women = 5C1 \* 11C10 = 55*

*Selecting 2 men and 9 women = 5C2 \* 11C9 = 10 \* 55 = 550*

*Selecting 3 men and 8 women = 5C3 \* 11C8 = 10 \* 165 = 1650*

*So total number of ways = 1650 + 550 + 55 + 1 = 2256 way*

**Q.** The following statement where T is true and F is false T&&T||F&&T

a) is True

b) is False

c) not applicable in C language

d) throws an error : parenthesis needed

Answer: Option A.

|  |  |
| --- | --- |
|  | **Q**. Which of the following is correct way to define the function fun() in the below program?  #include<stdio.h>    int main()  {  int a[3][4];  fun(a);  return 0;  }    a) void fun (int p[ ] [4])  {  }    b) void fun (int \*p [4])  {  }  c) void fun (int \*p[ ] [4])  {  }  d) void fun (int \*p[3] [4])  {  } |
| Answer: Option A  Explanation:  void fun(int p[][4]){ } is the correct way to write the function fun(). while the others are considered only the function fun() is called by using call by reference      **Q.** Which of the following statement is correct?  A. Once a reference variable has been defined to refer to a particular variable it can refer to any other variable.  B. A reference is indicated by using && operator.  C. Once a reference variable has been defined to refer to a particular variable it cannot refer to any other variable.  D. A reference can be declared beforehand and initialized later.      Answer: Option C |

**Q.**

Assunming, integer is 2 byte, What will be the output of the program?

#include<stdio.h>

int main()

{

printf("%x\n", -1>>1);

return 0;

}

A. ffff

B. 0fff

C. 0000

D. fff0

Answer: Option A

|  |  |
| --- | --- |
| Negative numbers are treated with 2's complement method.    1's complement: Inverting the bits ( all 1s to 0s and all 0s to 1s)  2's complement: Adding 1 to the result of 1's complement.  Binary of 1(2byte) : 0000 0000 0000 0001  Representing -1:  1s complement of 1(2byte) : 1111 1111 1111 1110  Adding 1 to 1's comp. result : 1111 1111 1111 1111  Right shift 1bit(-1>>1): 1111 1111 1111 1111 (carry out 1)  Hexadecimal : f f f f  (Filled with 1s in the left side in the above step)  Note:    1. Fill with 1s in the left side for right shift for negative numbers.  2. Fill with 0s in the right side for left shift for negative numbers.  3. Fill with 0s in the left side for right shift for positive numbers.  4. Fill with 0s in the right side for left shift for positive numbers. |  |

**Q.** What will be the output of the program ?

#include<stdio.h>

int main()

{

union var

{

int a, b;

};

union var v;

v.a=10;

v.b=20;

printf("%d\n", v.a);

return 0;

}

A. 10

B. 20

C. 30

D. 0

Answer: Option B

**Q.** What will be the output of the program ?

#include<stdio.h>

int main()

{

enum days {MON=-1, TUE, WED=6, THU, FRI, SAT};

printf("%d, %d, %d, %d, %d, %d\n", MON, TUE, WED, THU, FRI, SAT);

return 0;

}

A. -1, 0, 1, 2, 3, 4

B. -1, 2, 6, 3, 4, 5

C. -1, 0, 6, 2, 3, 4

D. -1, 0, 6, 7, 8, 9

Answer: Option D

Q Consider the following function that takes reference to head of a Doubly Linked List as parameter. Assume that a node of doubly linked list has previous pointer as *prev* and next pointer as *next*.

void fun(struct node \*\*head\_ref)

{

struct node \*temp = NULL;

struct node \*current = \*head\_ref;

while (current != NULL)

{

temp = current->prev;

current->prev = current->next;

current->next = temp;

current = current->prev;

}

if(temp != NULL )

\*head\_ref = temp->prev;

}

1. 2 <--> 1 <--> 4 <--> 3 <--> 6 <-->5
2. 5 <--> 4 <--> 3 <--> 2 <--> 1 <-->6.
3. 6 <--> 5 <--> 4 <--> 3 <--> 2 <--> 1
4. 6 <--> 5 <--> 4 <--> 3 <--> 1 <--> 2

Answer: c

Q The following C function takes a single-linked list of integers as a parameter and rearranges the elements of the list. The function is called with the list containing the integers 1, 2, 3, 4, 5, 6, 7 in the given order. What will be the contents of the list after the function completes execution?

struct node

{

int value;

struct node \*next;

};

void rearrange(struct node \*list)

{

struct node \*p, \* q;

int temp;

if ((!list) || !list->next)

return;

p = list;

q = list->next;

while(q)

{

temp = p->value;

p->value = q->value;

q->value = temp;

p = q->next;

q = p?p->next:0;

}

}

1. 1,2,3,4,5,6,7
2. 2,1,4,3,6,5,7
3. 1,3,2,5,4,7,6
4. 2,3,4,5,6,7,1

Answer: b

Q What is the time complexity of Huffman Coding?

1. O(N)
2. O(NlogN)
3. O(N(logN)^2)
4. O(N^2)

Answer: b

Q In a k-way set associative cache, the cache is divided into v sets, each of which consists of k lines. The lines of a set are placed in sequence one after another. The lines in set s are sequenced before the lines in set (s+1). The main memory blocks are numbered 0 onwards. The main memory block numbered j must be mapped to any one of the cache lines from.

