DU PhD in Computer Science

Topic:- DU_J18_PHD_CS

1) Which of the following statements is true for TCP protocol?

[Question ID = 2770]

1. TCP is a connection-less unreliable protocol. [Option ID = 11080]
2. TCP is a connection-less reliable protocol. [Option ID = 11079]
3. TCP is a connection-oriented reliable protocol. [Option ID = 11077]
4. TCP is a connection-oriented unreliable protocol. [Option ID = 11078]

Correct Answer :-

- TCP is a connection-oriented reliable protocol. [Option ID = 11077]

2) The file space allocation of Unix Operating System is [Question ID = 2773]

1. Linked [Option ID = 11090]
2. Single level indexed [Option ID = 11091]
3. Multi-level Indexed [Option ID = 11092]
4. Contiguous [Option ID = 11089]

Correct Answer :-

- Multi-level Indexed [Option ID = 11092]

3) The worst-case time complexity of searching an element out of n elements is [Question ID = 2754]

1. $\theta(n)$ for complete binary tree and BST while $\theta(\log n)$ for AVL tree. [Option ID = 11015]

2. $\theta(n \log n)$ for complete binary tree, $\theta(n)$ for BST and $\theta(\log n)$ for AVL tree. [Option ID = 11014]

3. $\theta(n)$ for complete binary tree while $\theta(\log n)$ for BST and AVL tree. [Option ID = 11013]

4. $\theta(\log n)$ for complete binary tree, BST and AVL tree. [Option ID = 11016]

Correct Answer :-

- $\theta(n)$ for complete binary tree and BST while $\theta(\log n)$ for AVL tree. [Option ID = 11015]

4) This examination paper has 100 multiple-choice questions of one mark each, with each question having four choices only one of which is correct. Each incorrect answer fetches -0.25 mark. Suppose you choose all your answers randomly with uniform probability. Then the expected mark you obtain is [Question ID = 2759]

1. 6.25 [Option ID = 11036]
2. 0 [Option ID = 11033]
3. 37.5 [Option ID = 11035]
4. 17.5 [Option ID = 11034]

Correct Answer :-

- 6.25 [Option ID = 11036]

5) Suppose we are given pointers to *first* and *last* nodes of a singly linked list containing n elements (where each node contains pointer to the next node). Which of the following operations *cannot* be performed in time *independent* on the length of the linked list?

[Question ID = 2753]

1. Insert a new element as the last element. [Option ID = 11012]
2. Insert a new element as the first element. [Option ID = 11011]
3. Delete the first element. [Option ID = 11009]
4. Delete the last element. [Option ID = 11010]

Correct Answer :-

- Delete the last element. [Option ID = 11010]

6) A CPU has 32 bit address lines and 16 bit datalines. The maximum primary memory addressing capacity of the CPU is [Question ID = 2768]

1. 4 MB [Option ID = 11072]
2. 2 GB [Option ID = 11070]
3. 64 KB [Option ID = 11069]
4. 4 GB [Option ID = 11071]

Correct Answer :-
- 4 GB [Option ID = 11071]

7) Which of the following inter-process communication mechanism is most efficient in an operating system? [Question ID = 2772]

1. Semaphore [Option ID = 11087]
2. Shared memory [Option ID = 11085]
3. Message Passing [Option ID = 11086]
4. Message queue [Option ID = 11088]

Correct Answer :-
- Shared memory [Option ID = 11085]

8) In a QAM Modulation scheme, the baud-rate is 4 kilobaud/second. The lowest carrier frequency is 102 KHz. The bandwidth of the channel is 1 MHz. The number of digital channels created would be [Question ID = 2769]

1. 300 [Option ID = 11076]
2. 250 [Option ID = 11075]
3. 200 [Option ID = 11073]
4. 225 [Option ID = 11074]

Correct Answer :-
- 225 [Option ID = 11074]

9) To reduce thrashing in virtual memory, which of the following data structures is most suitable? [Question ID = 2774]

1. Queue [Option ID = 11096]
2. Array [Option ID = 11094]
3. Hashing [Option ID = 11095]
4. Stack [Option ID = 11093]

Correct Answer :-
- Stack [Option ID = 11093]

10)

III. In the context of Project Tiger, many observers have noted that the country is now home to approximately two-thirds of the tigers in the world. But many have sounded a note of caution and said a lot more effort is required before we can declare tiger populations to be robust over the long term in India. These efforts usually mean increasing vigilance against poaching of tigers and their prey, expanding existing tiger reserves.

