

## **Pattern update:**

Here is the confirmed pattern of the TCS NQT, as per information from test-takers.

**English** - 15 Qs in 10 minutes - Cloze passage, vocabulary-based questions on passages, inferential based questions on passages

**Quantitative Aptitude** - 15 Qs in 30 minutes

**Advanced Programming Logic** - 10 Qs in 20 minutes – Questions from C, C++, Java

**Coding** - 1 Q in 30 minutes – Choice of languages are C, C++, Java, Python and PERL

1. No advanced sub-sections
2. On-screen calculator available
3. Negative marking applicable for MCQ questions
4. FUB (Fill up the blank) questions were also present

## **English**

### **SLOT 4 –**

#### **1. Cloze passage source:**

Managing digital transformation to realize successful outcomes is not easy. The secret to success lies in carefully treading the tight rope between technology upgrade and changes in the operating model. Too much focus on technology and too little on the operating model will, after initial success, land the enterprise in the middle of a digital dip. Such a digital dip is typically caused by siloed approach, confusion over KPIs, conflicting stakeholder views, and poor user adoption. Operating model changes without adequate technology upgrade will constrain the efficiency of the enterprise.

Remember that digital success across the breadth and depth of the enterprise is the real objective. It is much easier to succeed with smaller projects. For lasting results, technology transformation must be driven by a comprehensive IT and operations framework that leverages agility, analytics, automation, and cloud.

2. Fill up the blanks:

Last week I went to Mumbai. The Airport security officer wanted me to take **out** every single object from my suitcase. I was in a hurry my connecting flight was scheduled to take **off** in 15 minutes. I was visiting Mr. Kapadia. He had been living in Mumbai **since** 1985 and I had been living in Chennai **for** thirty years. It was my practice to visit him every year on his birthday.

3. To create \_\_\_\_\_ operation, TCS Machine First<sup>TM</sup> delivery model is \_\_\_\_\_.

- a. intelligensia/essentially
- b. intelligently/inessential
- c. intelligent/essential
- d. negligent/eventual

Answer: intelligent/ essential

SLOT 3 –

1. Fill up with the right prepositions:

On the last day of the financial year, he directed his company bankrupt. Now, the company was taken over by the government. His father also did the same with a sister concern. He takes after his father. The government is looking to appoint a CEO for the company. The best candidate should be appointed for the government is looking to appoint a CEO for the company. The best candidate should be appointed with the post. Mr. Ram has an appointment with the finance master. He has good chances of being selected.

2. Cloze passage source:

TCS leader Ashok Pal wrote in his blog: "Most enterprises that try digital transformation achieve only partial success. Why? Because digital business transformation is far more than a technology upgrade. For an enterprise to scale digitally, it must transform its operating model with the help of technology. Changing an enterprise's operating model is challenging but the rewards are commensurate. How to Succeed Digitally? Managing digital transformation to realize successful outcomes is not easy. The secret to success lies in carefully treading the tight rope between technology upgrade and changes in the operating model."

3. One way to enable intelligent operations is by using automation to take over \_\_\_\_\_ manual tasks and processes.

- A. routine
- B. creative
- C. dangerous
- D. Difficult

**Answer:** Routine

## SLOT 2 –

### 1. Fill in the blanks with the appropriate prepositions – (Answers in bold)

After I met with an accident, I was looked **after** my uncle. I gave a complaint to the police and they said they will look **into** it. While convalescing I read Oliver Twist. This book runs **upto** two hundred pages. I also attended a program on yoga. The program ran **for** three hours.

### 2. Cloze passage –

TCS' Journal of Innovation and Transformation (JIT) is our **flagship** Thought Leadership **artifact** where in **seasoned** industry practioners from TCS bring powerful insights and open up the windows for a wave of creative ideas in the new world of manufacturing. In the previous editions of JIT, we have focused on key themes such as customer experience, digital disruptions, digital forces in automotive industry etc.

The theme of the latest edition is "New Product Innovation in the Digital World" through which we explore how digitization has **revolutionized** new product development process, from product design and development to product improvement. A key highlight for this edition is a special article titled '**Weaving** the future with Digital thread' – a TCS collaboration with our esteemed partner - CIMdata.

### 3. Fill in the blank with the right option.

One way to enable intelligent operations is to extract \_\_\_\_\_ insights from data generated by automated processes.

- a. Assignable
- b. Achievable
- c. Actable
- d. Actionable

**Answer:** Actionable

## SLOT 1 –



PASSAGE: In the game of cricket, any side with a pair of bowlers of complementing superior qualities prove invincible. The current generation would know Bhuvii, Bumrah or Starc-Cummins pairs better than their own parents. So, let me dissect a pair that ruled the cricketing world during the fifties and early sixties. Brian Statham and Fred Trueman of England proved to be a lethal combination that every batsman wanted to avoid playing. Statham was a bowler of immaculate accuracy, nailing length and lyrical run-up. Oxymoronically, his virtues were the basis for his misfortunes. Knowing that he would bowl in a manner that's unplayable, batsmen were more smug in defending his balls than when playing an erratic bowler.

Trueman nicknamed as Fiery had a long delivery stride and made no bones about his intentions to test batsman's physical and mental strength. The ball would flash past the bat in moments of incredibility with the batsman thanking his Maker, if the ball missed his limbs and occasionally the stumps.

1. Which one of the following sentences has an appropriate bold part that can be replaced with lethal?
  - a. The series of never-ending bubbles rejoiced the children to any end
  - b. The never-say-die team won the tournament for the tenth time.
  - c. "Mount vesuvius" eruption proved to be completely ruinous to pompeii
  - d. The life-saving drug administered to the patient brought him back to his elements

Answer: C

2. Any team with two bowlers sharing the required traits is:

- a. Arrogant to its opponents
- b. vulnerable to choke
- c. hard to defeat
- d. insignificant in its contribution.

Answer: C

3. Oxymoron is a special language device, where

- a. A tough idea is simplified by bringing a simple parallel to it
- b. Two contrasting elements are placed side by side reinforcing an idea
- c. A brilliant object issued in place of a dull entrance
- d. An abstract entity is compared to an exact entity emphasising similarity/difference

Answer: B

Cloze passage:

Digital twin in automotive industry presents an opportunity to pair virtual and physical worlds leveraging different technologies such as IoT, big data analytics, and simulation techniques to re-engineer critical processes as below.

Vehicle development: Integrates data across the product lifecycle to enable data-driven vehicle concept, informed design through rapid assessment of change impacts and early detection of issues, and accurate and accelerated design verification.

