**Answers for CEED 2017 PART-A**

1) 18

To avoid confusion, just write down the animal names in a rough paper.

tortoise, leopard, mouse, rabbit, dog, crocodile, hen, rhino, monkey, Ram, elephant, horse, snake, Ox, whale, cat, snail, camel

now you see how many you have.

2) 56

As seen i nthe rectangle which has been extruded, we see that since the shape has 4 sides (4 sides of the rectangle), we have 4 extrusions of the wall. So, the key is finding the no. of walls/sides of the given shape. In the below image, I've marked the sides.
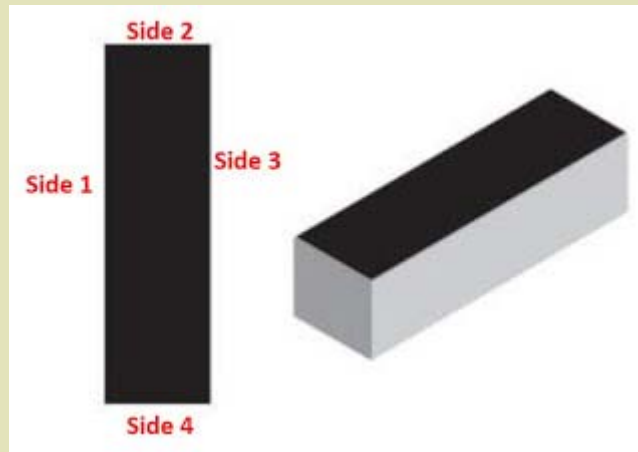
Considering the given weird shape, as beIng made of set of six 'Y' shapes with a center solid circle. Now, as shown in the below image, trying the count the number of sides of the shape will result in the following total
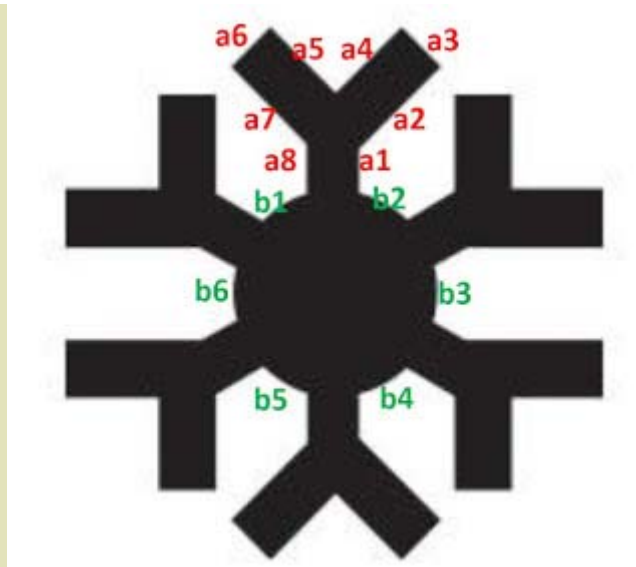
No. of Y shapes = 6
No. of sides for each 'Y' shape = 8 (marked from a1 to a8)
No. of extrusion for the six Y shapes = 6*8 = 48
No. of sides for the circular part = 6 (marked from b1 to b6)
Now that we have counted the no. of side extrusions, we are left with a surface at the top and another surface at the bottom, accounting to 2 no's
So, total no. of surfaces after extrusionn = 48 + 6 + 2 = 56

3) 6

In each square, if we multiply the bottom 2 numbers we will end up getting the number given i nthe topb boxes. For ex., consider the first box, bottom multiplied no. = 6*6 = 36, which is given in the top rows of the box. Similarly in the fourth given pattern, 9*4 = 36, so, 6 is the answer.

4) 4

After the cut square portion of 3sm side is removed, all the four regions in the leftover part are of same shape and size. So, the area of the shaded part is 1/4th of the area of the leftover piece.

Actual Area of the square = 5*5 = 25
Area of the cut square of side 3 cm = 3*3 = 9
area of the leftover = 25-9 = 16
Area of the shaded part = 16/4 = 4 cm square centimeters

5) 12

As you can see in the below image, from west we can take any three starting points, marked as R1, R2 and R3. Considering only R1, we have four possible routes as shown by lines in different colors. Similarly, from R2 and R3, we can go in 4 diff routes from each start position. So, total possible rooutes are 4*3 = 12
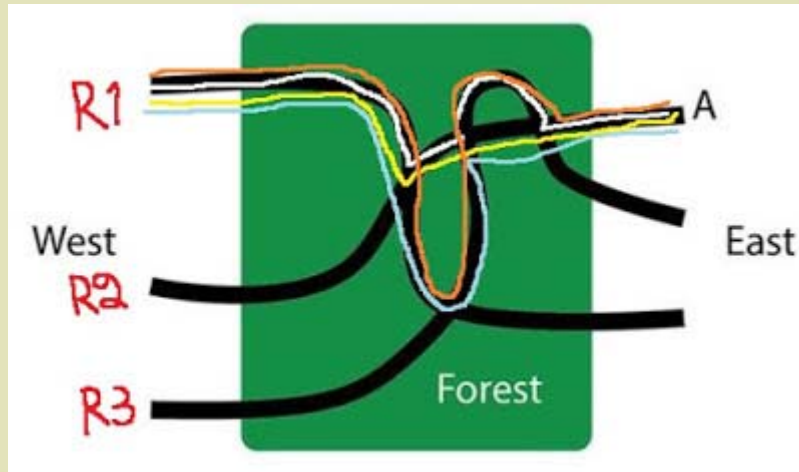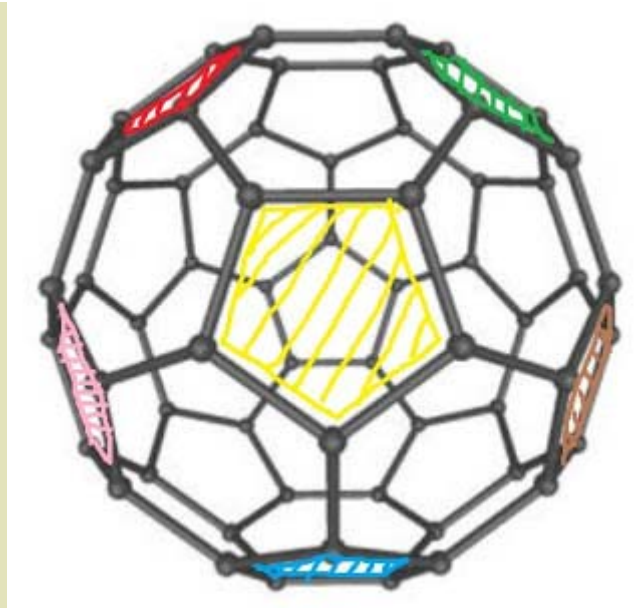
6) 12