However, there is an opposing group of public intellectuals that considers social justice to be of paramount importance in India. In their estimation, forests are as much cultural and social places as they are a habitat for wildlife. Forests are home to one in eight Indians, and tiger conservation has come at a terrible human cost; tribals have been forced out of forests, uprooted from their social and cultural context, deprived of education, development and livelihoods, plunged into poverty, and remained either unwilling or unable to integrate into the mainstream. Conservation of the tiger, they say, should not be at the cost of the fundamental rights of our citizenry.

In the last two decades or so, elected governments in India have sanctioned the cutting down of forests to build highways, flattened forests for coal and other minerals, and drowned out forests for dams, significantly devastating wildlife and forest dwellers alike. These sanctions are accompanied by statements of reassurance that it is possible to balance economic development with ecological and social concerns. Notwithstanding these platitudes, both conservationists and social justice activists feel short-changed by a government set on accelerating swiftly towards the edge of ecological destruction.

The great game playing out in the forests of our country continues. The tiger, forests, and forest dwellers will remain pawns in this great game. It remains to be seen if conservationists and social justice activists can reconcile their differences to collaboratively call out the conductor before it is curtains.

'a lot more effort is required' to save the tiger, says the author. What kind of 'effort' is required?

[Question ID = 53375]

1. Providing congenial environment for wildlife to flourish. [Option ID = 93488]
2. Ensuring they get their prey easily. [Option ID = 93487]
3. Saving tigers from being hunted, as also preserving their habitat. [Option ID = 93486]
4. All of these [Option ID = 93489]

Correct Answer :-

* Saving tigers from being hunted, as also preserving their habitat. [Option ID = 93486]

11)

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I. Generating clean renewable electricity is crucial for India where nearly 300 million people—about a quarter of its population—live without access to electricity. Today, India is one of the lowest per capita consumers of electricity in the world; even when people are connected to the electricity grid, they face frequent disruptions. Add to that the projected economic growth and the increase in population, and the demand for energy in India is expected to double by 2040.

According to Onno Ruhl, World Bank Country Director in India, with around 300 days of sunshine every year, India has among the best conditions in the world to harness solar energy. The rapid expansion of solar power can improve the quality of life for millions of Indians, especially for its poorest citizens. It can also create thousands of jobs in the solar industry and underpin progress in all areas of development, helping the country fulfill its dream of becoming the 'India of the future'.

But Energy storage systems play a vital role to enhance capacity firming and smoothing the variable and intermittent power output from solar plants. The need for Energy Storage is thus indispensable in lieu of growing share of solar power in India's energy basket.

With the year on year declining price trend of solar and energy storage technologies, the time is not very far when not only commercial and industrial customers but also residential customers would become prosumers where they will produce and consume the electricity in-house and this will be possible with the hybrid solution of solar and storage.

Another market, which will grow in the near future, will be second life of the battery where the batteries (after few modifications) from the electric vehicles after their life can be used for the solar applications which will further reduce the solution cost of solar plus storage.

Mark the statement that is NOT true:

[Question ID = 53373]

1. Both commercial and residential power users could become producer and consumers of solar power in the near future [Option ID = 93481]
2. Solar power will be the major source of power in the near future. [Option ID = 93479]
3. Solar power could be a driver of progress in all areas of development [Option ID = 93480]
4. Even today people face frequent power disruptions. [Option ID = 93478]

Correct Answer :-

• Solar power will be the major source of power in the near future. [Option ID = 93479]

12)

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How will the 'second life of the battery' benefit the consumers?