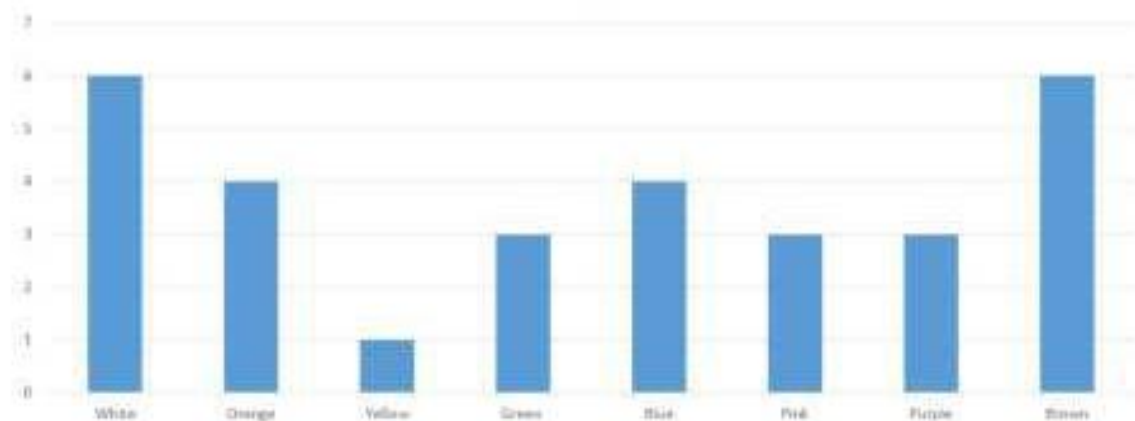
Vehicle manufacturing: Factory's digital twin in manufacturing enables real time data gathering from machine sensors, facilitating flexible cell manufacturing, IoT-driven maintenance strategies, and leveraging beacon data to ensure workers' safety.

Vehicle sales and service: Captures real-time field insights on driver preferences, product features' uptake, vehicle performance, and service history to create an interactive user experience on the sales floor and enable proactive and predictive after-sales service.

### **Quantitative Aptitude –**

#### **SLOT 4 –**

1. Anmol picks sweets from a bag without looking. The distribution of sweets of each colour in the bag is shown below. What is the probability that anmol will pick a white sweet?



Answer: 0.2

2. Using principle of moments, one can weigh any item using a single weighing stone. In one such experiment, a food packet was kept hanging at a distance of 15 cm to the left of a rod's center. It was countered by a 50 gm weighing stone, kept at a distance of 45cm to the right of the center. What's the weight of food packet?

Write your answer as a numeral without any unit, space or any other character anywhere.

Answer: 150 gm

3. Some scientists interpret satellite data to mean that glaciers are melting faster than in earlier centuries. In each decade since the industrial revolution, the amount of glacier melt has doubled and some scientists predict that all the glaciers will have melted away by the year 2037. If indeed this were true, in which year, would we have lost 50% of all the glaciers?

Answer: 2027

4. A very crowded street in T.Nagar contains 100 buildings. The buildings are numbered from 1 to 100. How many 9's are used by the Chennai Corporation in numbering these buildings?

- A. 21
- B. 19
- C. 20
- D. 9

Answer: 20

5. An equilateral triangle ABD is inscribed in a circle as shown in the figure. AC is a diameter of the circle. If the radius of the circle is 10 cm, what is the area of the shaded portion?

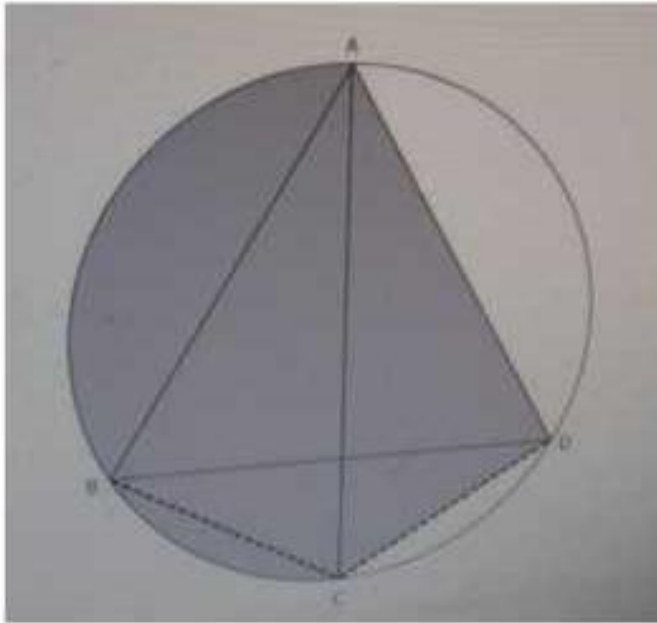
(diag.)

- a. 243.7 sq.cm
- b. 192.4 sq.cm
- c. 221.4 sq.cm
- d. 273.1 sq.cm

6. I have a two-digit number. The unit's digit is twice as ten's digit. If I reverse the number and subtract 36 from it, I get the initial number. What's the number started with?

Please write your answer as a numeral, without any leading or trailing space.

