

# 2020 - TCS NQT

## SLOT 1:

### NUMERICAL ABILITY

**Question 1-** What is the sum ( in RS) which when divided among X Y Z in the proportion 3:5:7 provides rupees 8000 more to Z then what it would have done to him when the proportion is 11 : 15 : 19?

1. 180000
2. 120000
3. 175000
4. 135000

**Answer:** 180000

**Question 2-** If the positive square root of (root 90 + root 80 ) is multiplied by (root (2 -1)) and the product is raised to the power of four, the result would be

1. 100
2. 1600
3. 11520000
4. 10

**Answer:** 10 (use the TCS calculator directly to find the answer of this question)

**Question 3-** A man has to travel 50 km in 2 hours. He could cover 20 km in one hour, and then had to stop for 10 minutes for refueling. By What factor should he increase his speed with reference to that during the first hour so as to be able to complete the journey as per schedule?

1. 1.5
2. 1.8
3. 1.2
4. 2.4

**Answer:** 1.8

**Question 4-** X is four times as efficient as Y in respect of doing a particular work. Working together they complete the work in 16 days. In how many days y working alone will be able to half the work?

1. 80
2. 20
3. 40
4. 60

Efficiency of X = 4a

Efficiency of Y = a

Time taken by both to complete a work = 16 days

$$\frac{1}{4a} + \frac{1}{a} = \frac{1}{16}$$

$$\frac{(1+4)}{4a} = \frac{1}{16}$$

$$\frac{5}{4a} = \frac{1}{16}$$

$$a = 20$$

Hence X will do the work in 20 days

And Y will do the work in 80 days

Thus Y will do half of work in 40 days

**Question 5-** If  $5^x \times 3^y = 225 \times 405$ , find the value of  $x^2y - 3x$

1. 27
2. 81

3. 125
4. 25

**Question 6-** The collection of numbers which comprise the data given below is arranged in ascending order.

(3,7,9, N - 1,15,18,19,20)

If the median of the data is 12.5, what is the value of N?

1. 10.5
2. 11.5
3. 11
4. 12

**Answer - 11**

Median of the even data = (sum of middle terms) / 2  

$$= [(N - 1) + 15] / 2 = 12.5$$

**Question 7 -** How much percentage is (0.025% of 240% of 1.5) of 0.9?

1. 10
2. 0.01
3. 0.1
4. 1

**Question 8 -** After purchasing two copies of the same book, X sold them respectively at 0.8 and 1.4 times their cost prices. What was the percentage gain earned or loss incurred by X?

1. 10% loss
2. 5% gain
3. 10% gain
4. 5% loss

**Answer:** 10% gain

Let the C.P of each copy be Rs 100

ATQ one copy is sold at  $0.8 \times 100 = 80$

One copy is sold at  $1.4 \times 100 = 140$

Total money spent in buying the copies = Rs 200

Total money earned after selling the copies = Rs (80 + 140) = Rs 220

Total gain of Rs 20. Therefore gain% = 10%.

**Question 9:** A file of cadets consisting of ten rows and five columns measures 420 m in length along the direction of their marching. How much time (in hours and minutes) would it take to march for a stretch of 3 km, if the stride of each cadet is 80 cm and he takes 57 strides per minute?

1. 1 hr 10 min
2. 1 hr 20 min
3. 1 hr 24 min
4. 1 hr 15 min

**Question 10:** Two vessels X and Y of capacities one and two litres respectively are completely filled with mixtures of two chemicals A and B. The ratio by volume of the chemicals A and B in X and Y are 3:2 and 4:5 respectively. The contents of A and B are mixed and the combination is kept in a vessel C of capacity of four litres. How many litres of Chemical A should be added to the combination so as to make the ratio of A to B equal to 1:1?

1.  $1/270$
2.  $1/67$
3.  $1/68$
4. Not visible

**Question 11** -The diameter of a pizza is 30 cm. What is the area(in  $\text{cm}^2$ ) of the upper surface of a sector of the pizza whose arc length is 8 cm?

1. 120
2.  $120\pi$
3.  $60\pi$
4. 60

**Answer:** Area of sector when arc is given =  $(L \times r)/2$

Where L = length of arc and r = radius of the circle

Here L = 8 cm and r = 15 cm

Therefore, Area =  $(8 \times 15)/2 = 60\text{cm}^2$

**Question 12-** In a competitive exam, 5 marks are awarded for every correct answer and for every wrong answer, 2 marks are deducted. Sathwik scores 32 marks in the examination. If 4 marks had been awarded for each correct answer and 1 mark had been deducted for each incorrect answer, Sathwik would have scored 34 marks. If Sathwik attempted all the questions, how many questions were there in the test ?

1. 14
2. 12
3. 20
4. 26

**Answer:** 26 Answer

In given Question:-

Correct answer =  $5x$  and wrong answer =  $2y$

Correct answer =  $4x$  and wrong answer =  $1y$

So,

$$5x - 2y = 32$$

$$4x - 2y = 34 \text{-----} \times 2$$

Now

$$5x - 2y = 32$$

$$8x - 4y = 68$$

By solving

$$3x = 36$$

$$x = 12$$

Now to find 'y'

$$5 \times 12 - 2y = 32$$

$$60 - 2y = 32$$

$$y = 14$$

By adding x+y

$$12 + 14 = 26$$

Questions in the test = 26

**Question 13-** An item was sold at a profit of 12% after giving a discount of 12.5% on the list price. What would be the gain or loss percentage if a discount of 25% is given on the list price ?

1. 2.5% gain

2. 2.5% loss
3. 4% loss
4. 4% gain

Answer - 4% loss

**Question 14-** The mean of a set of data is 5. What will be the mean if ten is subtracted from each data ?

1. -5
2. 5
3. 10
4. -15

**Answer** = -5

Explanation

let the number of data be  $n$

so sum of data = mean \* number of data  
 $= 5n$

now 10 is subtracted to each data

so now sum becomes  $= 5n - 10n = -5n$

mean = sum of data / no. of data  
 $= -5n/n = -5$

so new mean becomes -5

**Question 15-** If  $(x+10)\%$  of 240 is 60% more than  $x\%$  of 180, then 15% of  $(x+20)$  is what percent less than 25% of  $x$  ?

1. 15
2.  $19\frac{1}{21}$
3. 16
4.  $15\frac{1}{2}$

**Questions 16-** What is the diameter (in cm) of a solid right circular cylinder whose height is 6 cm and the area of the curved surface is five times the combined area of the two flat surfaces

1. 2.4
2. 0.91.2
3. 3

**Answer:** 1.2

Here  $h = 6$  cm

C.S.A =  $2\pi rh$

$2\pi rh = 5(2\pi r)$

$2 \times \pi \times r \times 6 = 10 \times \pi \times r^2$

$12 \times \pi \times r = 10 \times \pi r^2$

$12 = 10r$

$1.2 = r$

**Questions 17-** A sum invested on simple interest grows to Rs 22500/- and Rs 25500/- is seven and nine years respectively. What is the rate percentage of the interest ?

1. 7.5
2. 9.6
3. 12.5
4. 13.5

**Answer:**

**Question 18-** What is the value of  $(0.0000128)^{17}$ ?

1. 0.5
2. 5
3. 0.2
4. 2

Solution :-  $\frac{1}{5} = 0.2$

**Question 19 -** The variation in temperatures throughout the day in a desert town was studied on the basis of the record of minimum and maximum temperatures which were 36 and degrees centigrade respectively. What was the standard deviation in degree centigrade?

1. **12**
2. **22**
3. **14**
4. **28**

**Question 20 -** A sum of Rs. 30000 invested in a scheme where the interest gets compounded annually and grows to Rs. 51840 in three years. How much interest in Rs. would have got accrued in six months in the same scheme had the interest been compounded quarterly?