[Question ID = 53379]

1. People can have a mobile solar power production source. [Option ID = 93502]
2. The use of electric vehicle batteries for solar plus storage will reduce solar power costs. [Option ID = 93503]
3. All of these [Option ID = 93505]
4. Used car batteries will be used for solar applications. [Option ID = 93504]

Correct Answer :-

• The use of electric vehicle batteries for solar plus storage will reduce solar power costs. [Option ID = 93503]

13)

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Why is the author optimistic that soon residential customers would become prosumers?

[Question ID = 53377]

1. People are fast being drawn to the cheaper power source of solar energy. [Option ID = 93494]
2. Falling prices and better storage techniques will tempt people to be prosumers of solar energy. [Option ID = 93495]
3. Hybrid solution of solar and storage will make this possible. [Option ID = 93496]
4. All of these. [Option ID = 93497]

Correct Answer :-
* All of these. [Option ID = 93497]

14) Consider the following pseudocode that operates on a non-empty queue Q and uses a stack S

```
func(Queue *Q){
    Stack S;
    while(!isEmpty(Q)){
        elem =dequeue(Q);
        push(S,elem);
    }
    while(!isEmpty(S)){
        elem =pop(S);
        enqueue(Q,elem);
    }
}
```

Then *func* does the following

[Question ID = 53376]

Correct Answer :-

- Reverses the input queue Q. [Option ID = 93493]

15) Let $<f_n>$ be a sequence of functions defined on [0, 1] as follows

$$f_n(x) = \begin{cases} n^2, & if\ 0 \le x \le \frac{1}{2n} \\ -n^2 x + n, & if\ \frac{1}{2n} < x \le \frac{1}{n} \\ 0, & if\ \frac{1}{n} < x \le 1 \end{cases}$$

Then $f_n(x) \to f(x)\ \forall\ x \in [0, 1]$, which of the following is not satisfied?

[Question ID = 2737]

1. Each f_n is a continuous function. [Option ID = 10945]
2. f is a continuous function. [Option ID = 10946]
3. $\int_0^1 f_n(x)\,dx = \frac{1}{4}, n = 1, 2, 3, \dots$ [Option ID = 10947]
4. $\lim_{n \to \infty} \int_0^1 f_n(x)\,dx = \int_0^1 f(x)\,dx$ [Option ID = 10948]

Correct Answer :-

- $\lim_{n \to \infty} \int_0^1 f_n(x)\,dx = \int_0^1 f(x)\,dx$ [Option ID = 10948]

16) Let $\mathbb{R}$ be the set of real numbers and let $T: \mathbb{R}^3 \to \mathbb{R}^4$ be defined as $T(x, y, z) = (x + y + z, x + 2y - 3z, 2x + 3y - 2z, 3x + 4y - z)$. Then rank of the linear transformation T is

[Question ID = 2730]

1. 3 [Option ID = 10918]
2. 4 [Option ID = 10917]
3. 1 [Option ID = 10920]
4. 2 [Option ID = 10919]

Correct Answer :-

- 2 [Option ID = 10919]

17)

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'India has among the best conditions in the world to harness solar energy' How? [Question ID = 2740]

1. It has 300 days of sunshine in a year. [Option ID = 10957]
2. All of these [Option ID = 10960]
3. One-fourth of its population live without access to electricity [Option ID = 10959]
4. Its per capita consumption of power is among the lowest in the world. [Option ID = 10958]

Correct Answer :-
• It has 300 days of sunshine in a year. [Option ID = 10957]

18)

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Why is the need for Energy Storage indispensable? [Question ID = 2741]

1. Supply of conventional power is not reliable. [Option ID = 10961]
2. Even when people are connected to the electricity grid, they face frequent disruptions. [Option ID = 10962]
3. Presently, solar power supply is variable and intermittent. [Option ID = 10963]
4. Solar power may soon be a dominant player in the energy supply market. [Option ID = 10964]

Correct Answer :-
- Presently, solar power supply is variable and intermittent. [Option ID = 10963]

19) The distance between the planes

$$\vec{r}.(\vec{i} + 2\vec{j} - 2\vec{k}) + 5 = 0$$

and

$$\vec{r}.(\vec{i} + 2\vec{j} - 2\vec{k}) - 8 = 0 \qquad \text{is:}$$

[Question ID = 2738]