To avoid confusion, I've marked the pentagons on the back side and front side of the 3D solid separately.

Pentagons on the backside
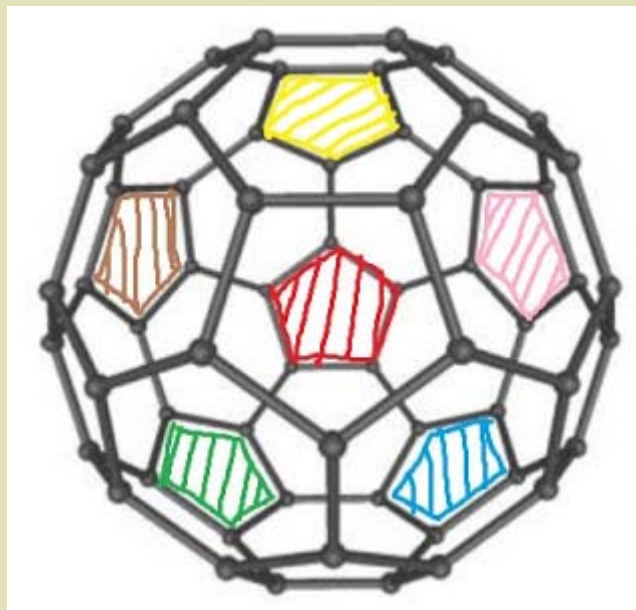
Pentagons on the front side

7) 114

Considering only the bottom most row with al lthe cubes in place, we can say

No. of total cubes = 8 rows X 8 columns = 64 cubes
so, we can say that 32 cubes are white and 32 are blue.

Considering second layer of cubes (from bottom), we observe that 4 cubes (even no.) are missing, so considering 2 as white and 2 as blue, we have the total no. of blue cubes = (32 - 2) = 30 cubes

Considering the third layer of cubes (from the bottom), we observe that 5 cubes (odd no.) are missing and since white cubes are visible at the edges, we can deduce that more no. of blue cubes are missing, so, we take 3 blue cubes out of 5 missing cubes. So, total no of blue cubes in the third layer = 32- 3 = 29

Considering the top layer (fourth layer), 16 cubes are missing, and again since white cubes are more visible at the edges, we consider more no. (16/2+1=9) of blue cubes missing, so blue cubes missing and so, no. of blue cubes available = 32 - 9 = 23

Finally, total no. of blue cubes in the structure = 32 + 30 + 29 + 23 = 114
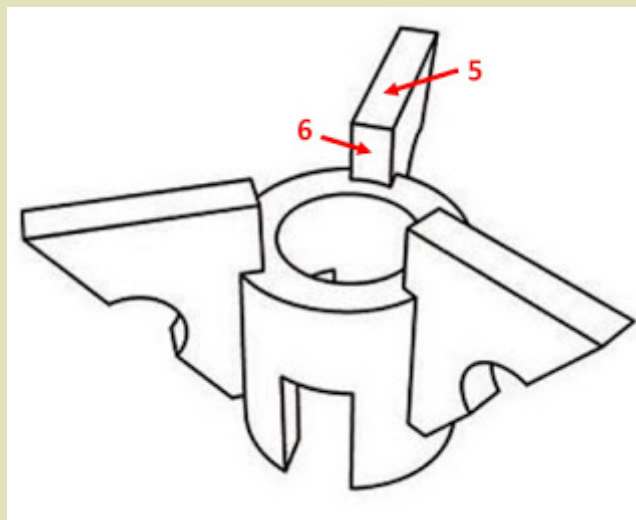
8) 39

Considering only one of the extended part, and as is clear from the below picture
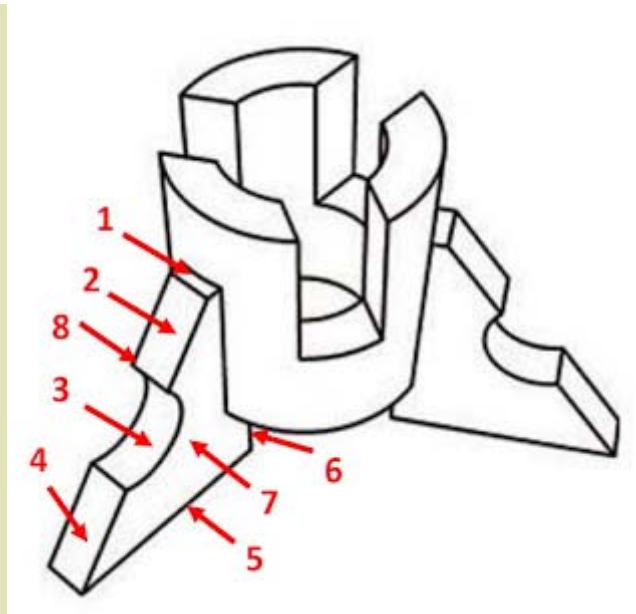
No. of surfaces for each extra part = 8
No. of surfaces considering three parts = 8*3 = 24

If you're confused on the surfaces numbered 5 and 6 in the above picture, below picture might help you. Those surfaces are visible in different view.