1. 3075
2. 2975
3. 3024
4. 3126

**Question 21-** The diameter of a pizza is 30 cm. What is the area (in of the upper surface of a sector of the pizza whose arc length is 8 cm?

1. 120
2. 120
3. 60
4. 60

**Question 22-** 96 men were engaged for a project of constructing a railway track of the length of 18 km in four weeks. After one week it was observed that the work of 4m was completed. How many additional men should be engaged for timely completion of the project?

1. **16**
2. **14**
3. **15**
4. **12**

**Question 23-** If  $n$  is an integer such that  $1nn352$  is a six-digit number exactly divided by 24, what will be the sum of the possible value of  $n$ ?

1. 27
2. 15
3. 9
4. 21

Solution:-

**Question 24**

What is the mean deviation of the data 8,9,12,15,16,20,24,30,32,34?

A.10.2

B.8

C.0

D.9.6

Solution:-

Step 1

Find the mean

$$8+9+12+15+16+20+24+30+32+34/10$$

$$=200/10$$

$$=20$$

Find the distance of each value from that mean

Value	Distance from 20
8	12
9	11
12	8
15	5
16	4
20	0
24	4
30	10
32	12

34

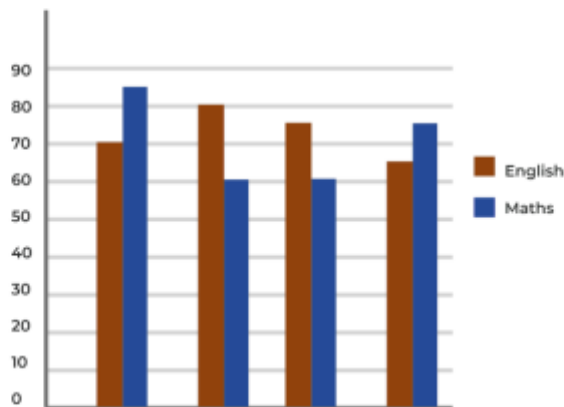
14

Step 3:- Find the mean of those distances

$$12+11+8+5+4+0+4+10+12+14/10$$

$$80/10=8$$

**Question 25** - The marks scored by a student out of 100 in English and Mathematics at four consecutive monthly test held in 2019 are presented through a Bar Graph shown below. In each case the marks is a multiple of five. In which month is the difference of marks scored in the two subjects the highest ?



1. Jan
2. Mar
3. Apr
4. Feb

**Question 26-**

The temperature (in  $^{\circ}\text{F}$ ) of a patient was recorded (using a clinical thermometer with smallest division equal to  $1^{\circ}\text{F}$ ) during 6 AM to 8PM on four consecutive days, A, B, C, D at intervals of two hours and the results are presented in a tabular form given below. The reading at a particular time provides the average body temperature (ABT) of the patient for the previous one hour. He is supposed to be given temperature controlling medicine (TCM) at the bedtime if the total duration of his ABT remaining above  $99^{\circ}\text{F}$  during the 14 hour period of record is four hours or more. on which day, TCM was required?

Day/Time	0600	0800	1000	1200	1400	1600	1800	2000
A	101	100	99	98	99	98	100	100
B	98	99	100	100	99	99	100	102
C	98	99	99	101	100	99	99	100
D	98	98	99	99	99	98	98	99

- A
- D
- B
- C

## VERBAL ABILITY

**Question 1** - For the four sentences S1 to S4 paragraph below, sentences S1 and S4 are given. From the options P Q and R, choose appropriate sentences for the following.

S1- Gandhi does not reject machinery as such

**S2-**

**S3-**

S4 what he objects to is the craze for machinery, not machinery as such.

P: He says that today, machinery merely helps a few to ride on the back of millions.

Q: And adds that the spinning wheel is a machinery, a little toothpick is a machine.

R: He observes "How can I be against machinery when I know that even this body is a most delicate piece of machinery"

1. QP

2. QR

3. RQ

4. PQ

Ans PQ

**Question 2 :** Which of the following sentences does NOT use informal language?

1. Did you locate our office quite easily?

2. You will be working with different managers during your training

3. **We shall endeavour to inform you of the position in two weeks time**

4. Is there anything else you want to ask?

**Answer - C.. Use of endeavour is formal. Informal would be try.**

**Question 3:** One part of the sentence below may contain an error. Identify the part.

If there is no error, choose 'No Error'

Everyday life have become more complicated with the advancement in mobile technology.

1. **Everyday life have become**

2. No error

3. advancement in mobile technology

4. more complicated with the

**Answer - A . everyday life has become (life is singular)**

**Question 4 :** The following three sentences can be revised into one better sentence.

Choose the sentence that is the best revision:

I was at the fair. I got lost. I got scared

1. I am scared after I am lost at the fair

2. I went to the fair and got scared as i was lost

3. I am lost the fair so i am too scared

4. **I got lost at the fair and was scared**

**Answer - D**

**This sentence combines all the elements of the 3 sentences with a proper use of conjunction and tenses.**

**Question 5** - Government have been promising the eradication of child labour in high-risk industries in India for many years. However, almost 100 million children are still not able to go to school, and around 10 million are working in (1)



\_\_\_\_\_ industries. India has the biggest child population of 380 million in the world \_\_\_\_\_ number of children who are forced to earn a living.

Blank 1

A. honorary B. hazardous C. handicraft D. hardware

Blank 2.

A. largest B. lowest C. latest D. loudest

**Question 6 :** Which of the following sentences does NOT use informal language?

1. Did you locate our office quite easily?
2. You will be working with different managers during your training
3. **We shall endeavour to inform you of the position in two weeks time**
4. Is there anything else you want to ask?

**Answer - C.. Use of endeavour is formal. Informal would be try.**

**Question: 7** One part of the sentence below may contain an error. Identify the part. If there is no error, choose 'No Error'

Everyday life have become more complicated with the advancement in mobile technology.

1. **Everyday life have become**
2. No error
3. advancement in mobile technology
4. more complicated with the

**Answer - A . everyday life has become (life is singular)**

**Question 8:** The following three sentences can be revised into one better sentence. Choose the sentence that is the best revision:

I was at the fair. I got lost. I got scared

1. I am scared after I am lost at the fair
2. I went to the fair and got scared as i was lost
3. I am lost the fair so i am too scared
4. **I got lost at the fair and was scared**

**Answer - D**

This sentence combines all the elements of the 3 sentences with a proper use of conjunction and tenses.

**Question 9 :** Henry looks carefully into the telescope which lets him see far, far away, as far as the distant nebulae on the far edges of the Milky Way. Henry is an \_\_\_\_\_. He looks at the sky and stars in particular. Even though he spends much of his time looking at detailed computer reports, which are just lists and lists of numbers. His \_\_\_\_\_ thing about his job is looking through the telescope. And today he is very excited. He isn't sure yet, but he thinks he has seen a dense cloud which might be the beginning of a new star.

Blank 1 - A. astrologer B - astrologist C -astronomer D - Astronaut

Blank 2 - A. favoring B - pleasant C - pleasing D - favourite.

1. D , B
2. C , D
3. A , A
4. B , C

Answer - B ( C , D)

Henry is an **astronomer** (who studies the stars and planets) and his **favourite** thing is to look at the sky.

**Question 10 :** Fill in the blanks with the most appropriate set of words from the options given below.

What did the painter do \_\_\_\_\_ himself from falling?

When he felt the ladder \_\_\_\_\_ he grabbed the gutter to save himself from falling.