1. 13 [Option ID = 10951]
2. 3 [Option ID = 10950]
3. $\dfrac{13}{3}$ [Option ID = 10952]
4. 1 [Option ID = 10949]

Correct Answer :-
- $\dfrac{13}{3}$ [Option ID = 10952]

20)

Consider the following two functions. The time complexities of the two functions are

```
func1(int n)
{
    if(n <= 1) return 1;
else return 2*func1(n − 1);
    }

func2(int n)
{
    if(n <= 1) return 1;
else return func2(n − 1) + func2(n − 1);
    }
```

[Question ID = 2757]

1. $\theta(n)$ for *func1* and $\theta(2^n)$ for *func2*. [Option ID = 11026]
2. $\theta(n)$ for both *func1* and *func2*. [Option ID = 11028]
3. $\theta(n)$ for *func2* and $\theta(2^n)$ for *func1* [Option ID = 11027]
4. $\theta(2^n)$ for both *func1* and *func2*. [Option ID = 11025]

Correct Answer :-

$\theta(n)$ for *func1* and $\theta(2^n)$ for *func2*. [Option ID = 11026]

21) The value of b such that the scalar product of the vector $\vec{i} + \vec{j} + \vec{k}$ with the unit vector parallel to the sum of the vectors $2\vec{i} + 4\vec{j} - 5\vec{k}$ and $b\vec{i} + 2\vec{j} + 3\vec{k}$ equals one is

[Question ID = 2739]

1. **1** [Option ID = 10956]
2. **-2** [Option ID = 10953]
3. **0** [Option ID = 10955]
4. **-1** [Option ID = 10954]

Correct Answer :-

1 [Option ID = 10956]

22) The point $(2, 1)$ to the curve $(x - 2)^2 = y(y - 1)^2$ is

[Question ID = 2728]

1. a cusp [Option ID = 10910]
2. not even a double point [Option ID = 10912]
3. a conjugate point [Option ID = 10911]
4. a node [Option ID = 10909]

Correct Answer :-

a node [Option ID = 10909]

23) Let $V = M_{3 \times 3}(\mathbb{R})$ and let $T : V \to V$ be defined by $T(A) = A + A^t$ where A^t denotes the transpose of A. Number of distinct real eigen values of T is

[Question ID = 2731]

1. 0 [Option ID = 10921]

2. 3 [Option ID = 10924]

3. 2 [Option ID = 10923]

4. 1 [Option ID = 10922]

Correct Answer :-

• 2 [Option ID = 10923]

---

24) Suppose bool is a Boolean variable that can assume value 0 or 1. Then, the following code is equivalent to which of the given statements?

```
If (bool == 0)
    bool = 1;
else
    bool = 0;
```

[Question ID = 2763]

1. Bool = 1 + bool [Option ID = 11049]
2. 1 – bool [Option ID = 11052]
3. 1 % bool [Option ID = 11050]
4. bool – 1 [Option ID = 11051]

Correct Answer :-

---

25) Let $f(x) = \sin^2\left(\frac{\pi x}{2}\right)$, then $\lim_{n \to \infty} \frac{1}{n}\sum_{k=1}^{2n} f\left(\frac{2}{n}\right)$ is equal to

[Question ID = 2726]

1. $\frac{1}{2}$ [Option ID = 10901]

2. 1 [Option ID = 10903]

3. $\frac{3}{4\pi}$ [Option ID = 10902]

4. $\frac{5}{2\pi}$ [Option ID = 10904]

Correct Answer :-

• 1 [Option ID = 10903]

---

26) The minimum number of comparisons required to determine if a given integer x appears more than $n/2$ times in a *sorted* array of n integers is

[Question ID = 2755]

1. $\theta(1)$ [Option ID = 11017]
2. $\theta(n \log n)$ [Option ID = 11020]
3. $\theta(\log n)$ [Option ID = 11018]
4. $\theta(n)$ [Option ID = 11019]

Correct Answer :-

• $\theta(\log n)$ [Option ID = 11018]

---

27)

Consider a hash table of size seven, with starting index zero, which uses a hash function $(2x + 5)\, mod\; 7$ with *open addressing* and collisions resolved using *linear probing*. After inserting a set of values into the table, suppose the current content of the hash table at respective locations (starting from zero) is

14, 11, e, e, 10, 21, 4

where e denotes an empty location.
What can be a possible order in which the entries are inserted into the hash table?