Now, considering the central cylindrical cut part. As shown in the below image, you can visualize the top of the shape as being one flat surface marked as one in the below picture. Note that it is continuous as no breaks are visible.

Now, consider the bottom view of the above image, will look like the below image, try to identify the surfaces made by the central cut cylindrcal portion. You may not be able to view all the surfaces as numbered by me in the image but just remember that the pattern formed by surfaces 1,2,3,4 (which are cleearly visible) repeat itself two more times (5,6,7,8) and finally (9,10,11,12).
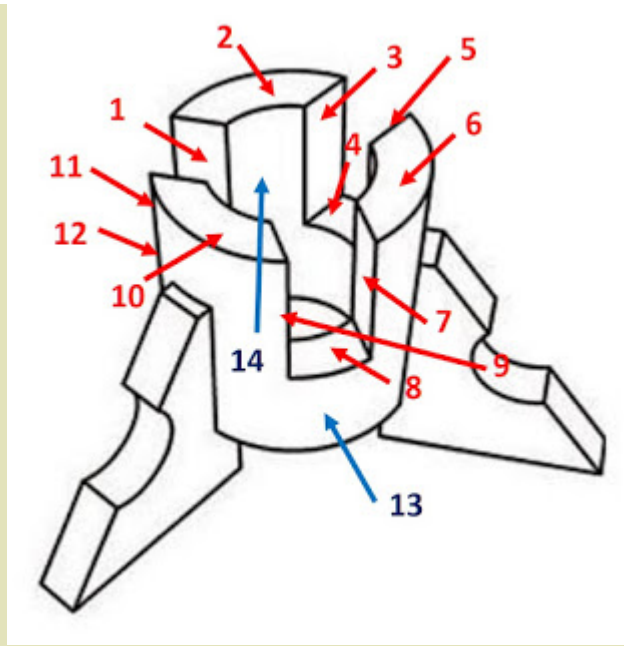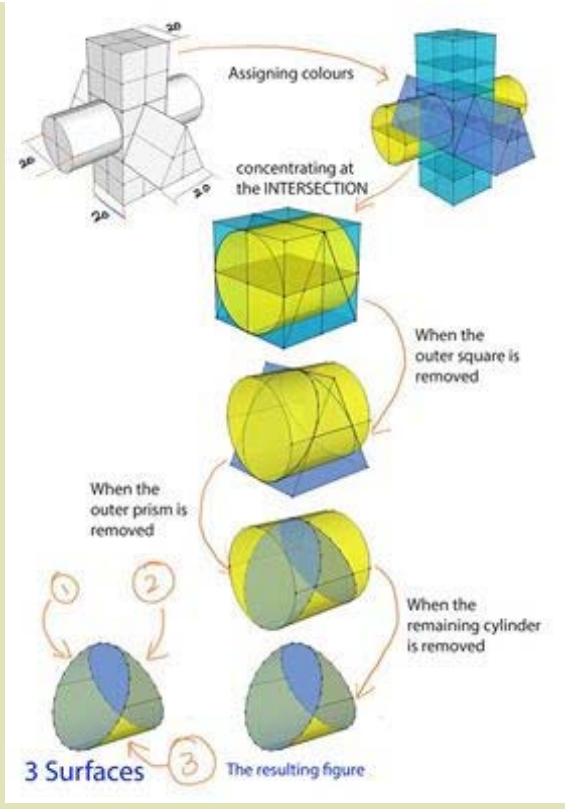
The outer surface is again continuous and hence to be count as one surface, like wise inner surface adds to one surface

Total no. of surface = 24+1+12+2 = 39

9) 3

Thanks to Bhaskar Komara for sharing with us the detailed answer. He has out effort in making this.

Basically, the question is asking about the number of surfaces of the solid formed by the intersection of the given set of solids.

Additionally, check the below image for finding the number of surfaces

I have shown the no. of surfaces in the front direction only which will be 5.
Since the shape is symmetry, no. of surfaces from the backside = 5
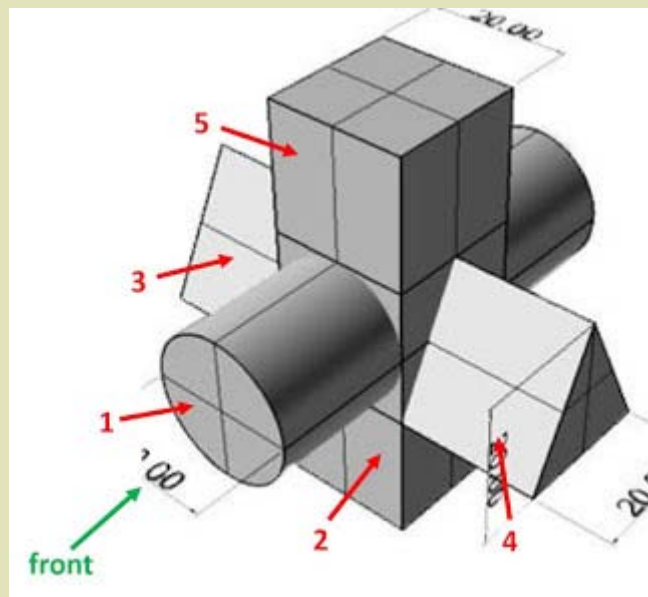
No. of surfaces viewed from right side (considering cylindrical surface) = 5
No. of surfaces viewed from left side = 3
No. of surfaces in top view= 1