1. To save / began slipping
2. To save / beginning to slip
3. To save / begin to slip
4. For saving / began to slip

Answer -

Explanation -

**Question 11:** You are going to read a text about an artist. Some sentences are missing from the text. Choose from the list. (A-C) the most appropriate sentence for each gap (1-2) in the text. There is one extra sentence that you do not need to use. Kahini held her first solo show in 1998, the entire proceeds of which went to the Helen Keller institute for the Deaf and Blind in Mumbai. \_\_\_\_\_ Encountering the pathless terrain of inner landscape, the artist engages in a restless re-examination of idea and image. \_\_\_\_\_ She has also taken part in several art camps.

1. In her fifth solo show with acrylic and oil-on-canvas paintings in the series titled 'Metamorphosis' held recently at the Mumbai's Jehangir Art Gallery. She showed for the first time her abstract work as well.
  2. Her work has been acquired by corporate houses and also forms part of private collections.
  3. She has participated in a group show along with 50 women artists to celebrate International Women's Day
1. A,C
  2. C,B
  3. B,A

**Question**

**Question 13:** Aisha had been very successful managing her team in Edinburgh and was asked by the company to lead a remote team for an important two- year project. Keen to demonstrate her leadership \_\_\_\_\_. Aisha got her team members together for a remote meeting. But right from that first meeting , she realized that this was going to be a different challenge.

1. \_\_\_\_\_ Lucia kept asking about really specific details while Aisha was hoping to use the meeting to get to know the team members and identify..... Archies and Lucia .....and when they didn't speak, there was an uncomfortable silence. Valentina hardly said a word. \_\_\_\_\_ Without these visual clues, Aisha had no idea whether people were .....
  1. No one had their cameras on, so there was none of the usual communication through body language and facial expressions.
  2. Compared to a face-to-face meeting the remote team is not preferred by all the managers
  3. For a start, Archie was late for the meeting by about 15 minutes because of the 'technical problems'.
1. A , C

2. B , A
3. A , B
4. **C , A**

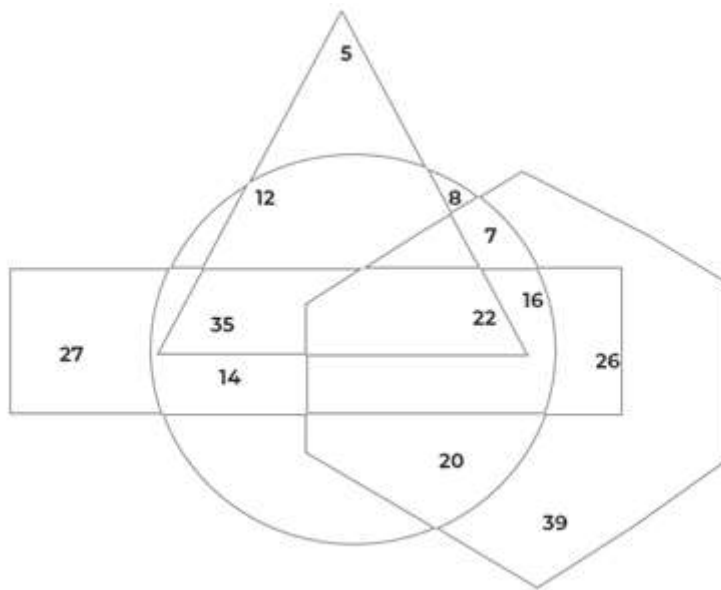
**Answer - C, A**

**C starts with (for a start) hence this will be the beginning.**

**A talks about lack of visual clues which satisfies the sentence following the blank.**

### LOGICAL ABILITY

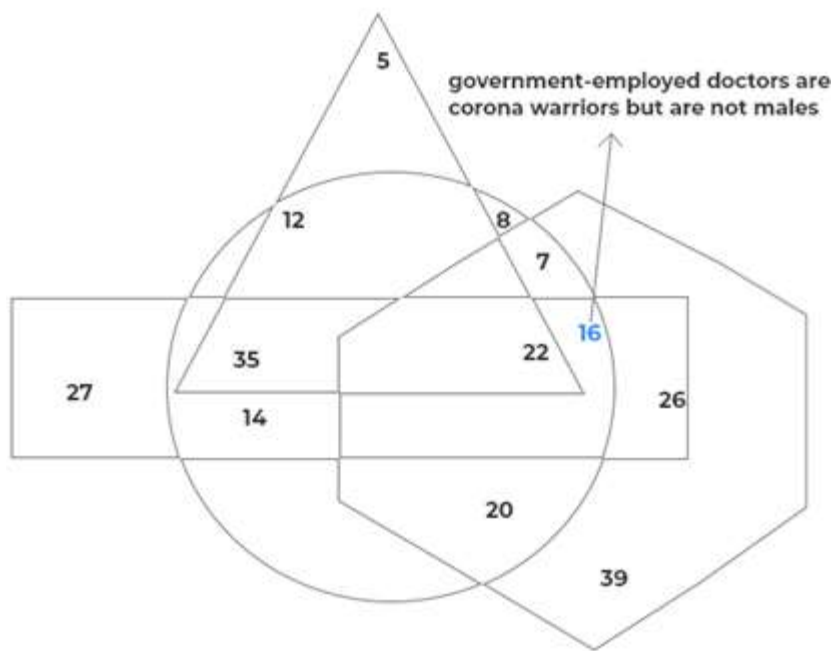
**Question 1:** In the following diagram, the triangle stands for “males”, the circle stands for “doctors”, the rectangle stands for “government employed”, the hexagon stands for “corona warriors”. The numbers in different segments show the number of persons for that segment.



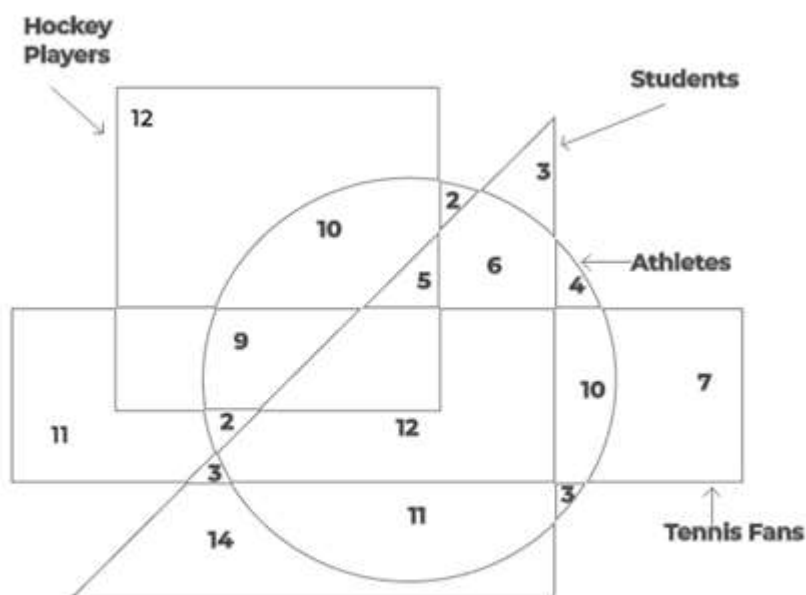
How many government-employed doctors are corona warriors but are not males?

1. 14
2. 23
3. 16
4. 17

**Solution:**



**Question 2:** In the following diagram, the rectangle stands for tennis fans, the circle stands for athletes, and the triangle stands for students, and the square stands for hockey players. The number in different segments show the number of persons.



How many athletes playing hockey are either students or tennis fans but not both

1. 18
2. 15
3. 14
4. 3

Solution:



- A is not a lawyer or engineer
- The doctor is from Lucknow
- D is an architect
- The lawyer is from Pune
- The engineer is neither from Chandigarh nor Pune
- D is not from Pune
- C is from Indore

**Question 2:** The number of employees working in six different departments in two companies A and B are given below. Study the given data and answer the questions that follow.