Answer: 48

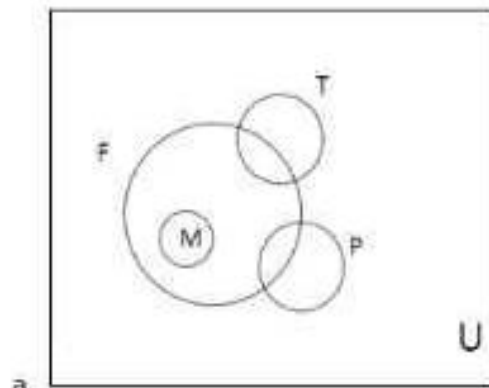


Answer: 243.7 sq.cm

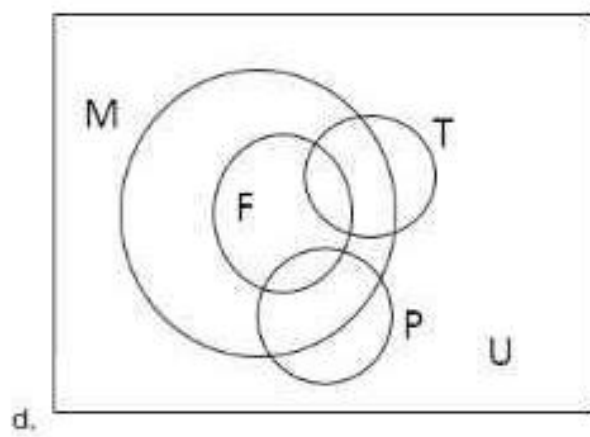
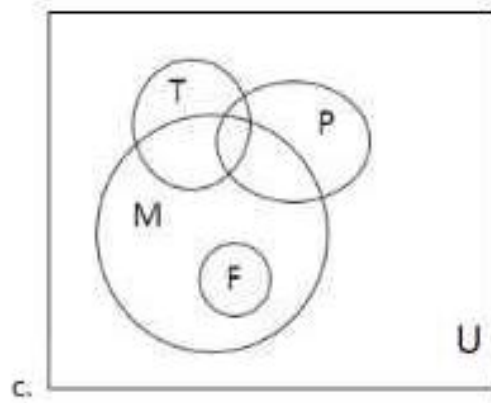
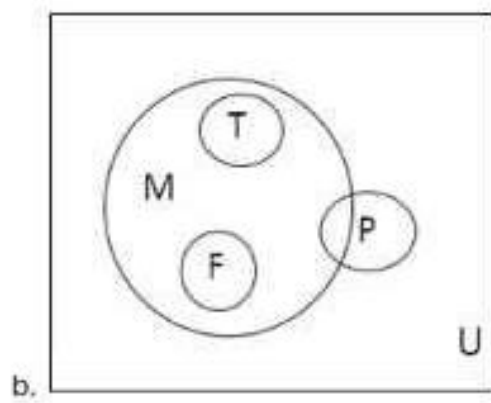
7. The statement:

"All fathers are men some are teachers or politicians but no teacher is a politician"

Can be represented in Venn diagram as (M - Men, F - Father, T = Teacher, P - Politician) which of the following options?







Answer: D

8.

$n$	$f(n)$
8	3
32	5



128	7
512	9

From the above table, the function  $f(n)$  is:

- a.  $n \log_2(n)$
- b.  $\log_2(n)$
- c.  $\exp(n)$
- d.  $2n$

**Answer:**  $\log_2(n)$

9. Mary Meeker in her annual internet Trends Report said that Americans are spending even more time digital media. "6.3 hours a day in 2018, up 5 percent from the year before." How much time did Americans spend with digital media in 2017?

- a. 5 hours and 53 minutes
- b. 6 hours
- c. 6 hours and 10 minutes
- d. 5 hours

**Answer:** 6 hours

10. Two alloys A and B are both made of iron and zinc. The ratios of iron to zinc in the two alloys are 5:3 and 1:2 respectively. A and B are combined in the ratio 4:3 to yield a new alloy C. What is the ratio of iron and zinc in C?

- a. 4:3
- b. 2:3
- c. 1:1
- d. 5:2

**Answer:** 1:1

### SLOT 3 –

1. If  $f(x) = x^2$ , what is the shape of  $f(x)$ ?

- a. Quadrilateral
- b. S-shaped
- c. Parabolic
- d. Circular

**Answer:** Parabolic

2. A race horse starts chasing a wild pony 2 hours after the pony bolts the stable. The race horse finally catches up with the pony after 3 hours. If the average

d. An abstract entity is compared to an exact entity emphasising similarity/difference

Answer: B

Cloze passage:

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**Quantitative Aptitude –**

**SLOT 3 –**

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- a. Quadrilateral
- b. S-shaped
- c. Parabolic
- d. Circular

Answer: Parabolic

2. A race horse starts chasing a wild pony 2 hours after the pony bolts the stable. The race horse finally catches up with the pony after 3 hours. If the average speed of the race horse is 49 kmph, then the average speed of the wild pony is \_\_\_\_\_ kmph.

- a. 29.4
- b. 30.4
- c. 19.6

d. 32.67  
Answer: 29.4

3. Twin brothers Lava and Kusha wrote the TCS NQT test. While Lava scored 45% and got 4 marks below the cut off, Kusha scored 60% and got 8 marks above cut-off and got selected for interview. What was the maximum marks in the test?

Answer: 80

4. We live and work in a time of rapidly advancing technology. A social media start up is doubling the number of users each weeks. It took just 47 weeks to acquire a million users. How long did it take to acquire half a-million users?

Answer: 46

5. The kids Phalaa and Adhiphalaa (don't confuse with Balaa and Adhibalaa, the abracadabra that sage Vishwamitra taught to Raama and Lakshmana to successfully stay the demoness Taadaka) carry some fruits. Being tender and small, each could carry only a single digit number of fruits. Adhiphalaa has three times the fruits that Phalaa has. If the digits corresponding to Phalaa's and Adhiphalaa's fruits are written in that order, the resulting two digit number is a multiple of three. How many fruits does Adhiphalaa have?

Answer: 39

6. Rajesh has Rs. 850 in his purse made up entirely of notes of Rs. 50 denomination. His wife Latha, on the other hand, has only notes of Rs. 20 denomination in her purse and they amount to Rs. 460. Rajesh and Latha redistribute the notes between the two purses so that if one were to choose one of the two purses at random and then randomly draw a note from it, the probability of the note being of Rs. 50 denomination is maximized. After this redistribution, there will be a total of Rs. \_\_\_\_\_ in the purse with the larger amount of money.

Answer: 700

7. Sura, a strongly distilled alcoholic drink was used in ancient India as an anaesthetic by surgeons. A 15 litres cask initially contains pure Sura up to the brim. The Sura is diluted by removing 5 litres and replacing that quantity with water. If Sura is diluted twice, what is the ration of Sura to water in the cask?

- a. 2:1
- b. 1:1
- c. 1:2
- d. 4:5

Answer: 4:5



8. The speed of a common snail is about 1 mm per second. It secretes a bit of mucus that coats the ground beneath and helps it to move along. This snail we are interested in now has a problem with this secretion and so it moves one mm in the first second and in the subsequent seconds it moves only half the distance covered in the prev second. Algae, the good it cherishes, is at 3 mm distance from this snail. In how much time it will reach its food.
- a. It will never reach its food
  - b. 2.5 seconds
  - c. 2.7685 seconds
  - d. 3 seconds

Answer: It will never reach it food

9. The muzzle velocity of a bullet in 5.56 INSAS rifle (Indian version of AK47) is 882 meters/sec. A sergeant holds this rifle facing the sky and shoots a bullet. What's the bullet's maximum reachable altitude? Assume  $g = 9.8 \text{ m/sec/sec}$ . Write your answer as numeral without any other character.

Hint:  $v^2 = u^2 + 2gs$

Answer: 39690

10. Ahilyanagari Express running at a speed of 60 kmph and Cholan Express at 120 kmph take 10 seconds to cross each other, when they are running in opposite directions (these two trains operate in the same route only as a mathematical fantasy and not in reality). If Cholan express is 120 metres longer than Ahilyanagari Express, what's the length in meters of the latter?