No. of surfaces in bottom view = 3
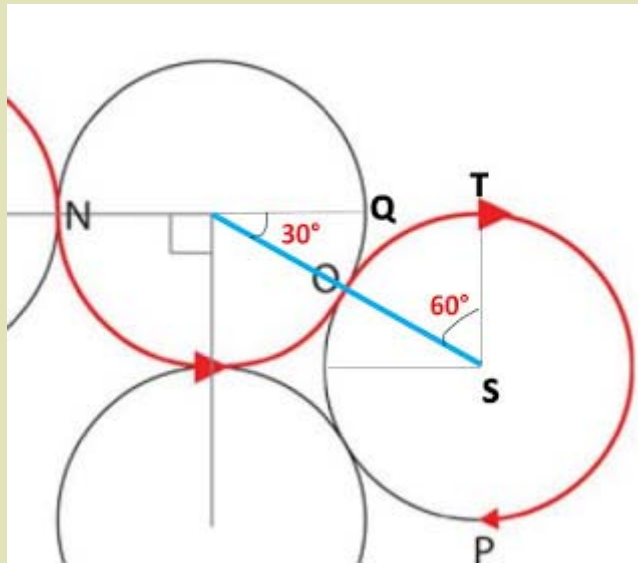
Total No. of surfaces = 5+5+5+3+1+3 = 22

10) 250.996

Length LR = Length MR = Radius of the circle = 42/2 = 21
Length MN = Half of the circumference of the circle = 2*PI*r/2 = PI*r = (22/7)*21 = 66
Length NO = Half circumference - Length of the arc OQ = PI*r - r*theta = 66 - 21*(30*PI/180) = 55.004 (approx)

note that 30 degree angle been convereted into radian which will be 30*PI/180 since 2*PI radians makes 360 degrees.

Similarly,
Length OP = Half circumference + Length of arc OT = 66 + r*theta = 66 + 21*(60*PI/180) = 87.992 (approx)

So, total length = 21 + 21 + 66 + 55.004 + 87.992 = 250.996

11) A,D

I'm arraging the given relations like following

Bulls > snails (1)
cats < bulls (2)
snails > dogs (3)
dogs < bulls (4)
cats > snails (5)

arraning them in ascending order

bulls > cats > snails > dogs

A. cats move faster than bulls is false since it is opposite to (2)
B. Dogs move slower than cats is true according to the above arrangment. Infact dogas are the slowest of all sccording to all the statement
C. Bulls move faster than dogs is false according to (4)
D. Bulls move slower than cats is false according to the arrangement above

12) A,C

It's obvious that all the given part logo's belong to Indian banks. So, A, B and C suits. But observe that the SBI logo given in the option is not correct since it should have a circle in the middle and not rhombus. A being canara bank logo and C being the logo of HDFC bank, so they are the required options.

13) B,C

Blind spot is a particular part of human eye and is nnotassociated with color perception.

An afterimage is an image that continues to appear in one's vision after the exposure to the original image has ceased. This is nothing but an illusionary view on our eyes after prolonged view of something.

INter-ocular distance is the distance between the centers of rotation of the eyeballs of an individual or between the oculars of optical instruments, which has nothing to do with color perception.

14) A,B,C,D

All the shapes can be obtained

**15) A,C**

Check this on how to visualize solids -

16) A, B, D

A cantilever is an arrangement of the metal (say a bar/rod etc) such that it overhangs as shown in the below picture. I've drawn an image showing how A can be tilted such that there are no overhanging elements. You cna visualize similarly and check for B,C,D. Note that C has some sort of cantilever form in all the tilt positions.
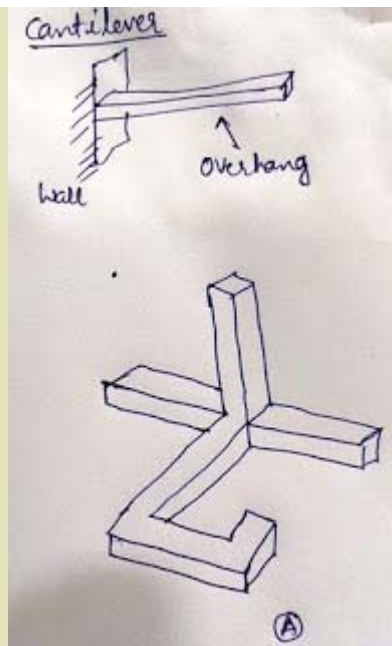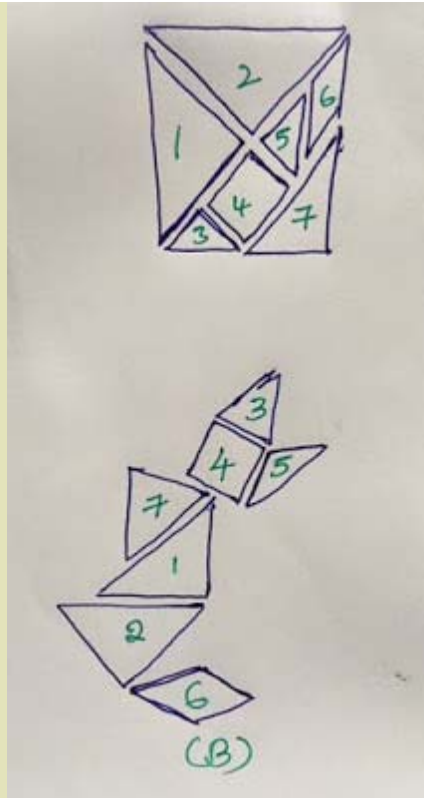
17) A,B,C
by observation

18) B, C

All the options has al lthe shapes given in the cut shape, but the key is to find the right size and shape of the cut pieces. For ex., If you closely observe otion A and B, both looks same, but part no. 6 is smaller in size in option A.

I've shown the image for option B, try for option C also and see if you can spot the pieces.

More resources and guide for 'Tangram puzzles' are avilable in **CEED/UCEED resource page** - 1.