**Company A**

Departement	No of Employees
Marketing	256
HR	72
Production	504
Accounts	68
Operations	256
Planning	46
<b>Total</b>	<b>1202</b>

**Company B**

Department	No of Employees
Marketing	524
HR	108
Production	736
Accounts	122
Operations	146
Planning	58
<b>Total</b>	<b>1694</b>

What is the percentage difference between the employees working in the production department of company A and B.

1. 3.21%
2. 2.27%
3. 1.52%
4. 1.15%

Solution:

**Question-** If both company A and B merge together to form company C, then what is the percentage of marketing and accounting employees in total employees of company C?

1. 33.49%
2. 37.59

**Question:** Select the most appropriate option to fill in the blank.

The final report on the project was \_\_\_\_\_ into three parts.

1. Broken out
2. Broken off
3. Broken up
4. Broken away

Answer:

**Question:** A statement is followed by two assumptions numbered I and II. Consider the statement and decide which of the given assumption(s) is/are implicit in the statement.

**Statement-**

Various government across the world have issued strict guidelines for the public to wear masks and wash hands regularly to safeguard their health during covid-19 pandemic.

**Assumptions-**

1. Covid-19 Pandemic is serious health issue.
2. There are ways by which people can save themselves from Covid-19 pandemic.

**Options-**

1. Neither I nor II is implicit
2. Both I and II are implicit
3. Only II is implicit
4. Only I is implicit

**Answer-** Both I and II are implicit

Q3. What is the wrong number in the following series?

CMQ , FPT , JTX , OYC , UFI

- a. OYC
- b. JTX
- c. FPT
- d. UFI

Solution:- UFI is the wrong number in the series.

Lets take CMQ

Difference between letter C and Letter M is 10 and difference between M and Q is 3

..same with OYC , JTX, FPT

But not with UFI

Question:- In a certain code ,  $K * N$  means K is the brother of N ,  $K + N$  means K is the husband of N,  $K \times N$  means K is the mother of N and  $K \div N$  means K is the sister of N , then which of the following expressions means C is the daughter of Y.?

1.  $Y + R \times C * H \div V$
2.  $Y + R \times H \div C * V$
3.  $Y + R \times H * C \div V$
4.  $Y \times R + H * C \div V$

Solution:-

Question:- Given below is a question followed by two statements , I and II, each containing some information. Decide which of the statement(s) is/ are sufficient to answer the question.

How is A related to C?

Statements:-

1. A is the wife of B and B is the brother of C.
2. C is the son of D
1. Statement I alone is sufficient.
2. Statement II is sufficient.
3. Both I and II together are sufficient
4. Both I and II together are not sufficient.

Solution:- Both 1 and 2 together are not sufficient

### PROGRAMMING LOGIC

**Question 1-** What will be the output

```
public class Main {  
    public static void main(String[] args)  
    {  
        int $ = 5;  
    }  
}
```

1. Nothing will print
2. Symbol not found Error.
3. Runtime Error
4. Compile time error

**Answer- 1.Nothing will print**

**Question 2-**

```
class Main  
{  
    public static void main(String args[])  
    {  
        int i,j,x=0;  
        for(i=0;i<5;i++)  
            for (j=0;j<5;j++){  
                x=(i+j-1);  
                System.out.print(x);  
                break;  
            }  
        System.out.print(x);  
    }  
}
```

What will be printed when the above sample code is executed.

Enter your answer ONLY as a NUMERAL, in the box.

**Answer- -101233**



**Question 3-** Which of the following options best suits for 'Memory Leak Occurred'

1. Resource allocation pending while debugging the code
2. Program releases resources allocated in the memory
3. Program does not free the memory which is allocated dynamically
4. Occurs due to address assignment failure.

**Answer- Program does not free the memory which is allocated dynamically.**

**Question 4-** What among the following is a server based paradigm

1. Request for Information(RFI)
2. Data Validation Routine
3. Cloud computing
4. Total cost of Ownership.

**Answer- Request for information**

**Question 5-** When we declare constant pointer to integer, we CANNOT change:

1. Value pointed by pointer
2. Either addressing pointer variable or value at that address
3. Changes are not permitted
4. Address in pointer variable.

**Answer- Address in the pointer variable.**

**Question 6-** Given here is a scenario. Consider the graph algorithm and answer the given question.

John wants to go to different locations of the city in which he is. He has listed all of them down. However he wants to visit one location before visiting some other location. What application of graphs can he use to determine that location?

1. DFS
2. Dijkstra's
3. BFS
4. Topological Sorting

**Answer- Dijkstra's**

**Question 7 -** Find Prefix and Postfix for the below Infix problem statement:

1. Prefix Expression:  $11\ 20\ 5\ 20\ 15 - 6\ 5\ \wedge\ * / +$   
Postfix Expression:  $+ 11 / 20 * 5 \wedge - 20\ 15\ 6\ 5$
2. Prefix Expression:  $+ 11 / 20 * 5 \wedge - 20\ 15\ 6\ 5$   
Postfix Expression:  $11\ 20\ 5\ 20\ 15 - 6\ 5\ \wedge\ * / +$
3. Prefix Expression:  $11\ 20\ 15\ 20\ 5 - \wedge\ * 6\ 5 / +$   
Postfix Expression:  $+ 20 / 11 * 5 - 20 \wedge 15\ 6\ 5$
4. Prefix Expression:  $11\ 20\ 5\ 20\ 15 - \wedge\ * / + 6\ 5$   
Postfix Expression:  $+ 11 / \wedge - 20 * 5\ 20\ 15\ 6\ 5$

**Question 8 -** There are two integer numbers X and Y, and the value of X and Y is in between 0 to 25. User stores the value under 5 bit number. How many minimum bit is required to store the result of the below expression?

$\text{Res} = 3*(X-Y)$

1. 7
2. 5
3. 8
4. 6

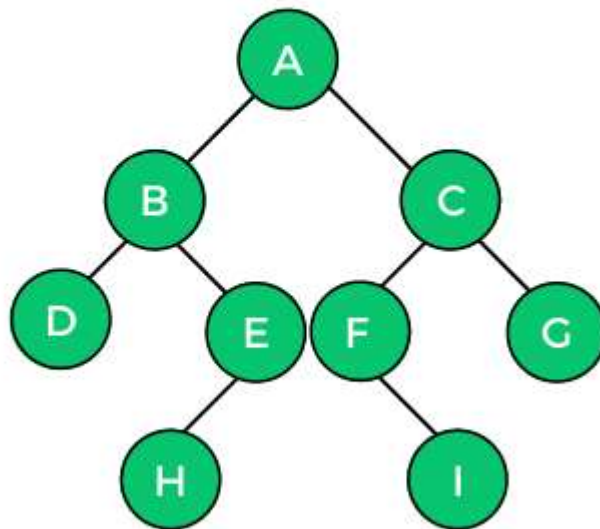
**Answer-**

**Question 9-** Write the name of library of functions which is used to perform arithmetic operations on BigInteger and BigDecimal

**Answer- MathContext**

**This question in TCS NQT was wrong. Incorrect options were given ....**

**Question 10 - Consider the following tree what will be the preorder traversal.**



1. A B C D E F G H I
2. D H E B I F G C A
3. H I D E F G B C A
4. D H E B A F I G C

**Answer- ABDEHCFIG**

### **CODING**

There is a JAR full of candies for sale at a mall counter. JAR has the capacity N, that is JAR can contain maximum N candies when JAR is full. At any point of time, JAR can have M number of Candies where  $M \leq N$ . Candies are served to the customers. JAR is never remain empty as when last k candies are left. JAR is refilled with new candies in such a way that JAR get full. Write a code to implement above scenario. Display JAR at counter with available number of candies. Input should be the number of candies one customer can order at point of time. Update the JAR after each purchase and display JAR at Counter. Output should give number of Candies sold and updated number of Candies in JAR.