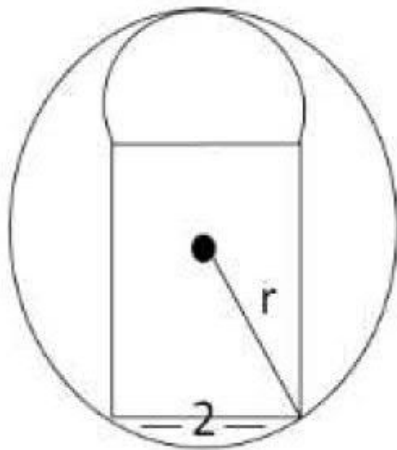
Answer: 190

11. A police car starts chasing a fugitive in a BMW 4 hours after the BMW escapes from the scene of crime at 10 AM. The BMW drives for 10 Km through crowded roads of Shanghai and then drives into a highway, where the traffic allows vehicles to move twice as fast. After a while, the police car finally catches up with the BMW after a chase that lasted 5 hours. By this time the moon was up in the sky for 4 hours. If the average speed of the police car is 50 kmph, then the average speed of the BMW is \_\_\_\_\_ kmph.

Answer: 27.79

12. A semicircle is drawn on one of the sides of the square with the side of the square as the diameter of the circle. If the length of the side of the square is 2 cm. What is the radius of the smallest circle that can contain this figure?





Write your answer in fractions.

Answer:  $17/8$

13. Bhaskar and Shakuntala challenge each other in math and are at loggerheads always. At the end of a milestone in their project, the team had a dinner and were seated in a circular table. If there were 16 people for dinner, what are the odds against the event that Bhaskar and Shakuntala will sit together (Give the answer as a:b)

Answer: 13:28

### SLOT 2 -

1. The expression  $3(x^2) - mx + 10$  leaves a remainder of -2 when divided by  $x - 3$ . What's the value of  $m$ ?

Answer: 13

2. 12 litres of water is poured into an aquarium of dimensions 50 cm length, 30 cm breadth and 40 cm height. By what height (in cm) will the water rise?

- a. 10
- b. 8
- c. 20
- d. 6

Answer: 8

3. Two finals are scheduled - The Wimbledon match and the World Cup Cricket at the same time. Anu wants to watch the Wimbledon finals and her brother Vinu wants to watch WCC final. They decide to roll a tetrahedral die twice. The tetrahedral is numbered 1, 2, 3, 4 on its four sides and all numbers are equally likely to appear. Anu rolls first and then Vinu rolls. If the number on the first roll is strictly

greater than the number on the second roll. Anu wins and gets to watch Wimbledon. What is the probability that Anu will get to watch Wimbledon?

- a.  $\frac{7}{16}$
- b.  $\frac{9}{16}$
- c.  $\frac{3}{8}$
- d.  $\frac{1}{2}$

Answer:  $\frac{3}{8}$

4. An electrical circuit has:

- A power source
- A resistor R and;
- Three parallelly connected resistors each of value 3R.

All these connected in series. If the current flowing through the circuit is five amperes, what will be its value, if R is doubled and each of 3R is halved?

Answer: 4 amps

5. Twin brothers Lava and Kusha wrote the TCS NQT test. While Lava scored 45% and got 4 marks below the cut off, Kusha scored 60% and got 8 marks above cut-off and got selected for interview. What was the maximum marks in the test?

Answer: 80

6. Ms Trikonapriya wants to decorate her abode's frontage with a triangular lawn. The two sides of this lawn are of five and six meters, subtending an angle of 30 degrees. If the lawn maintainer charges Rs.10 per square meter, how much would Trikonapriya pay to him for the entire lawn? Your answer should contain only the numeric value.

Answer: 75

7. Bhaskar wanted to send some documents to Shakuntala. He had her address without the 6-digit pin code. He didn't want to risk sending documents without pin code. So, he called Shakuntala. She did not give the pin code directly, she said, "The first four digits are 1910 in hexadecimal and the last four digits are 3177 in octal". Bhaskar could courier the documents now. What is her pin code?

Answer: 641663

8. If it takes 10 3D printers 10 minutes to print 10 models, how long will it take 100 printers to print 100 models?

Fill the correct answer in minutes. \_\_\_\_

Answer: 10minutes

9. Eighty cricket balls have been packed equally into two bags A and B. 20 of these balls have been signed by Kapil Dev - some of the signed balls are in bag A and the rest in bag B. One bag is selected and a ball is randomly picked from that. Given that the ball is signed, the probability that it is from Bag B is computed to be  $\frac{2}{3}$ . If bag A is twice more likely to be selected than Bag B, how many of the signed balls are in Bag B?

Answer: 16

10. In the normal course, Ravi, Sanjay and Mukund can each individually build a wall in 5, 8 and 10 days respectively. Due to difficult terrain and slushy conditions at the site, the individual time required for each to complete the work has increased by 20%, 25% and 50% respectively. How long will they take to build the wall if they work together?

- a. 3 days
- b. 4 days
- c. 6 days
- d. 2 and  $\frac{6}{17}$  days

Answer: 3 days

11. The difference between the ages of two of my three grandchildren is 3. My elder grandchild is three times older than the age of my youngest grandchild and my eldest grandchild's age is two years more than the ages of my two youngest grandchildren added together. How old is my eldest grandchild?

- a. 10
- b. 12
- c. 15
- d. 13

Answer: 15

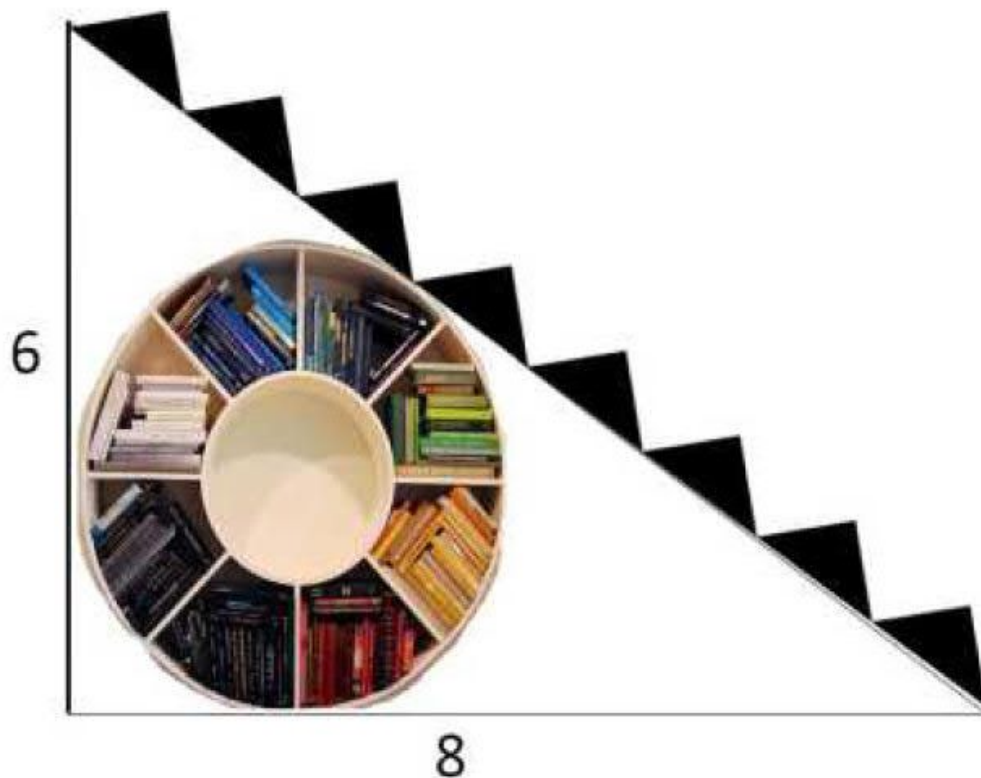
12. If company A sells a service for Rs. 50 per hour then which of the following could be a revenue function for company A?