[Question ID = 2751]

1. 11, 4, 14, 21, 10 [Option ID = 11004]
2. 4, 21, 14, 11, 10 [Option ID = 11001]
3. 4, 21, 11, 14, 10 [Option ID = 11002]
4. 4, 11, 21, 14, 10 [Option ID = 11003]

Correct Answer :-

• 4, 21, 14, 11, 10 [Option ID = 11001]

28) If $f(x) = \tan x$, then $f^{27}(0) - \binom{27}{2}f^{25}(0) + \binom{27}{4}f^{23}(0) - \cdots - \binom{27}{26}f'(0)$ equals

[Question ID = 2725]

1. **0** [Option ID = 10898]
2. **-1** [Option ID = 10900]
3. **1** [Option ID = 10899]
4. **13!** [Option ID = 10897]

Correct Answer :-

• **-1** [Option ID = 10900]

29) The area enclosed by the curves $x^2 + y^2 = 1$ and $(x-1)^2 + y^2 = 1$, is

[Question ID = 2727]

1. $2\int_0^{\sqrt{3}/2} \sqrt{1-t^2}\; dt$ [Option ID = 10907]

2. $2\int_0^{\sqrt{3}/2} \sqrt{1-t^2}\; dt - \frac{\sqrt{3}}{2}$ [Option ID = 10908]

3. $\frac{\sqrt{3}}{2} + \pi$ [Option ID = 10906]

4. $\frac{\sqrt{3}}{2} + \frac{\pi}{2}$ [Option ID = 10905]

Correct Answer :-

• $2\int_0^{\sqrt{3}/2} \sqrt{1-t^2}\; dt - \frac{\sqrt{3}}{2}$ [Option ID = 10908]

30) Given an array of n *distinct* integers not necessarily sorted, let $T(n)$ denote the time taken for the most efficient algorithm to find an element of the array which is neither the minimum nor the maximum. Which of the following statements is true?

[Question ID = 2756]

1. $T(n) = \theta(n \log n)$ [Option ID = 11024]
2. $T(n) = \theta(1)$ [Option ID = 11021]

3. $T(n) = \theta(n)$ [Option ID = 11023]
4. $T(n) = \theta(\log n)$ [Option ID = 11022]

Correct Answer :-

. $T(n) = \theta(1)$ [Option ID = 11021]

---

31) The value of λ, for which the vectors $(1, 2, 1)$, $(2, \lambda, 4)$, $(4, 5, 6)$ over the field of real numbers are linearly dependent, is

[Question ID = 2729]

1. 4 [Option ID = 10913]
2. 1 [Option ID = 10916]
3. 3 [Option ID = 10914]
4. 2 [Option ID = 10915]

Correct Answer :-

. 1 [Option ID = 10916]

---

32) Let A be 3 x 3 real matrix such that $\det(A^2 + 4A + 5I_3) = 0$ and $\det(A + 4I_3) = 0$ then A^{-1} is given by

[Question ID = 2733]

1. None of these [Option ID = 10932]
2. $-\frac{1}{20}(A^2 + 8A + 21I_3)$ [Option ID = 10931]
3. $-\frac{1}{5}(A + 4I_3)$ [Option ID = 10930]
4. $-\frac{1}{4}I_3$ [Option ID = 10929]

Correct Answer :-

. $-\frac{1}{20}(A^2 + 8A + 21I_3)$ [Option ID = 10931]

---

33) Let $Z_p = \{0, 1, 2, \dots, p-1\}$ where p is prime. Consider the function $f: Z_7 \to Z_7$ given by $f(x) = 3x \pmod 7$
Then

[Question ID = 2761]