If Input is more than candies in JAR, return: "INVALID INPUT"

Given,

N=10, where N is NUMBER OF CANDIES AVAILABLE

$K \leq 5$ , where  $k$  is number of minimum candies that must be inside JAR ever.

**Example 1: (N = 10, k ≤ 5)**

**Input Value**

3

**Output Value**

NUMBER OF CANDIES SOLD : 3

NUMBER OF CANDIES AVAILABLE : 7

**Example : (N=10, k≤5)**

**Input Value**

0

**Output**

INVALID INPUT

NUMBER OF CANDIES LEFT : 10

**Value**

**Solution in C**

```
#include <stdio.h>
int main()
{
    int n=10, k=5;
    int num;
    scanf("%d",&num);
    if(num>=1 && num<=5)
    {
        printf("NUMBER OF CANDIES SOLD : %d\n",num);
        printf("NUMBER OF CANDIES LEFT : %d",n-num);
    }
    else
    {
        printf("INVALID INPUT\n");
        printf("NUMBER OF CANDIES LEFT : %d",n);
    }
    return 0;
}
```

**Solution in C++**

```
#include <iostream>
using namespace std;
int main()
{
    int n=10, k=5;
    int num;
    cin>>num;
    if(num>=1 && num<=5)
    {
        cout<<"NUMBER OF CANDIES SOLD : "<<num<<"\n";
        cout<<"NUMBER OF CANDIES LEFT : "<<n-num;
    }
    else
    {

```

```

        cout<<"INVALID INPUT\n";
        cout<<"NUMBER OF CANDIES LEFT : "<<n;
    }
    return 0;
}

```

### **Solution in Java**

```

import java.util.Scanner;
class Main{
    public static void main(String[] args) {
        int n = 10, k = 5;
        int num;
        Scanner sc = new Scanner(System.in);
        num = sc.nextInt();
        if(num >= 1 && num <= 5) {
            System.out.println("NUMBER OF CANDIES SOLD : " + num);
            System.out.print("NUMBER OF CANDIES LEFT : " + (n - num));
        } else {
            System.out.println("INVALID INPUT");
            System.out.print("NUMBER OF CANDIES LEFT : " + n);
        }
    }
}

```

Selection of MPCSC exams include a fitness test which is conducted on ground. There will be a batch of 3 trainees, appearing for running test in track for 3 rounds. You need to record their oxygen level after every round. After trainee are finished with all rounds, calculate for each trainee his average oxygen level over the 3 rounds and select one with highest oxygen level as the most fit trainee. If more than one trainee attains the same highest average level, they all need to be selected.

Display the most fit trainee (or trainees) and the highest average oxygen level.

Note:

1. The oxygen value entered should not be accepted if it is not in the range between 1 and 100.
2. If the calculated maximum average oxygen value of trainees is below 70 then declare the trainees as unfit with meaningful message as "All trainees are unfit"
3. Average Oxygen Values should be rounded.

Example 1:

INPUT VALUES

```

95
92
95
92
90
92
90

```

92

90

### OUTPUT VALUES

Trainee Number : 1

Trainee Number : 3

#### Note:

Input should be 9 integer values representing oxygen levels entered in order as  
Round 1

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 2

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

Round 3

Oxygen value of trainee 1

Oxygen value of trainee 2

Oxygen value of trainee 3

**Output must be in given format as in above example. For any wrong input final output should display "INVALID INPUT"**

#### Solution in C

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

```
int main()
```

```
{
```

```
    int trainee[3][3];
```

```
    int average[3] = {0};
```

```
    int i, j, max=0;
```

```
    for(i=0; i<3; i++)
```

```
    {
```

```
        for(j=0; j<3; j++)
```

```
        {
```

```
            scanf("%d", &trainee[i][j]);
```

```
            if(trainee[i][j]<1 || trainee[i][j]>100)
```

```
            {
```

```
                trainee[i][j] = 0;
```

```
            }
```

```
        }
```

```
    }
```

```
    for(i=0; i<3; i++)
```

```
    {
```

```
        for(j=0; j<3; j++)
```

```
        {
```

```
            average[i] = average[i] + trainee[j][i];
```

```
        }
```

```
        average[i] = average[i] / 3;
```

```
    }
```

```

    for(i=0; i<3; i++)
    {
        if(average[i]>max)
        {
            max = average[i];
        }
    }
    for(i=0; i<3; i++)
    {
        if(average[i]==max)
        {
            printf("Trainee Number : %d\n",i+1);
        }
        if(average[i]<=70)
        {
            printf("Trainee is Unfit");
        }
    }
    return 0;
}

```

### **Solution in C++:**

```

#include <iostream>
using namespace std;
int main()
{
    int trainee[3][3];
    int average[3] = {0};
    int i, j, max=0;
    for(i=0; i<3; i++)
    {
        for(j=0; j<3; j++)
        {
            cin>>trainee[i][j];
            if(trainee[i][j]<1 ||
trainee[i][j]>100)
            {
                trainee[i][j] = 0;
            }
        }
    }
    for(i=0; i<3; i++)
    {
        for(j=0; j<3; j++)

```

```

        {
            average[i] = average[i] +
trainee[j][i];
        }
        average[i] = average[i] / 3;
    }
    for(i=0; i<3; i++)
    {
        if(average[i]>max)
        {
            max = average[i];
        }
    }
    for(i=0; i<3; i++)
    {
        if(average[i]==max)
        {
            cout<<"Trainee Number :
"<<i+1<<"\n";
        }
        if(average[i]<=70)
        {
            cout<<"Trainee is Unfit";
        }
    }
    return 0;
}

```

### **Solution in Java:**

```

import java.util.Scanner;
class Main {
    public static void main(String[] args) {
        int[][] trainee = new int[3][3];
        int[] average = new int[3];
        int max = 0;
        Scanner sc = new Scanner(System.in);
        for(int i = 0; i < 3; i++) {
            for(int j = 0; j < 3; j++) {
                trainee[i][j] = sc.nextInt();
                if(trainee[i][j] < 1 ||
trainee[i][j] > 100) {
                    trainee[i][j] = 0;
                }
            }
        }
    }
}

```

```

        }
    }
    }
    for(int i = 0; i < 3; i++) {
        for(int j = 0; j < 3; j++) {
            average[i] = average[i] +
trainee[j][i];
        }
        average[i] = average[i] / 3;
    }
    for(int i = 0; i < 3; i++) {
        if(average[i] > max) {
            max = average[i];
        }
    }
    for(int i = 0; i < 3; i++) {
        if(average[i] == max) {
            System.out.println("Trainee
Number : " + (i + 1));
        }
        if(average[i] <= 70) {
            System.out.print("Trainee is
Unfit");
        }
    }
}
}

```



## SLOT 2:

### Numerical Ability

Q1. What is the fourth proportional of 0.006, 1.2 &  $\frac{6}{25}$  ?

- A. 36
- B. 48
- C. 4.8
- D. 3

Answer: Option B

Q2. The present ages of three brothers are in the proportion 12:14:17. The difference between the ages of the elder and the eldest is 6 years. What will be the proportion of their ages after four years?

- A. 14:16:19
- B. 40:46:55
- C. 16:18:21
- D. 13:15:18

Answer: Option A

Q3. Two ants of length 1cm and 1.2 cm crawl in opposite directions with average speeds 2 and 1 mm per second respectively. How many seconds will they take to cross each other?

- A. 4.4
- B. 2.8
- C. 0.4
- D. 1.5

Answer: Option A

Q4. The index numbers of five commodities are 121, 123, 125, 126, 128 and the weights assigned to these are respectively 5, 11, 10, 8, 6. Then what is the weighted average index number?