- a.  $R(t) = 50 \cdot t$
- b.  $R(50) = 50 + t$
- c.  $R(t) = 50 + t \cdot t$
- d.  $R(t) = 50 + t$

Answer:  $50 \cdot t$

13. There is a circular bookshelf under a stair in a Govt. library. The wall is 6 ft. height, the distance of the base of the stairs from the corner of the room is 8ft. What is the radius of the circular bookshelf in feet?





- A. 1
- B. 3
- C. 2

Answer: 3

14. Your friend places 100 cards in a row, one of which contains the Jack of Clubs that you need to guess. You pick the card at position 15. The host removes all the cards except the card chosen by you at position 15 and another card at position 87. He now says, "One of these two cards is the Jack of Clubs". What is the probability that the card is at position 87?

- a. 0.01
- b. 0.5
- c. 0.98
- d. 0.99

Answer: 0.99

15. The difference between the ages of two of my three grandchildren is 3. My eldest grandchild is three times older than the age of my youngest grandchild, and my eldest grandchild's age is two years more than the ages of my two youngest grandchildren added together. How old is my eldest grandchild?

- a. 10
- b. 12

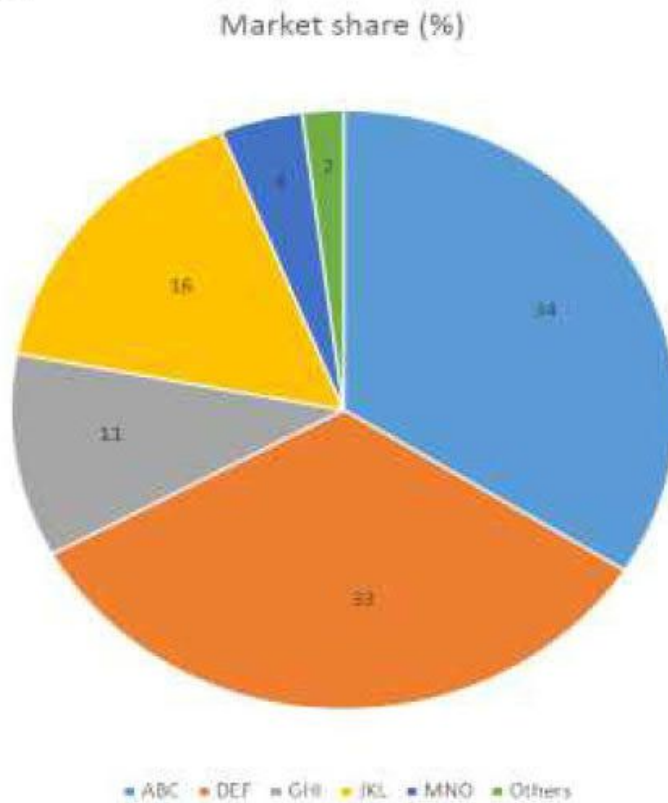


c. 15

d. 13

Answer: 15

16.



Here is a pi-chart showing the market share of a set of banks.

If the value of the market share of DEF is 6600 Cr, what is the market share of ABC and JKL together?

a. 15000 Cr

b. 8000 Cr

c. 10000 Cr

Answer: 10000 Cr

### SLOT 1-

1. In a country, 60% of the male citizen and 70% of the female citizen are eligible to vote. 70% of the male citizens eligible to vote voted, and 60% of female citizens eligible to vote voted. What fraction of the citizens voted during the election?

a. 0.49

b. 0.42

- c. 0.48
- d. 0.54

Answer: 0.42

2. A lady had some socks and hats in her closet - 17 blue, 47 red, and 24 yellow. The light are out and it is totally dark. In spite of the darkness, she can make out the difference between a hat and sock. She takes out an items out of the closet only if she is sure that it is a sock. How many socks must she take out to make sure she has two socks of each colour?

- a. 73
- b. 64
- c. 57
- d. 55

Answer: 73

3. In function  $P(x,y) = 85x - (50y + 150000)$ . What value indicates the increase in  $P$  that corresponds to increase in  $x$ , when  $y$  is kept a constant?

- a. 85
- b. 135
- c. 35
- d. 50

Answer: 85

4. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through.

- a. 155 degree
- b. 145 degree
- c. 160 degree
- d. 150 degree

Answer: 155 degree

5. Ram Speaks truth 40% of the time and Laxman speaks truth 60% of the time. Percentage of cases Ram and Laxman are likely to contradict each other in stating the same fact is\_\_\_\_\_.

Answer: 52%

6. Dimensional analysis plays an important and useful role in physics. Mass is denoted by  $M$ , length by  $L$  and time by  $T$ . So, momentum of a particle, which is a product of its mass and velocity has a dimension of  $MLT$  (velocity is distance/time

which is length/time). In a given physical education, the left hand side and right hand side must have the same dimensions.

Kinematic viscosity ( $k$ ) of a fluid is a measure of its resistive flow under gravity's influence. It's given by the equation,

$k = \eta / \rho$  where

$\eta$  is dynamic viscosity; its dimension is Force Time / Area

$\rho$  is density (mass/volume)

What's the dimension of kinematic viscosity?

- a.  $L^{-2}T^{-2}$
- b.  $L^{-2}T$
- c.  $LT^{-2}$
- d.  $L^2T^{-1}$

Answer:  $L^2T^{-1}$

7. In function  $P(x,y) = 85x - (50y + 150000)$ . What value indicates the increase in  $P$  that corresponds to an increase in  $x$ , when  $y$  is kept constant?