Some online sites for similar questions

Tangram puzzles 1
Tangram puzzles solution 1
Tangram puzzle 3

19) B, D

Check here about painters, artists - **SYL Resource about GA**

**Study on list of famous designers**

20) A,B,D

Manthan, Bhumika, Nishant - Shyam Benegal
Droh Kaal - Govind Nihalani

(I hate this kind of general questions :P, Don't know how this going to help in design :P)

21) D

As shown in the below figure, I used the base landing profile to figure out the shape of 'a' that is of same font kind as the given word. Observe the 'V' kind of landing and the one that is marked in green arrow. Only option D matches.
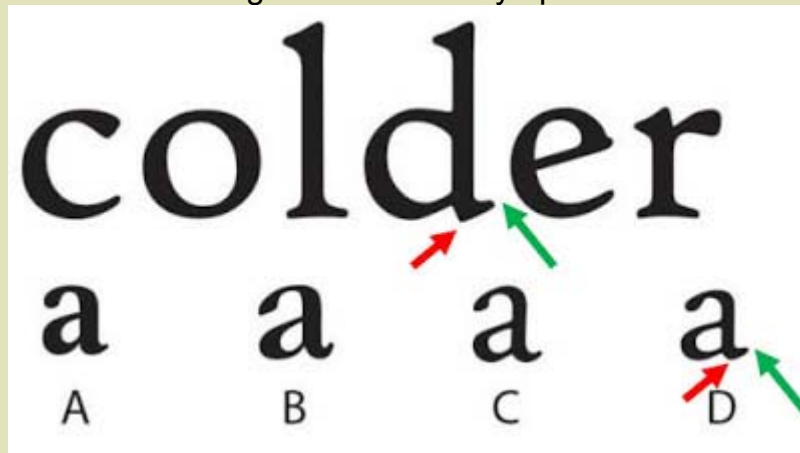
22) B

(Just took from key, I'm not sure who told this :D)

**23) B**

Observe the pattern that I showed in red boxes. As you can see they repeat the pattern everywhere the given set of symbols. Based on that, we note that empty triangles are positioned above the dark filled triangle, which is again above the dark filled squasre. Shoe, the two question marks highlighted by blue rectangle should have two empty triangles. Only option B has that
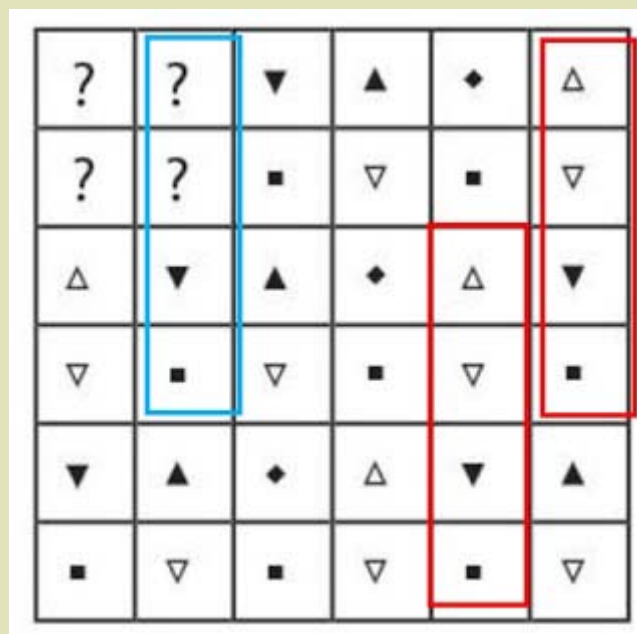
24) A

As shown in the below image, If the ant starts at the top (Point X) and wraps around and reaches the point Y (which is vertically below X), and if we assume that we cut the cylinder along XY line and unfold it, we will see that the unfolded cylinder will becoma a rectangle and the path of thr ant will be along the diagonal straight line conencting A and B, as shown in figure.
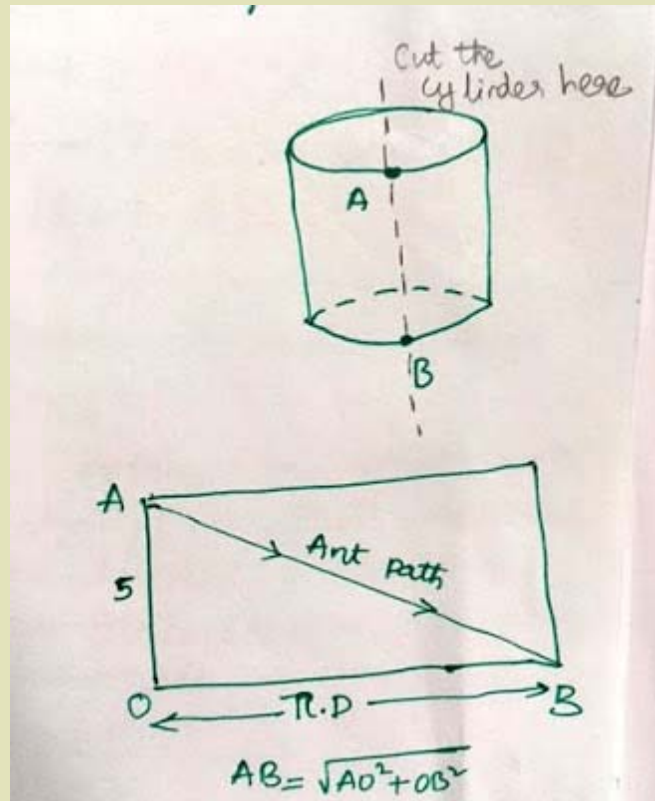
Length of OB = circumference of circle of diameter 5 cm = 2*PI*R = PI*D = PI*5

According to pythogorous theorem,
Length of AB = square root of(AO square + OB square)
= square root of(5 square + PI*5 square) = square root of(25 + 25*PI^2)

25) D

Given CAT ~ BES

observe each alphabet in both sides, (C,B) (A,E) and (T,S)
C comes next to B, and T comes next to S
Also, we know that vowels are (A,E,I,O,U) so the pair (A,E) is the consequtive vowle alphabets in the list of vowels

now for the second coondition,

DOG ~ CUF
observe each alphabet in both sides, (D,C) (O,U) and (G,F)
D comes next to B, and G comes next to F

Also, we know that vowels are (A,E,I,O,U) so the pair (O,U) is the consequtive vowel alphabets in the list of vowels

SO KIN ~ ?
K comes next to J, so the first alphabet should be J, similarly N comes next to M, so the last alphabet is M. The middle alphabet is given as I, in the vowel list a,e,i,o,u, O is the next alphabet to I,
So, the required word is
JOM

26) B

27) C
Most of the regularr/general used engines (like TVS, Hero, Bajaj) have single cyclinder. Only big and heavy motorcycles that needs large power/torque (including race bikes) need multiple cylinders.