1. (j mod v) \* k to (j mod v) \* k + (k-1)
2. (j mod v) to (j mod v) + (k-1)
3. (j mod k) to (j mod k) + (v-1)
4. (j mod k) \* v to (j mod k) \* v + (v-1)

Answer: a

Q abstract class demo

{

public int a;

demo()

{

a = 10;

}

abstract public void set();

abstract final public void get();

}

class Test extends demo

{

public void set(int a)

{

this.a = a;

}

final public void get()

{

System.out.println("a = " + a);

}

public static void main(String[] args)

{

Test obj = new Test();

obj.set(20);

obj.get();

}

}

1. a =10
2. a=20
3. Compilation Error
4. Runtime Error

Answer: d

Q Consider three processes, all arriving at time zero, with total execution time of 10, 20 and 30 units, respectively. Each process spends the first 20% of execution time doing I/O, the next 70% of time doing computation, and the last 10% of time doing I/O again. The operating system uses a shortest remaining compute time first scheduling algorithm and schedules a new process either when the running process gets blocked on I/O or when the running process finishes its compute burst. Assume that all I/O operations can be overlapped as much as possible. For what percentage of time does the CPU remain idle?

1. 0%
2. 10.6%
3. 30%
4. 89.4%

Answer: b

Q What is recurrence for worst case of QuickSort and what is the time complexity in Worst case?

1. Recurrence is T(n) = T(n-2) + O(n) and time complexity is O(n^2)
2. Recurrence is T(n) = T(n-1) + O(n) and time complexity is O(n^2)
3. Recurrence is T(n) = 2T(n/2) + O(n) and time complexity is O(nLogn)
4. Recurrence is T(n) = T(n/10) + T(9n/10) + O(n) and time complexity is O(nLogn)

Answer: b

Q A 3-ary max heap is like a binary max heap, but instead of 2 children, nodes have 3 children. A 3-ary heap can be represented by an array as follows: The root is stored in the first location, a[0], nodes in the next level, from left to right, is stored from a[1] to a[3]. The nodes from the second level of the tree from left to right are stored from a[4] location onward. An item x can be inserted into a 3-ary heap containing n items by placing x in the location a[n] and pushing it up the tree to satisfy the heap property. Which one of the following is a valid sequence of elements in an array representing 3-ary max heap?

1. 1, 3, 5, 6, 8, 9
2. 9, 6, 3, 1, 8, 5
3. 9, 3, 6, 8, 5, 1
4. 9, 5, 6, 8, 3, 1

Answer: d

Q Following function is supposed to calculate the maximum depth or height of a Binary tree -- the number of nodes along the longest path from the root node down to the farthest leaf node.

int maxDepth(struct node\* node)

{

if (node==NULL)

return 0;

else

{

/\* compute the depth of each subtree \*/

int lDepth = maxDepth(node->left);

int rDepth = maxDepth(node->right);

/\* use the larger one \*/

if (lDepth > rDepth)

return X;

else return Y;

}

}

1. X = lDepth, Y = rDepth
2. X = lDepth + 1, Y = rDepth + 1
3. X = lDepth - 1, Y = rDepth -1
4. None of the above

Answer : b

Q The inorder and preorder traversal of a binary tree are d b e a f c g and a b d e c f g, respectively. The postorder traversal of the binary tree is:

1. d e b f g c a
2. e d b g f c a
3. e d b f g c a
4. d e f g b c a

Answer: a

Q Let G be a simple undirected graph. Let TD be a depth first search tree of G. Let TB be a breadth first search tree of G. Consider the following statements. (I) No edge of G is a cross edge with respect to TD. (A cross edge in G is between two nodes neither of which is an ancestor of the other in TD). (II) For every edge (u, v) of G, if u is at depth i and v is at depth j in TB, then ∣i − j∣ = 1. Which of the statements above must necessarily be true?

1. I only
2. II only
3. Both I and II
4. None

Answer: a

Q HTML(Hypertext Markup Language) has language elements which permit certain actions other than describing the structure of the web document. Which one of the following actions is NOT supported by pure HTML (without any server or client side scripting)pages?

1. Embed web objects from different sites into the same page
2. Refresh the page automatically after a specified interval
3. Automatically redirect to another page upon download
4. Display the client time as part of the page

Answer : d

Q Given an unsorted array. The array has this property that every element in array is at most k distance from its position in sorted array where k is a positive integer smaller than size of array. Which sorting algorithm can be easily modified for sorting this array and what is the obtainable time complexity?

1. Insertion Sort with time complexity O(kn)
2. Heap Sort with time complexity O(nLogk)
3. Quick Sort with time complexity O(kLogk)
4. Merge Sort with time complexity O(kLogk)

Answer: b

Q What does fun2() do in general?

int fun(int x, int y)

{

if (y == 0) return 0;

return (x + fun(x, y-1));

}

int fun2(int a, int b)

{

if (b == 0) return 1;

return fun(a, fun2(a, b-1));

}

1. x\*y
2. x+x\*y
3. Xy
4. Yx

Answer: c

Q An algorithm performs (logN)1/2 find operations, N insert operations, (logN)1/2 operations, and (logN)1/2 decrease-key operations on a set of data items with keys drawn from a linearly ordered set. For a delete operation, a pointer is provided to the record that must be deleted. For the decrease-key operation, a pointer is provided to the record that has its key decreased. Which one of the following data structures is the most suited for the algorithm to use, if the goal is to achieve the best total asymptotic complexity considering all the operations?

1. Unsorted array
2. Min-heap
3. Sorted array
4. Sorted doubly linked list

Answer: a

Q #include<iostream>

using namespace std;

class Base

{

public:

virtual void show() = 0;

};

int main(void)

{

Base b;

Base \*bp;

return 0;

}

1. There are compiler errors in lines "Base b;" and "Base bp;"
2. There is compiler error in line "Base b;"
3. There is compiler error in line "Base bp;"
4. No compiler Error

Answer: b