- a. 85
- b. 135
- c. 24
- d. 50

Answer: 85

8. Uma has 50 red and 50 blue balls. She has two bowls with her. She has to distribute the balls in these two bowls in such a way that none of the bowls are left empty. If one were to choose one of the two bowls at random and then randomly draw a ball from it, the probability of the ball being red is maximized. After this distribution, there will be a total of \_\_\_\_\_ balls in the bowl with a larger number of balls.

Answer: 99

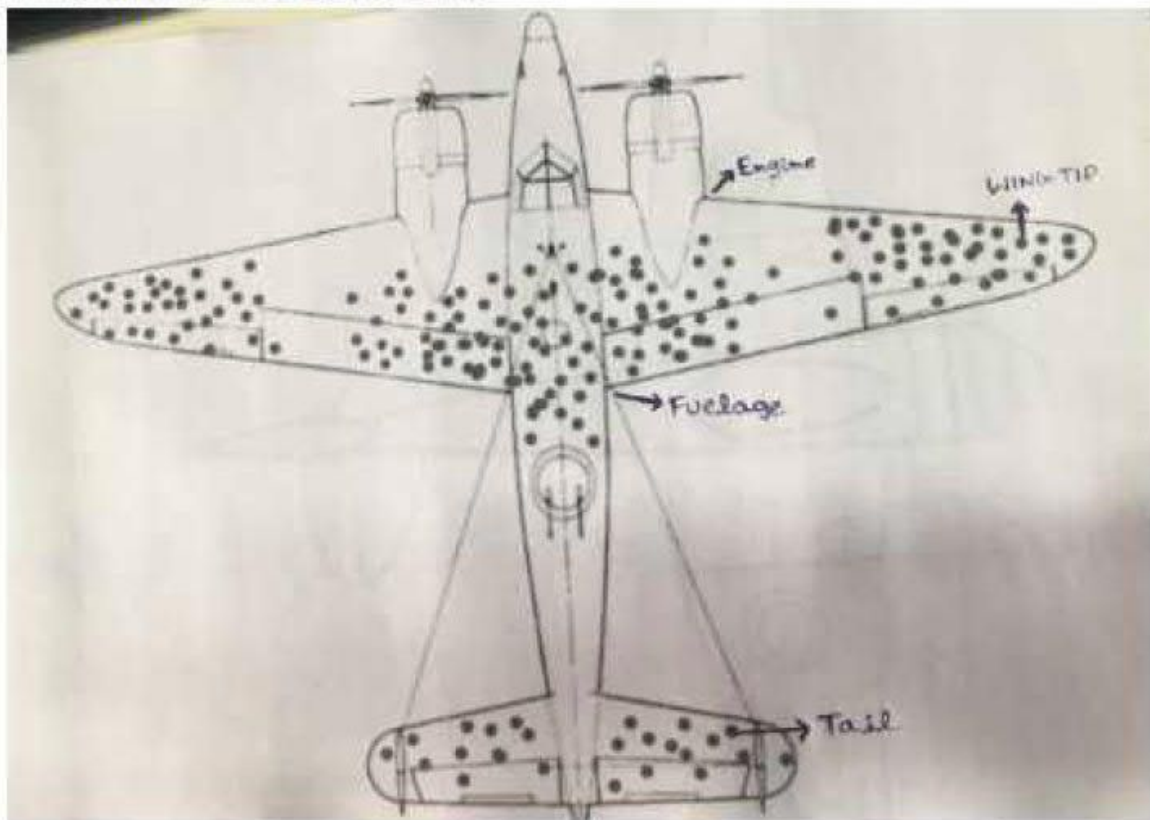
9. Bhaskar called his friend Shakuntala to celebrate his wedding anniversary. Shakuntala reached the street where he was living but forgot the door number. She called baskar for his door number. Being a geek in Maths he didn't give the door number directly. But told this " It is the middle number of the three numbers where the difference between first and second numbers is same as that between second and third. The product of first and last is 273 and sum of all three is 51." Shakuntala reached his house on time. His door number is?

Answer: 17

10. A Volvo bus from Chennai to Bangalore has 5 stops in between. At each stop half of the people will get down. After reaching Bangalore there are only 2 people left out. How many people are there in the bus at starting?

Answer: 64

11. The figure below depicts the damage done to aircrafts that had returned their base from missions in World war 2. The bullet holes per square foot in the Tail, Wingtips, Fuselage, and Engine are 1.1, 1.5, 1.8, and 0.2 respectively. Where does the airforce need to primarily reinforce the aircraft to minimize losses to enemy fire and to maximize their return home?



Answer: Engine

12. There is a horse and a saddle. The sum of their cost is Rs.1100 the cost of the horse is Rs.1000 greater than saddle. What is the cost of saddle?

Answer: Rs. 50

### Programming Logic –

#### SLOT 3 –

1. What is the output of the following program?



```

#include<iostream>
using namespace std;
class PM{
public: void designation() {cout << "PM";}
};
class CEO{
public:
    CEO() {pmPtr = new PM; }
    PM *operator -> () {return pmPtr;}
    void designation() {cout << "CEO";}
private: PM *pmPtr;
    void designation() {cout << "CEO";}
private : PM *pmPtr;
};
int main() {
    CEO*ceoPtr;
    ceoPtr = new CEO;
    ceoPtr ->designation();
    delete ceoPtr;
}

```

Answer: CEO

2. The output when the following code is executed is

```

#include<stdio.h>

int main(){
int x=2;
if(x--, --x, x)
printf("TCS TNQT exam");
else
printf("TCS Ninja exam");
return 0;
}

```

- a. Compilation error - invalid if statement
- b. TCS Ninja exam
- c. Run time error
- d. TCS TNQT exam

Answer: TCS Ninja exam

3. What is the equivalent while loop for the for loop given below?

```
for(int i =0, j=5; k=10; i<10; i++ j+=5)
```

```
{  
    printf(j);  
}
```

a. 

```
i=0;  
j=5;,k=10;  
while(i<k)  
{  
    j=j+5;  
    i=i+1;  
    printf(j);  
}
```

b. 

```
i=0;  
j=5;,k=10;  
while(i<j+5)  
{  
    printf(j);  
    j=j+5;  
    i=i+1;  
}
```

c. 

```
i=0;  
j=5;,k=10;  
while(i<10)  
{  
    printf(j);  
    j=j+5;  
    i=i+1;  
}
```

d. 

```
i=0;  
j=5;,k=10;  
while(i<10){  
    j=j+5;  
    i=i+1;  
    printf(j);  
}
```

Answer:

```
i=0;  
j=5;,k=10;  
while(i<10)
```

```

{
    printf(j);
    j=j+5;
    i=i+1;
}

```

4. In C, there are functions like putchar(int c), fputc(int FILE\*), write (int, const void\*, size\_t),..... In an object oriented programming language like C++, all these functions can have the same name like write(int c), write(int, const void\*, size\_t).