28) A

For more about the other symbols, check this pdf

A complete intro to DSLR camera settings and buttons

29) C

As you can see in the below image, View Y is obtained when you rotate about the shown axis, around 180 degrees. So, the following has to be observed
1. Back face of view X is the front face of view Y
2. front face of view X is the back face of view Y
3. Right face of view X is the left face of view Y
4. Left face of view X is the right face of view Y
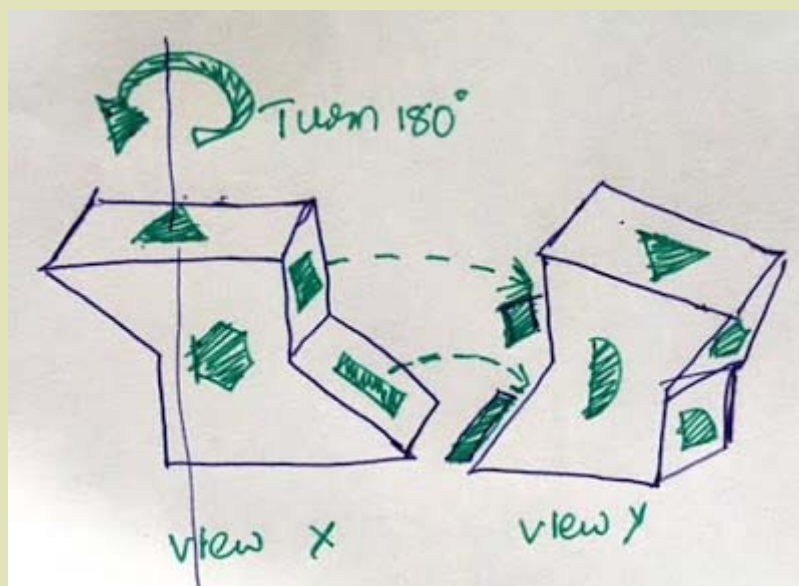
So, as shown by arrows, the square and the rectangle shapes on the right face of the view X, should be on the invisible surface (eft side) of view Y.

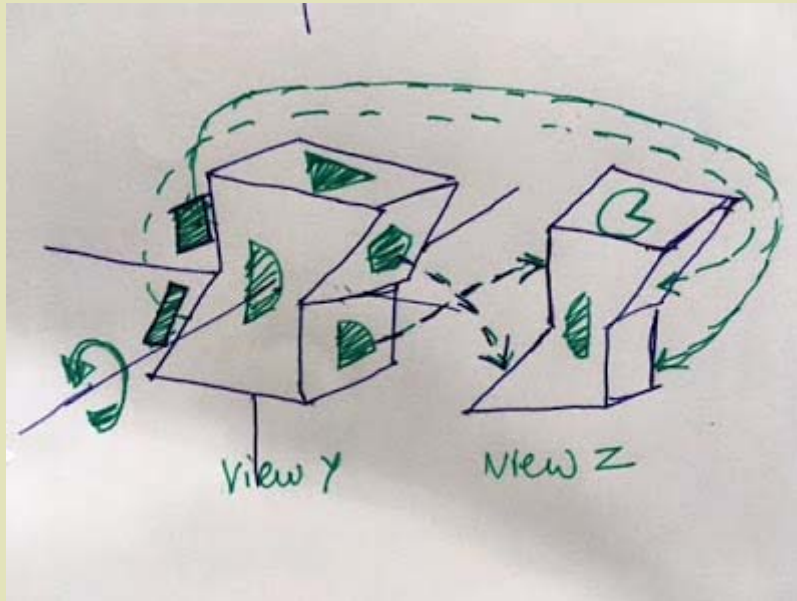Now If you closely observe view Y and Z, the semi circle on the front face of Z is just flipped as that seen in Y. So, it means that Z is the rotated view of the Y (180 degrees) as shown in figure. So, the left side of View Y is the right side of the view Z, but note that the upper part of left Y will now be at the lower section of the right Z. This is shown with dotted line arrows.

30) B

For paper fold and cutting kind of questions, the best way is to move in reverse order - I mean by way of unfolding and mirroring the cut pattern along the line of fold/unfold. Note that unfolding is just the reverse of how it was folded, which you can compare the compare in the question and what I drew below.
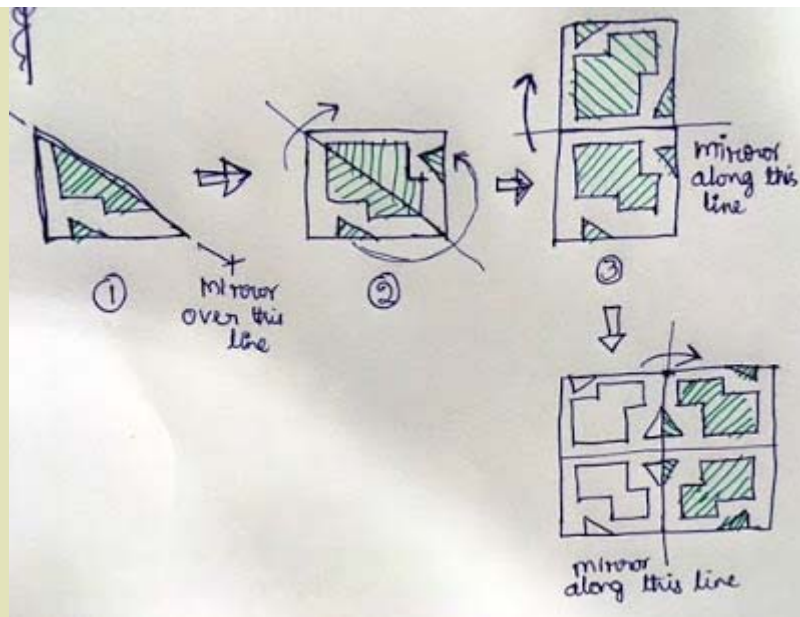
31) A

List of Thomas A Edison's inventions - Phonograph, The Electrographic Vote Recorder, Motion Picture device, Magnetic Iron Ore Separator, many patents related to Telephonic telegraphs,

Kirkpatrick Macmillan is with inventing the pedal driven bicycle.