- A. 123.8
- B. 124.2
- C. 124.6
- D. 125.2

Answer: Option C

Q5. Which one among the following has the least value?

- A.  $\sqrt{75} - \sqrt{74}$
- B.  $\sqrt{74} - \sqrt{73}$
- C.  $\sqrt{77} - \sqrt{76}$
- D.  $\sqrt{76} - \sqrt{75}$

Answer: Option C

Q6. The Range and the Standard Deviation of a data are R & S respectively. With the shift of origin of the data change(s) occur in the value(s) of:

- A. Both R & S
- B. Neither R nor S
- C. R only
- D. S only

Answer: Option B

Q7. A sum was lent to X for three years by an organisation who fixed a yearly rate of 10% compound Interest for repayment along with the condition of recovery in equal installments of Rs.31944. What percentage (correct to two decimal places) above the borrowed amount had X to pay the organization?

- A. 18.43
- B. 21.25
- C. 16.52
- D. 20.63

Answer: Option D

Q8. A retailer purchased 25 identical toys for a price Rs P and sold some of them for Rs P. If he calculated his profit as 8%, with selling price as base instead of cost price then how many did he sell?

- A. 24
- B. 20
- C. 21
- D. 23

Answer: Option D

Q9. The Table below presents the percentage marks obtained by three students A, Y, Z in the four components of assessment, A, B, C, D of a paper whose respective weightages are 4, 3, 2, 2, 1. Students/Marks A B C D X 78 85 72 76 Y 65 68 64 73 Z 82 76 81 75 What is the ratio of the average percentage of X in A, B to that of Y, Z combined in C, D?

- A. 324:283
- B. 326:293
- C. 28:25
- D. 81:73

Answer: Option D

Q10. A city water supply tank has two inlet pipes X and Y, which can fill it in 20 and 30 hours respectively, and an outlet pipe Z which can empty a full tank in 40 hours. If the tank is empty and the taps are opened in succession for one hour each, and the process continues, in how many hours will the tank get filled?

- A.  $49 \frac{1}{4}$
- B.  $51 \frac{3}{7}$
- C.  $49 \frac{1}{2}$
- D.  $49 \frac{1}{7}$

Answer: Option C

Q11. A sum of Rs.12500 is invested on 1st January 2016 at 4% simple interest p.a. How much interest in RS. gets accrued on the end of the day on 1st July 2016?

- A. 240
- B. 400
- C. 250
- D. 500

Answer: Option C

Q12. What is the real value of  $(0.000314 + 0.000198)^{(1/3)}$ ?

- A. 0.04
- B. 0.08

C. 0.8

D. 0.4

Answer: Option B

Q13. What is the simplified value of  $(10/15 \times 6)[22/2/5 \text{ of } [(64 - 2 \times 8) + 2]^{-2/5}$ ?

A. 6

B. 4

C. 5

D. 2

Answer: Option B

Q14. A man who has to walk 11Km, finds that in 30 minutes he has travelled two-ninth of the remaining distance. What is his speed in Km/h?

A. 4.8

B. 4

C. 4.2

D. 4.5

Answer: Option B

Q15. Six square plots are connected end to end to obtain a rectangular plot area 726 m<sup>2</sup>. If we take,  $\pi = 22/7$ , by what factor is the perimeter of this plot more than that of the circumference of a circle of radius 10m?

A. 1.45

B. 2.45

C. 2.1

D. 2.8

Answer: Option B

Q16. The mean and standard deviation of the data which is comprised of a set of ten positive numbers are 8 and 2 respectively. If the sum of squares of time along with ten numbers is 599. What is the tenth number?

A. 7

B. 8

C. 9

D. 11

Answer: Option C

Q17. With what value should the highest quantity in data

65, 52, 14, 26, 18, 35, 32, 38 be replaced so that the mean and median become equal?

A. 51

B. 66

C. 64

D. 53

Answer: Option D

Q18. A work is assigned to 6 men and 12 women and they could complete it in 3 days. It was also observed that together they can do 7 times as much work a man and a woman can do. In how many days would 14 women have done the work?

A. 10

B. . 6

C. 12

D. 9

Answer: Option D

Q19. If the HCF of 180 and 432 is expressed as  $(180m + 432n)$ , where  $m$  and  $n$  are integers, then what is the difference between  $m$  and  $n$ ?

- A. 3
- B. 7
- C. 9
- D. 8

Answer: Option B

Q20. If  $(x+10)\%$  of 240 is 60% more than  $x\%$  of 180, then 15% of  $(x+20)$  is what percent less than 25% of  $x$ ?

- A. 16
- B. 15
- C.  $15\frac{1}{2}$
- D.  $191\frac{1}{21}$

Answer: Option A

Q21. A sales representative's commission is 6% on all sales upto Rs.15000 and 5% on all sales exceeding this. He remits Rs.47350 to his company after deducting his commission. What were the total sales?

- A. Rs.49000
- B. Rs.47500
- C. Rs.50500
- D. Rs.50000

Answer: Option D

Q22. The sales (in multiples of hundred) of three brands A, B, C of car from a showroom during four consecutive years, 2012 - 2015 have been presented through the Bar Graph given below. In which year is the sale of A and B together is 125% of that of C? TCS NQT 2020 | 24th Oct 1 pm to 4 pm Slot Analysis

- A. 2013
- B. 2014
- C. 2015
- D. 2012

Answer: Option D

Q23. The List Price of an item was kept 40% above what the shopkeeper had paid to the manufacturer. On selling the item a profit of 8.64% was earned after allowing two successive discounts, the first one of which was 20%. What was the percentage of the second discount?

- A. 3.25
- B. 3.6
- C. 3.84
- D. 3

Answer: Option D

## VERBAL ABILITY

Q1. For the four sentence (S1 to S4) paragraph given below, sentences S1 & S4 are given. From the options P, Q and R, choose appropriate sentences for S2 & S3.

S-1: Some of the earliest currencies were objects from nature

S-2:

S-3:

S-4: They were similar in size, small and durable

P. Although they may seem a pretty random choice the shells had a number of advantages

Q. A notable example is cowrie shells first used as money about 1200 BCE R. Counterfeiting dates to the invention of money.

A.QP

B.RQ

C.PQ

D.PR

Answer: Option A

Q2. As it was his first job, Abhishek threw himself \_\_\_\_\_ it \_\_\_\_\_ a lot of enthusiasm. A. Into, with

B. At, with

C. Across, in

D. Over, from

Answer: Option A

Q3. Since sunrise to sunset my grandmother would sit by her wheel spinning and reciting prayers.

A. No error

B. My grandmother would sit by her wheel

C. Spinning and reciting prayers

D. Since sunrise to sunset

Answer: Option D

Q4. For the four sentence (S1 to S4) paragraph given below, sentences S1 & S4 are given. From the options P, Q and R, choose appropriate sentences for S2 & S3.

S-1: Eight months ago, it was business as usual at the cafe.

S-2:

S-3:

S-4: I checked the miniature circuit breaker and realized it had tripped:

P: Around six in the evening there was fluctuation and the lights went off.

Q: I pulled the miniature circuit breaker switch back and it was fine again.

R: The days were warm and so the air conditioners were in full force.

A. RP

B. QR

C. PQ

D. RQ

Answer: Option A

Q5. The Candidate \_\_\_\_\_ certificates the office could not verify were not permitted to appear before the interview board.