This feature is called:

- Function prototyping
- Function modularizing
- Function overloading
- Function grouping

Answer: Function overloading

## SLOT 2 –

1. What is the output of the following Java program?

```

public class MyThread extends Thread
{
    public void run()
    {
        System.out.println("Before");
        this.stop();
        System.out.println("After");
    }
    public static void main (String[]args)
    {
        MyThread a=new MyThread();
        a.start();
    }
}

```

Answer: Before

5. What is the value of **result** in the following C program?

```

int a = -10, b = -5, flag = 1, result = 0, i;
int x = abs(a); int y = abs(b);
for(i=1; i<=x; i++)
    result +=y;
if((a>=0 && b<0) || (a<0 && b>=0))

```

```
Flag = -1;
result *= flag;
Answer: 50
```

6. In a class diagram, there is an arrow that starts at A and points at B. It means:

- a. A is the parent class of B
- b. B is the parent class of A
- c. A and B are loosely coupled
- d. A and B are tightly coupled

Answer: B is the parent class of A

7. What is the length of the string displayed by the following program?

```
#include <iostream>
using namespace std;
string do_something(string s)
{
    char char_array[]="::: ";
    size_t p1=s.find_first_not_of(char_array);
    size_t p2=s.find_first_of(char_array,p1);
    return s.substr(p1,p2-p1-1);
}
```

Answer: 13

8. What is the value of **maximum**, if the following segment runs to completion?

```
#include<limits.h>
int main()
{
    int i=0, maximum = INT_MAX;
    int numbers[] = {923, 948, 988, 981, 167, 899, 200, 910, 999};
    while(i<sizeof(numbers)/sizeof(numbers[0]))
    {
        if (maximum<numbers[i]) maximum=numbers[i]; i++;
    }
}
```

Answer: 2147483647

9. The **for** loop below computes **97+94+91+...+4**.

Replace the question mark (???) appropriately to complete the code snippet.

```
int i = 97, sum;
```



for (sum = 0; i >= 4; i = ???) sum += i;  
Your answer should not contain any blank space.

Answer: i-3

10. What's the output of the following program?

```
#include<cctype>
#include<iostream>
#include<algorithm>
using namespace std;
bool which (char c) {return isspace(c);}

int main()
{
char s[] = "How far is Chennai?";
char *p1 = s;
char *p2 = s + sizeof(s)/sizeof(char);
p2 = remove_if(p1,p2,which);
for(char *p = p1; p!= p2; p++)
cout << *p;

}
```

Answer: Howfarischennai?

11.

### SLOT 1 –

1. What is the output of the following Java program?

```
Class Super
{
    Static String greeting() {return "Goodnight";}
    String name() {return "Ram";}
}
Class Sub extends Super
{
    Static String greeting () {return "Hello";}
    String name() {return "Bheem";}
}
Public class Test
{
```

```

    public static void main (String[] args)
    {
        Super s=new Sub();
        System.out.println(s.greeting()+" "+s.name());
    }
}

```

Answer: Good night Bheem

2. What is the value of result in the following C Program?

```

int a=17, b=5, flag=1, result;
int x=abs(a),int y=abs(b);
for(result=0;x>y;result++)
x=y;
if((a>=0&& b<0)|| (a<0&& b>=0))
flag=1;
result*=flag;

```

Answer: 3

3. The function pallap() defined below takes a string as an argument and returns a boolean value.

```

bool pallap(string pinput)
{
    ispal = true
    i = 0
    j = length(pinput) - 1
    While (i < j)
    {
        If (pinput(i) != pinput(j))
        {
            ispal = false
        }
        i = i + 1
        j = j - 1
    }
    return ispal
}

```

In the above function != indicates "is not equal to".

If `redder = pallap("redder)`, `stressed = pallap("stressed = pallap("stressed")` and `party_trap = pallap("party_trap")` then

Answer: Redder is true stressed is false party\_trap is false

```
4. #include<algorithm>
using namespace std;
class SubFunction
{
public:
    bool operator()(const string & a, const string & b) {return a>b;}
};
int main ()
{
    vector <string> v={"abc","def","ghi","jkl","mno","pqr","stu","vwx","yz"};
    sort(begin(v),end(v),SubFunction());
    copy(begin(v),end(v),ostream_iterator<string>(cout,"\n"));
}
```

Answer:

yz  
vwx  
stu  
pqr  
mno  
jkl  
ghi  
def  
abc

5. What is the value of minimum, if the following segment runs to completion?

```
#include<limits.h>
int main()
{
    int i =0, minimum = INT_MIN;
    int number[] = {23, 48, 98, 1, 6, 8, 200, 10};
    while (i < sizeof(numbers)/sizeof(numbers[0])) {
        if(minimum > numbers[i]) minimum = numbers[i]; i++;
    }
}
```

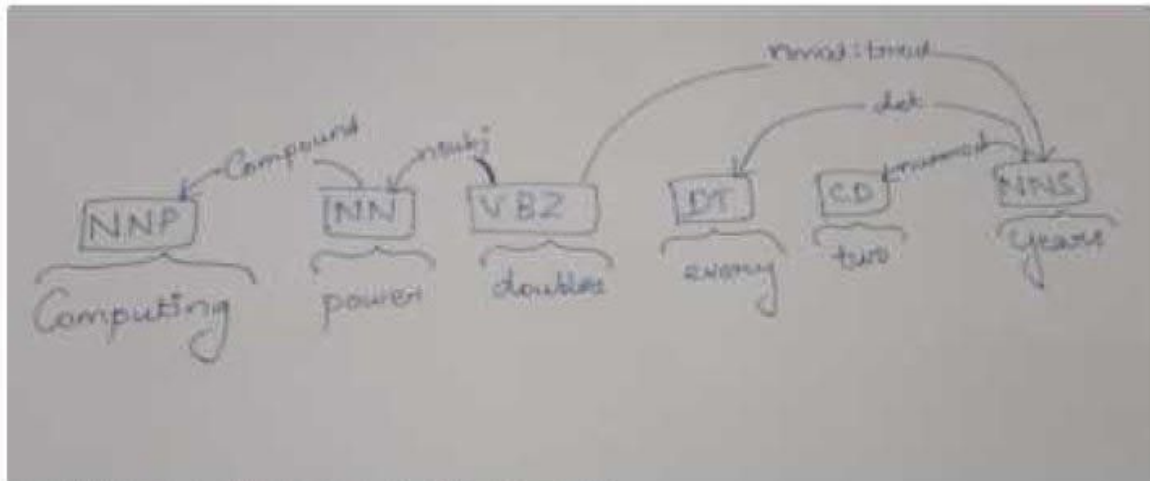


}

Answer: Minimum value is INT\_MIN = -2147483647

6. The picture represents a parse tree generated according to a specified grammar for the following sentence.

"Computing power doubles every two years"



How many leaf nodes are there for this tree?