1. f is neither one-one nor onto. [Option ID = 11043]
2. f is both one-one and onto. [Option ID = 11044]
3. f is onto but not one-one. [Option ID = 11042]
4. f is one-one but not onto. [Option ID = 11041]

Correct Answer :-

• f is both one-one and onto. [Option ID = 11044]

---

34)

What is the output printed by the following code

```
int main()
{
    int i,j;
    float result = 10000;
    for (i = 1; i <= 3; i++)
        for (j = 4; j > 1; j = j/2);
            result = result/j;

    cout<< result;
}
```

[Question ID = 2762]

1. infinity [Option ID = 11048]
2. 13 [Option ID = 11046]
3. 10000 [Option ID = 11047]
4. 13.28 [Option ID = 11045]

Correct Answer :-

- 10000 [Option ID = 11047]

35) Which of the following is incorrect for the following system of equations
$$x + y + z = 2$$
$$2x + y - z = 3$$
$$3x + 2y + kz = 4$$
The system possesses unique solution if

[Question ID = 2732]

1. $3 < k < 4$ [Option ID = 10928]
2. $-1 < k < 1$ [Option ID = 10925]
3. $2 < k < 3$ [Option ID = 10927]
4. $1 < k < 2$ [Option ID = 10926]

Correct Answer :-

. $-1 < k < 1$ [Option ID = 10925]

36) A man speaks truth 3 out of 4 times. He throws a fair cubical die and reports that it is a 4, then the probability that it is actually a 4 is

[Question ID = 2735]

1. $\frac{1}{4}$ [Option ID = 10939]
2. $\frac{1}{8}$ [Option ID = 10940]
3. $\frac{3}{4}$ [Option ID = 10937]
4. $\frac{3}{8}$ [Option ID = 10938]

Correct Answer :-

. $\frac{3}{8}$ [Option ID = 10938]

37)

What is the output of the following C++ code segment?

```
class base {
    public:
            virtual void fn() { cout << " Hello"; }
};

class derived : public base {
    public:
            virtual void fn() { cout << " Hi";  }
};

int main() {
    base *bp[2];
    bp[0] = new base();

    bp[1] = new derived();
    for (int i = 0; i < 2; i++)
            bp[i] -> fn();
    return 0;
}
```

[Question ID = 2764]

1. Hello Hi [Option ID = 11053]
2. Hello Hello [Option ID = 11054]
3. Hi Hello [Option ID = 11055]
4. Hi Hi [Option ID = 11056]

Correct Answer :-

• Hello Hi [Option ID = 11053]

38) The contents of urns I, II, III are as follows
    Urn I: 1 white, 2 black and 3 red balls
    Urn II: 2 white, 1 black and 1 red ball
    Urn III: 4 white, 5 black and 3 red balls
One urn is chosen at random and two balls drawn. They happen to be one
white and one red. The probability that they come from urn III is

[Question ID = 2734]

1. $\dfrac{33}{118}$ [Option ID = 10934]

2. $\dfrac{55}{118}$ [Option ID = 10935]

3. $\dfrac{15}{59}$ [Option ID = 10933]

4. $\dfrac{2}{11}$ [Option ID = 10936]

Correct Answer :-

• $\dfrac{15}{59}$ [Option ID = 10933]

39) While adding three 1-bit numbers, X, Y, and Z, which of these is the correct expression for the carry? (. stands for logical AND, and + stands for logical OR, and ⊕ stands for XOR)

[Question ID = 2767]

1. $X \oplus Y \oplus Z$ [Option ID = 11067]
2. $X.Y + X.Z + Y.Z$ [Option ID = 11066]
3. $X.Y.Z$ [Option ID = 11068]
4. $X + Y + Z$ [Option ID = 11065]

Correct Answer :-

. $X.Y + X.Z + Y.Z$ [Option ID = 11066]

40) The equation $x^3 - 3x + 1 = 0$ possesses

[Question ID = 2736]

1. exactly two roots between 0 and 1. [Option ID = 10942]

2. all the three roots between 0 and 1. [Option ID = 10941]