A. Whom

B. Whose

C. Who

D. Which

Answer: Option B

Q6 - Q8 Read the passage given below and answer questions. It's apparently humankind's fate never to stop writing the history of pandemics. No matter how often they occur—and they do occur with great frequency—we collectively refuse to think about them until circumstances demand it. Then, when the immediate crisis passes, we put it out of our minds as quickly as possible. And so we again are unprepared when the next contagion—in this case, COVID-19—bursts upon us. Richard Conniff traces this alarming cycle in “How devastating pandemics change us,” this month's cover story. It examines our long relationship with infectious diseases, from the hard lessons we've been forced to learn to the brave, and often difficult, characters who've risked their lives to save us. Smallpox taught us that we could prevent disease through inoculation and, as the 1700s ended, vaccination. By the mid-1800s, cholera's lesson was about sanitation and the need for centralized water and sewer systems. About the same time, one man we've all heard of, Louis Pasteur, and one many of us haven't, Robert Koch, became the co-fathers of germ theory. Tools they created are still used to identify and fight what Conniff calls “an astonishing rogues' gallery of deadly pathogens.” And yet here we are, again, fighting on two fronts: the first, against a new coronavirus sweeping the planet to devastating effect; the second, with each other, over domestic and international politics and whether we're willing to pay the price of prevention. It's an important question for our planet. While we debate, the next pandemic draws nearer. Q6. Which statement is CORRECT according to the passage?

- A. Research about vaccines is not reliable
- B. All pandemics are not to be feared
- C. Pandemics keep occurring periodically
- D. There is no solution for a pandemic

Answer: Option C

Q7. In the fourth paragraph which pandemic is the author referring? A. An unknown one B. Small pox C. COVID-19 D. Cholera Answer: Option A Q8. What does the writer imply that we should do? A. Be vigilant about hygiene and health issues. B. Wear masks when we step out of our homes. C. Wash our hands and everything we touch carefully. D. Maintain social distancing and avoid public gatherings. Answer: Option A Q9. The part of the sentence below may contain a grammatical error. Identify the part. A high-end machine was inaugurate at the city's Institute of Medical Sciences which will facilitate 3000 RT PCR tests for Coronavirus in a day.

- A. A high-end machine was inaugurate
- B. at the city's Institute of Medical Sciences
- C. for Coronavirus in a day
- D. which will facilitate 3000 RT-PCR tests.

Answer: Option A

Q10. Select the most appropriate option to complete the sentence. It was \_\_\_\_\_ a new experience for me to attend a Zoom meeting so I planned for it \_\_\_\_\_.

- A. reasonably, basically
- B. quite, carefully
- C. really, terribly
- D. surely, gently

Answer: Option B

Q11. The following sentence pair can be combined into a single sentence. Choose the sentence that best combines the two sentences without changing the meaning. Nikhil researched the topic well. He was able to do his Viva Voce well.

- A. Nikhil researched the topic well unless he was able to do his Viva Voce well.
- B. Nikhil was able to do his Viva Voce well despite he researched the topic well.
- C. Nikhil researched the topic well therefore he was able to do his Viva Voce well.
- D. Nikhil was able to do his Viva Voce well although he researched the topic well.

Answer: Option C

Q12. Which one of the following sentences uses formal language?

- A. This presentation takes the cake!
- B. Shall we put this on our agenda for the next client week?
- C. I apologize for the technical glitch that occurred during our webinar yesterday.
- D. I'm disappointed with the sales figures, they need to look up!

Answer: Option C

## REASONING ABILITY

Q1. Among 5 objects P,Q,R,S and T

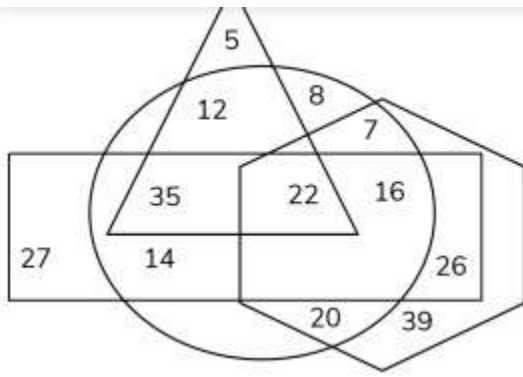
- i. R is twice as heavy as T
- ii. S is one and half times as heavy as Q
- iii. Q and R together weigh as much as S and T together
- iv. P and S together are one and half time as heavy as Q and T together

Which among the five is the heaviest of all?

- A. Q
- B. S
- C. P
- D. R

Answer: Option B

Q2.in the following diagram, the triangle stands for 'males', the circle for 'doctors', the rectangle for 'government employed', the hexagon for 'corona warriors'. The numbers in different segments show the number of persons for that segment. How many government employed doctors are either corona warriors or males or both?



- A. 22
- B. 73
- C. 35
- D. 38

Answer: Option B

Q3. A statement followed by two assumptions numbered I and II. Consider the statement and decide which of the given assumptions is implicit in the statement.  
Statement: Even though enough support is provided for potato production and its storage in cold stores, the state will continue to import from other countries

Assumptions:

- i. In Spite of the support the potato production and storage will not be able to meet the potatoes by the people in the store.
- ii. The state is aware that the demand for potatoes by the consumers would rise substantially in the near future.

- B. Only ii is implicit
- C. B. Both i and ii are implicit
- D. C. Neither i nor ii is implicit
- E. D. Only i is implicit

Answer: Option B

Q4. In a certain code,  $M + N$  means M is the son of N,  $M \times N$  means M is the brother of N;  $M \div N$  means M is the husband of N and  $M - N$  means M is the sister of N. If  $T - P + Q \times R \div S$ , then which of the following is true?

- A. P is the son of S
- B. Q is the uncle of T
- C. S is the sister of Q
- D. S is the aunt of T

Answer: Option D

Q5. A team of four players are to be selected from among four girls A,B,C,D and four boys P,Q,R,S such that there would be at least two girls in the team and the team selection should meet the following conditions

- i. B cannot go with R
- ii. D and P must go together
- iii. S cannot be put up with A



iv. R and C must be together

- A. QBSC
- B. DAPQ
- C. RCQS
- D. BPRA

Answer: Option B

Q6. Each of the five students, P, Q, R, S and T studies two subjects from the given subjects named History, Mathematics, English, Sanskrit, and Science. Each subject is studied by two students i. P studies Mathematics and Sanskrit

ii. R studies History and Mathematics

iii. S and T both study English

iv. Q does not study science Who from the given option studies science?

- A. P
- B. Q
- C. R
- D. S

Answer: Option D

Q7. A statement is followed by three assumptions numbered I, II and III. Consider the statement and decide which of the given assumption(s) is/are implicit in the statement. Statement: Punishment of students in any form by teachers is banned in all schools to preserve the selfconfidences of students.

Assumptions: I. Punishment in a mild form is not a cognizable offence in out-of-school as it is a method for disciplining children.

II. Teachers taking recourse to punishing children will be held accountable for their actions.

III. Punishment might induce fear, negatively affecting students' level of confidence and learning

- A. Only III is implicit
- B. Only I and II are implicit
- C. Only II is implicit
- D. Only II and III are implicit

Answer: Option A

Q8. 1600 employees are working in a company in four departments: Accounts, HR, Production and Sales, 20% of the employees are in Accounts with a male-female ratio of 5:3. 640 are working in Production where the number of males is twice the number of males of the Accounts Department. The number of HR employees is half the number of employees in the Accounts department and 60 of them are females.

The number of male employee in the Sales department is same as that of the Production department. How many female employees are working in the company?

- A. 600
- B. 540
- C. 400
- D. 500

Answer: Option D

Q9. Given below is a question followed by two statements, I and II, each containing some information. Decide which of the statement(s) is/are sufficient to answer the question. How is Sheela exactly related to Ramesh? Statements

II. Mary's brother Vikash is married to Sheela and Ramesh's mother is the sister of Mary.

III. II. Sheela is the sister of Vikash and Vikash's only child is the cousin brother of Ramesh.

- A. Both the statements I and II are necessary
- B. Both the statements I and II together are not sufficient
- C. Statement II alone is sufficient
- D. Statement I alone is sufficient

Answer: Option D

### PROGRAMMING LOGIC:

Q1. Which argument is passed to fflush()?