Elisha Graves Otis was an American industrialist, founder of the Otis Elevator Company, and inventor of a safety device that prevents elevators from falling if the hoisting cable fails.

George Eastman was an American entrepreneur who founded the Eastman Kodak Company and popularized the use of roll film, helping to bring photography to the mainstream. Roll film was also the basis for the invention of motion picture film in 1888 by the world's first film-makers Eadweard Muybridge and Louis Le Prince

Source: wikipedia

32) C

Height of the wall = 10 feet

first attempt
Distance travelled by the green lizard = 3 - 1 = 2 feet
whereas, distance travelled by the red lizard = 4 -2 = 2 feet

So, in each attempt, both will have climbed the same distance.

fourth attempt

height touched by the green lizard = height reached by previous three attempts + maximu height it can reach = 2*3 + 3 =9,
although the green lizard has tried to move 3 feet, since it has not reached the top, it will slip by 1 feet, and so the net height reached by it is 9-1 = 8feet

In fourth attempt of red lizard,
height touched by the red lizard = height reached by previous three attempts + maximum height it can reach = 2*3 + 4 =10,

So, in the fourth attempt, it can reach the top of the wall and so there is no notion of slipping.

33) B

This is similar to tessellation problem. The best way is to find this is: at each step, try folding each surface to form back a cube and see in each folding, whether the red line is the folded surface is in line (at the same point) with the red line of the surface to which the current folded surfaces closes.

As an example, check the below image for option A, and notice that keeping surface 2 on the floor, if I try to fold surface 1 and surface 3, both will stand up right making contact at the edge denoted as 'a' circled. So, for the line to be continuous, the distance d1, and d2 should be equal, otherwise both won't be along the same point of the contact edge. Hope you got this. In option A, as you can see, it is straight forward that d1 is not equal to d2, and so we conclude that it is not correct.
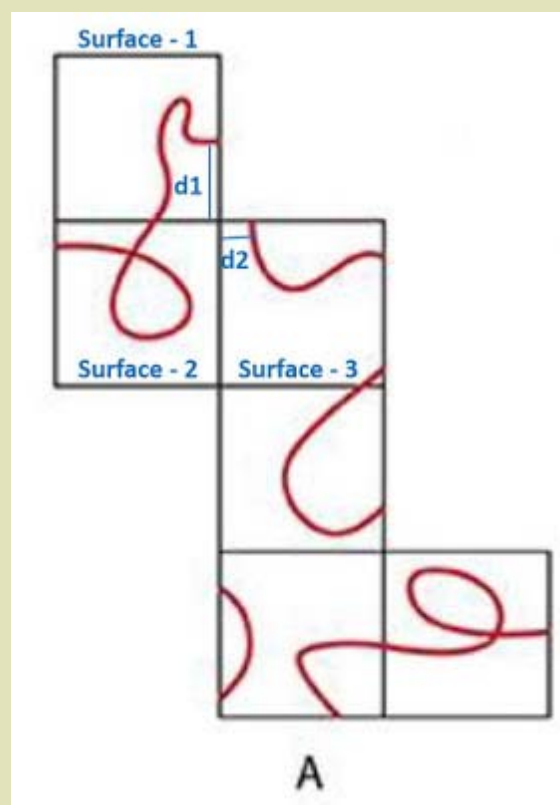
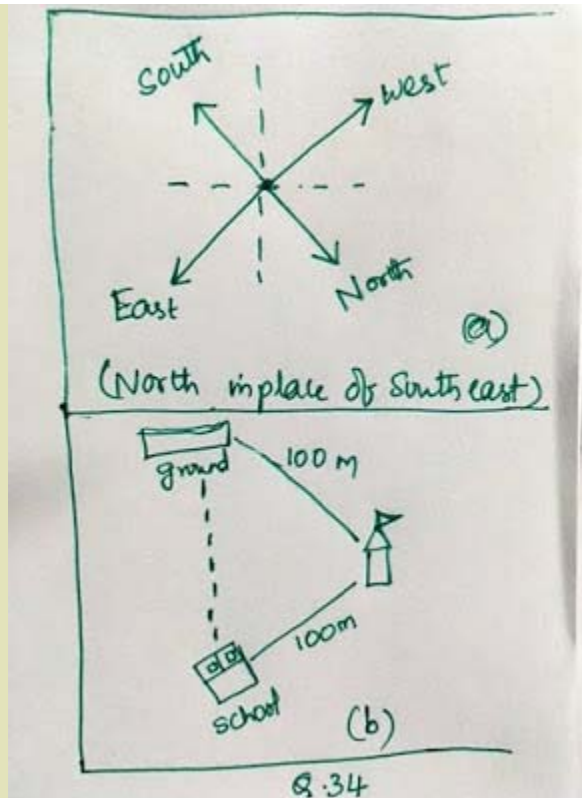While checking the other options, instead of finding for correct match, try to find a MIS-MATCH, which will save your time for solving. Hope you understood this.