3. exactly one root between 0 and 1. [Option ID = 10943]

4. No root between 0 and 1. [Option ID = 10944]

Correct Answer :-

. exactly one root between 0 and 1. [Option ID = 10943]

41) What is the output of the following C++ code segment (assuming that the space occupied by an int variable is 2 and a pointer variable is 4)?

```
int a[] = {43, 56, 12, 61, 39}, *ap = a;

cout << (ap[4] - ap[1]) << " " << (&ap[4] - &ap[1]) << " " << (*(ap +
4) - *(ap + 1));
```

[Question ID = 2765]

1. 5 3 5 [Option ID = 11058]
2. -17 6 -17 [Option ID = 11059]
3. -17 3 -17 [Option ID = 11060]
4. 5 6 5 [Option ID = 11057]

Correct Answer :-

• -17 3 -17 [Option ID = 11060]

42)

Consider the following C-like pseudocode which operates on a linked list

```
struct element{
    int data;
    struct element *leftchild;
    struct element *rightchild;
}
int func(struct element *ptr){
    int value = 0;
    if (ptr!=NULL){
        if(ptr→leftchild != NULL){
            value=1 + func(ptr→leftchild);
        }
        if(ptr→rightchild != NULL){
            value = max(value, 1 + func(ptr→rightchild));
        }
    }
    return value;
}
```

The value returned by *func* when a pointer to the root of a non-empty tree is passed as argument is

[Question ID = 2752]

1. the number of leaf nodes in the tree. [Option ID = 11008]
2. the number of total nodes in the tree. [Option ID = 11006]
3. the number of internal nodes in the tree. [Option ID = 11007]
4. the height of the tree (height is one plus the maximum distance of any leaf node from the root) [Option ID = 11005]

Correct Answer :-

• the height of the tree (height is one plus the maximum distance of any leaf node from the root) [Option ID = 11005]

43)

III. In the context of Project Tiger, many observers have noted that the country is now home to approximately two-thirds of the tigers in the world. But many have sounded a note of caution and said a lot more effort is required before we can declare tiger populations to be robust over the long term in India. These efforts usually mean increasing vigilance against poaching of tigers and their prey, expanding existing tiger reserves.

However, there is an opposing group of public intellectuals that considers social justice to be of paramount importance in India. In their estimation, forests are as much cultural and social places as they are a habitat for wildlife. Forests are home to one in eight Indians, and tiger conservation has come at a terrible human cost; tribals have been forced out of forests, uprooted from their social and cultural context, deprived of education, development and livelihoods, plunged into poverty, and remained either unwilling or unable to integrate into the mainstream. Conservation of the tiger, they say, should not be at the cost of the fundamental rights of our citizenry.

In the last two decades or so, elected governments in India have sanctioned the cutting down of forests to build highways, flattened forests for coal and other minerals, and drowned out forests for dams, significantly devastating wildlife and forest dwellers alike. These sanctions are accompanied by statements of reassurance that it is possible to balance economic development with ecological and social concerns. Notwithstanding these platitudes, both conservationists and social justice activists feel short-changed by a government set on accelerating swiftly towards the edge of ecological destruction.

The great game playing out in the forests of our country continues. The tiger, forests, and forest dwellers will remain pawns in this great game. It remains to be seen if conservationists and social justice activists can reconcile their differences to collaboratively call out the conductor before it is curtains.

What does the statement 'The tiger, forests, and forest dwellers will remain pawns in this great game' imply? [Question ID = 2748]

1. All of these [Option ID = 10992]
2. The two groups are hurting each other's interests. [Option ID = 10989]
3. Wild animals, forest dwellers and ecology are the sufferers in the quarrel between the two groups. [Option ID = 10991]
4. The government is exploiting the differences between the two groups to further its agenda. [Option ID = 10990]

Correct Answer :-

• All of these [Option ID = 10992]

44)

III. In the context of Project Tiger, many observers have noted that the country is now home to approximately two-thirds of the tigers in the world. But many have sounded a note of caution and said a lot more effort is required before we can declare tiger populations to be robust over the long term in India. These efforts usually mean increasing vigilance against poaching of tigers and their prey, expanding existing tiger reserves.