- A.no parameters
- B.stdin
- C.stdout
- D.stderr

Answer: Option B

Q2. What will be the output for the below? Enter your answer only as Numeral

```
public Class Main { public static void main(string[]) { int x=1/2; if(x==0.5)
System.out.println(x+1); else System.out.println(x*2); } }
```

 Answer: 0

Q3. What is the name of the method that examines a particular data entity and determines what data elements need to be associated?

- A. Entity relationship diagram
- B. Logic Data modeling
- C. Customer Entities
- D. Functional Primitive

Answer: Option A

Q4. What will be the output of the below code?

```
public class Main { static int num=30;
static class inner
{
void msg()
{
System.out.Println('Num: num++);
}
}
public static void main(string args[])
{
Main.Inner tw=new Main.Inner();
tw.msg()
}
}
```

Answer: 30

Q5. Select the correct code for opening a file for writing in binary mode

- A. File\*f =fwriteb("abc.bin")
- B. File\*f = fopen("abc.bin","bw")
- C. File\*f = fopen("abc.bin","wb")
- D. File\*f =fwrite("abc.bin","b")

Answer: Option C

Q6. What will be the output of the below code?

```
import java.util.ArrayList;
import java.util.Collections;
import java.util.Iterator;
class MainClass
{
    public void sort()
    {
        ArrayList arrayList= new ArrayList();
        arrayList.add("mango");
        arrayList.add("grapes");
        Iterator iterator = arrayList.iterator();
        while(iterator.hasNext())
        { System.out.print(iterator.next() +" ");
        }
        Collections.sort(arrayList);
    }
}

public class Main { public static void main(String[] args)
{
    MainClass mainclass = new MainClass();
    mainclass.sort();
}
}
```

- A. mango grapes
- B. Compilation error
- C. Collection.sort() throws Concurrent Modification Exception
- D. Grapes mango

Answer: Option A

Q7. What is the name of the method that examines a particular data entity and determines what data elements need to be associated with it?

- A. Customer Entities
- B. Entity Relationship Diagram
- C. Logic Data Modelling
- D. Functional Primitive

Answer: Option B

Q8. We cannot overload \_\_\_\_\_ operator

- . A. ::
- B. []
- C. ()
- D. +

Answer: Option A

Q9. Which of the following functions is used to accept strings with white spaces?

- A. getWhiteSpaceString();
- B. scanf();
- C. gets();
- D. getstrings();

Answer: Option C

Q10. Which data structure is used to convert expression from one form to another form? A. Graph

- B. Stack
- C. LinkedList
- D. Queue

Answer: Option B

Q11. What is the mathematical function used to round off 6.23 to 7?

- A. floor(6.23)
- B. ceil(6.23,7)
- C. floor(6.23,7)
- D. ceil(6.23)

Answer: Option D

Q12. Which combination of the integer variables a, b and c makes the variable m get the value 4 in the following expression?  $m = (a > b) ? ((a > c) ? a : c) : ((b > c) ? b : c)$

- A. a=6, b=3, c=5
- B. a=6, b=5, c=3
- C. a=5, b=4, c=5
- D. a=3, b=4, c=2

Answer: Option D

Q13. Which of the following options best suits for 'Memory Leak Occurred'?

- A. Resource allocation pending while debugging the code
- B. Program releases resources allocated in the memory
- C. Program does not free the memory which is allocated dynamically
- D. Occurs due to address assignment failure.

Answer- Option C

### **CODING:**

Q1. WASHING MACHINE A Washing Machine works on the principle of a Fuzzy system, the weight of clothes put inside it for wash is uncertain. But based on weight measured by sensors, it decides time and water levels which can be changed by menus given on the machine control area. For low Water level, time estimate is 25 minutes, where approximate weight is 2000 grams or any non-zero positive number below that.

For Medium Water level, time estimated is 35minutes, where approximate weight is between 2001 grams and 4000 grams. For High Water level, time estimated is 45 Minutes, where approximate weight is above 4000 grams. Assume the Capacity of the Machine is maximum 7000 grams. Where the approximate weight is zero, the time estimate is 0 minutes. Write a function which takes numeric weight in the range [0,7000] as input and produces estimated time as output; if input is more than 7000, then output is: "OVERLOADED!", and for all other inputs, the output statement is "INVALID INPUT".

Input should be in the form of integer value –  
<integer>

Output must have the following format - TimeEstimated: Minutes TCS

Example 1

Input Value

2000

Output Value

Time Estimated: 25 Minutes

```
1 #include<iostream>
2 using namespace std;
3 int main()
4 {
5     int weight;
6     cin >> weight;
7     if(weight < 0)
8         cout << "INVALID INPUT";
9     else if(weight == 0)
10        cout<<"Time Estimated : 0 Minutes";
11     else if(weight > 0 && weight <= 2000)
12        cout << "Time Estimated : 25 Minutes";
13     else if(weight >= 2001 && weight <= 4000)
14        cout << "Time Estimated : 35 Minutes";
15     else if(weight >= 4001 && weight <= 7000)
16        cout << "Time Estimated : 45 Minutes";
17     else
18        cout << "OVERLOADED!";
19     return 0;
20 }
```

Q2. Caesar Cipher The Caesar cipher is a type of substitution cipher in which each alphabet in the plaintext or message is shifted by a number of places down the alphabet.

For example, with a shift of 1, P would be replaced by Q, Q would become R, and so on.

To pass an encrypted message from one person to another, it is first necessary that both parties have the 'key' for the cipher, so that the sender may encrypt it and the receiver may decrypt it.

the key is the number of OFFSETs to shift the cipher alphabet. Key can have basic shifts from 1 to 25 positions as there are 26 total alphabets.

As we are designing custom Caesar Cipher, in addition to alphabets, we are considering numeric digits from 0 to 9. Digits can also be shifted by key places.

For example, if given plain text contains any digit with value 5 and key = 2, then 5 will be replaced by 7. "-" (Minus sign) will remain as it is. Key value less than 0 should result into "INVALID INPUT"

Example 1:

Input:

Enter your PlainText: All the Best

Enter the Key: 1

Output:

The encrypted Text is: Bmm uif Cftu

Write a function customCaesarCipher(int key, String message) which will accept plaintext and key as input parameters and returns its cipher text as output.

```
1 #include<stdio.h>
2 void customCaesarCipher(int key,char str[]);
3 int main()
4 {
5     int key;
6     char str[100];
7     scanf("%[^\\n]s",str);
8     scanf("%d",&key);
9     customCaesarCipher(key,str);
10    return 0;
11 }
```

```
12 void customCaesarCipher(int key,char str[])
13 {
14     int n=0,i=0;
15     for(n=0;str[n]!='\\0';n++);
16     if(key<0){
17         printf("INVALID INPUT");
18         return;
19     }
20     else{
21         for(i=0;i<n;i++){
22             if(str[i]!=' '){
23                 if(str[i]>=65 && str[i]<=90){
24                     if(((int)(str[i]+key)<=90)
25                     str[i] = (int) (str[i]+key);
26                     else
27                         str[i] = (int)(str[i]+key-90+65-1);
28                 }
29                 else if(str[i]>=97 && str[i]<=122){
30                     if(((int)(str[i]+key)<=122)
31                     str[i] = (int) (str[i]+key);
32                     else
33                         str[i] = (int)(str[i]+key-122+97-1);
34                 }
35                 else if(((str[i]>=48 && str[i]<=57)){
36                     if(((int)(str[i]+key)<=57)
37                     str[i] = (int)(str[i]+key);
38                     else
39                         str[i] = (int)(str[i]+key-57+48-1);
40                 }
41             }
42         }
43         printf("%s",str);
44     }
45 }
```