- a. 4
- b. 3
- c. 2
- d. 5

Answer is 4.

7. What is the fourth line of output in the following C++ programme?

```
#include<vector>
#include<iterator>
#include<iostream>
#include<algorithm>
using namespace std;
Class SubFunction
{
public:
    bool operator()(const string &a, const string &b) {return a>b;}
};
int main()
{
    vector<string> v = {"abc", "def", "ghi", "jkl", "mno", "pqr", "stu", "vwx", "yz"};
```

```

        sort(begin(v), end(v), SubFunction());
        copy(begin(v), end(v), ostream_iterator<string>(cout, "\n"));
    }

```

Answer: fourth line of the output is pqr

8.

```

{
    // In the following initialization sequence, English character 'O' is not used
    String s[] = {"1234", "56789", "234a", "189b1", "089*3" };
    for (int i = 0; i < sizeof(s)/sizeof(s[0]); i++){
        auto pos = s[i].find_first_not_of("0123456789"); // 0 is numerical zero
        if (s[i].length() == 4 && pos == string::npos) continue;
        else cout << "Invalid guess!\n";
    }
}

```

Answer:

Invalid Guess!

Invalid Guess!

Invalid Guess!

Invalid Guess!

## Coding

### SLOT 3 –

#### **Sweet seventeen**

#### **Problem statement**

Given a maximum of four digit to the base 17(10 -> A, 11 -> B, 12 -> C, 16 -> G) as input, output its decimal value.

#### **Input - 1**

1A

#### **Expected Output**

27

#### **Input - 2**

23GF

### Expected Output

10980

### Correct code in C:

```
#include <stdio.h>
#include <math.h>
#include <string.h>

int main()
{
    char hex[17];
    long long decimal, place;
    int i = 0, val, len;
    decimal = 0;
    place = 1;
    scanf("%s", hex);
    len = strlen(hex);
    len--;
    for(i=0; hex[i]!='\0'; i++)
    {
        if(hex[i]>='0' && hex[i]<='9')
        {
            val = hex[i] - 48;
        }
        else if(hex[i]>='a' && hex[i]<='g')
        {
            val = hex[i] - 97 + 10;
        }
        else if(hex[i]>='A' && hex[i]<='G')
        {
            val = hex[i] - 65 + 10;
        }

        decimal += val * pow(17, len);
        len--;
    }
    printf("%lld", decimal);

    return 0;
}
```

### Correct code in Python:



```

def val(c):
    if c >= '0' and c <= '9':
        return ord(c) - ord('0')
    else:
        return ord(c) - ord('A') + 10;

def toDeci(str,base):
    llen = len(str)
    power = 1
    num = 0

    for i in range(llen - 1, -1, -1):

        if val(str[i]) >= base:
            print("Invalid Number")
            return -1
        num += val(str[i]) * power
        power = power * base
    return num

strr = input()
base = 17
print(toDeci(strr, base))

```

## SLOT 2 –

### *Oddly even*

Given a maximum of 100 digit numbers as input, find the difference between the sum of odd and even position digits.

Input #1:

4567

Expected output:

2

### Explanation

Sum of odd position digits 4 and 6 is 10. Sum of even position digits 5 and 7 is 12. The difference is 12-10=2.

Input #2:

9834698765123

Expected output:

1

Input #3:

5476

Expected output:

2

Correct code using Java:

```
import java.util.Scanner;
```

```
public class Ex2 {  
    public static void main(String[] args) {  
        Scanner s=new Scanner(System.in);  
        long a=s.nextLong();  
        long temp=a;  
        int flag=0,even=0,odd=0;  
        String aa=String.valueOf(temp);  
        int len=aa.length();  
        while(a>0)  
        {  
            long rem= a%10;  
            a/=10;  
            if(len%2==0)  
            {  
                if(flag==0)  
                {  
                    even+=rem;flag=1;  
                }  
                else if(flag==1)  
                {  
                    odd+=rem;flag=0;  
                }  
            }  
            else  
            {  
                if(flag==0)  
                {  
                    odd+=rem;flag=1;  
                }  
                else if(flag==1)  
                {  
                    even+=rem;flag=0;  
                }  
            }  
        }  
    }  
}
```

```

        {
            even+=rem;flag=0;
        }
    }

    int sum=odd-even;
    if(sum<0)
    {
        sum=-sum;
    }
    System.out.println(sum);
}
}

```

## SLOT 1 –

NOTE: Once you have selected your programming language, click on the checkbox beside it to start coding.

Word is key

### Problem statement

One programming language has the following keywords that cannot be used as identifiers:

break, case, continue, default, defer else, for, func, goto, if, map, range, return, struct, type, var

Write a program to find if the given word is a keyword or not

Example-1

Input

defer

Expected Output

defer is a keyword

Example-2

Input

While



Expected Output  
while is not a keyword

Correct code using C-

```
#include<stdio.h>

#include<string.h>

int main()
{
    char
    str[16][10]={"break","case","continue","default","defer","else","for","func","goto","if",
    ,"map","range","return","struct","type","var"};

    char input[1][20];

    int flag = 0;

    scanf("%s",input);

    for(int i = 0;i<strlen(str);i++)
    {
        if(strcmp(input,str[i])==0)
        {
            flag = 1;

            break;

        }
    }

    if(flag == 1)
    {
        printf("%s is a keyword",input);
    }

    else
    {
```

```

        printf("%s is not a keyword",input);
    }
}

```

#### Correct code using Java –

```

import java.util.Scanner;

public class Ex1 {
    public static void main(String[] args) {
        String[]
a={"break","case","continue","default","defer","else","for","func","goto","if","map","range","return","struct","type","var"};
        String b;int flag=0;
        Scanner s=new Scanner(System.in);
        b=s.next();
        for(int i=0;i<10;i++)
        {
            if(a[i].equalsIgnoreCase(b))
            {
                flag=1;
            }
        }
        if(flag==1)
        {
            System.out.println(b+" is a keyword");
        }
        else{
            System.out.println(b+" is not a keyword");
        }
    }
}

```

#### Correct code using Python –

```

keyword = {"if","else","break","case","goto","continue","return","range"}
inp = input()
if inp in keyword:
    print("Given string is keyword")
else:

```

```
print("not a keyword")
```