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What is the stand of 'an opposing group of public intellectuals' on conservation of tigers? [Question ID = 2746]

1. All of these [Option ID = 10984]
2. Tiger conservation has come at a terrible human cost. [Option ID = 10983]
3. There are enough of tigers in the country and no further efforts need be made to protect them. [Option ID = 10982]
4. Rights of tribals should get primacy. [Option ID = 10981]

Correct Answer :-

• All of these [Option ID = 10984]

45)

III. In the context of Project Tiger, many observers have noted that the country is now home to approximately two-thirds of the tigers in the world. But many have sounded a note of caution and said a lot more effort is required before we can declare tiger populations to be robust over the long term in India. These efforts usually mean increasing vigilance against poaching of tigers and their prey, expanding existing tiger reserves.

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Why do both conservationists and social justice activists feel cheated? [Question ID = 2747]

1. Development projects have not cared for the rights of tribals living in forests. [Option ID = 10986]
2. Government policies have devastated wildlife and forest dwellers alike. [Option ID = 10987]
3. Government policies have ignored the need for tiger conservation. [Option ID = 10985]
4. They fail to understand whose interests the government is guarding. [Option ID = 10988]

Correct Answer :-

• Government policies have devastated wildlife and forest dwellers alike. [Option ID = 10987]

46)

III. In the context of Project Tiger, many observers have noted that the country is now home to approximately two-thirds of the tigers in the world. But many have sounded a note of caution and said a lot more effort is required before we can declare tiger populations to be robust over the long term in India. These efforts usually mean increasing vigilance against poaching of tigers and their prey, expanding existing tiger reserves.

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Mark the statement that is NOT true [Question ID = 2749]

1. Conservationists and social justice activists need to come together to fight the government before it is too late. [Option ID = 10996]
2. The Government has declared its intention to pursue economic development even at the cost of ecology. [Option ID = 10995]
3. India has the largest number of tigers in the world. [Option ID = 10993]
4. According to one group, both wildlife and tribal dwellers have equal right over forests. [Option ID = 10994]

Correct Answer :-
• The Government has declared its intention to pursue economic development even at the cost of ecology. [Option ID = 10995]

47) Consider a weighted graph where every edge has weight exceeding w. Suppose we determine the shortest path from a source s to a destination t in the graph. Consider the following statements.

I. If we decrease the weight of every edge in the graph by w, the shortest path between s and t does not change.
II. If we multiply the weight of every edge in the graph by some positive quantity c, the shortest path between s and t does not change.
Then [Question ID = 2758]

1. Statement I is false but statement II is true. [Option ID = 11030]
2. Statement I is true but statement II is false. [Option ID = 11029]
3. Both the statements are true. [Option ID = 11031]
4. Both the statements are false. [Option ID = 11032]

Correct Answer :-
• Statement I is false but statement II is true. [Option ID = 11030]

48) Which of these is a disadvantage of DRAM memory? [Question ID = 2766]

1. It requires periodic refreshing. [Option ID = 11063]
2. None of these [Option ID = 11064]
3. It is made of silicon. [Option ID = 11062]

4. Memory is stored off-chip. [Option ID = 11061]

Correct Answer :-

- It requires periodic refreshing. [Option ID = 11063]

49) **An Ethernet frame is 32 bytes long. How many extra bytes should be added to the frame before transmission?** [Question ID = 2771]

1. 32 bytes [Option ID = 11082]
2. 48 bytes [Option ID = 11083]
3. 64 bytes [Option ID = 11084]
4. 16 bytes [Option ID = 11081]

Correct Answer :-

- 32 bytes [Option ID = 11082]

50) **The number of 4 digit *even* numbers where all the digits are distinct is (Note that the most significant digit of these numbers cannot be zero).**

[Question ID = 2760]

1. 2296 [Option ID = 11040]
2. 2240 [Option ID = 11039]
3. 2520 [Option ID = 11037]
4. 2620 [Option ID = 11038]

Correct Answer :-

- 2296 [Option ID = 11040]