C
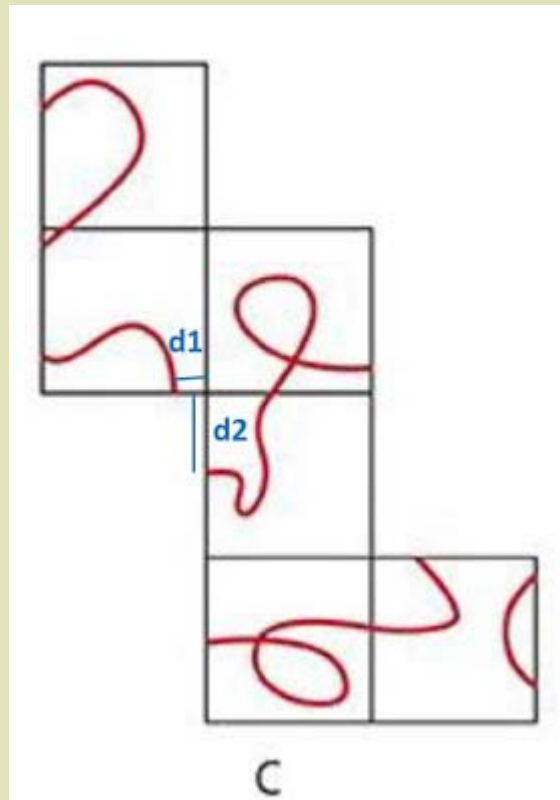
34) A

As can be seen in fig (a) below, if North is mistaken as being in south east direction, then the rest of the major directions will be as shown in the figure (a).

As per their given statement, if I position school and play grround 100 meter each along east and south directions, then the playground end up in straight vertical upwards from school as shwon in fig (b)

35) A

Note that the links DH, DG, OD, OB, BG, are all equal. Assume that ends A and C are moved simultaenously with equal angles. If A is held and turned anti clockwise direction, then it is dragginb B to the left, which again drags G to the left. Similarly if we hold C and turn it clockwise direction as shown in the question, then we are trying to drag D to the left (just like A did with B), which again tries to drag G to the left. So, assuming equal movements of A and C, and since lengths are equal, it is clear that G tends to be dragged towards O, alongg the horizontal line joining both. Similarly H tends to move down along the vertical line through O.

36) A

More about colours can be found on **this resource page** -

37) B

You observation should be on the thumb finger first to help in recognizing the mistake quickly. If the yellow guy is standing to the left and is hifying with his right hand, then then thumb should be on the left to his hand, right ? Thus, option C is out from the list.

The blue guy is facing him and is hifying with his right hand, so according to his standing position, his thumb should be to the right according to what we view. So, only option B suits.

38) C

This is very straight forward observation question, in each step, the pattern gets rotated clockwise to 45 degrees as is clear in the below picture. To understand this just take one square out of the five square parts in the first pattern, and start how it is moving in the next two steps.
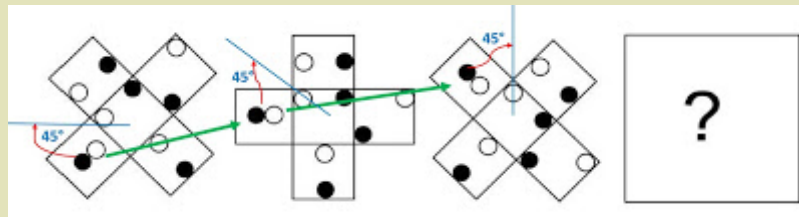
39) C

Additional information about the painters, copied from wiki FYR

Vincent Vangogh - was a Dutch Post-Impressionist painter who is among the most famous and influential figures in the history of Western art. In just over a decade he created about 2,100 artworks, including around 860 oil paintings, They include landscapes, still lifes, portraits and self-portraits, and are characterised by bold colours and dramatic, impulsive and expressive brushwork that contributed to the foundations of modern art.

Paul Gauguin was a French post-Impressionist artist. Underappreciated until after his death, Gauguin is now recognized for his experimental use of color and Synthetist style that were distinctly different from Impressionism. His work was influential to the French avant-garde and many modern artists, such as Pablo Picasso and Henri Matisse. He was an important figure in the Symbolist movement as a painter, sculptor, printmaker, ceramist, and writer. His bold experimentation with color led directly to the Synthetist style of modern art, while his expression of the inherent meaning of the subjects in his paintings, under the influence of the cloisonnist style, paved the way to Primitivism and the return to the pastoral. He was also an influential proponent of wood engraving and woodcuts as art forms.

Rembrandt was a Dutch draughtsman, painter, and printmaker. An innovative and prolific master in three media, he is generally considered one of the greatest visual artists in the history of art and the most important in Dutch art history. Rembrandt's works depict a wide range of style and subject matter, from portraits and self-portraits to landscapes, genre scenes, allegorical and historical scenes, biblical and mythological themes as well as animal studies. His contributions to art came in a period of great wealth and cultural achievement that historians call the Dutch Golden Age. Rembrandt's portraits of his contemporaries, self-portraits and

illustrations of scenes from the Bible are regarded as his greatest creative triumphs. Rembrandt's foremost contribution in the history of printmaking was his transformation of the etching process from a relatively new reproductive technique into a true art form, along with Jacques Callot.

40) A

Arranging R n top of P, and by careful observation and comparison iwth S, we can deduce that A is the required pattern.

41) C

There are usually 24 frames per second in a film. So, for a min, the number of frames would be 24*60 = 1440. Goven that in one minute, it took 90 feet projection of the film.
90 feet projection -> 1 min -> 1440 frames
90 feet projection -> 1440 frames

So, dividing both sides by 90,
1 foot projection -> 1440/90 frames
which is 16 frames

In 1 min, 90 feet of film is projected,

42) A

Fitts's law is a predictive model of human movement primarily used in human–computer interaction and ergonomics. This scientific law predicts that the time required to rapidly move to a target area is a function of the ratio between the distance to the target and the width of the target.

So, according to this law, for lesser time requirement, the distance to the target should be less and the width of the target area should be more. In the module X, when we press the letter 'Sa' in hindi, the circular menu pop up which was arranged such that all the variants of that letter are near to the center and the width/space occupied by them is more, compared to the configuration shown in Y, in which some of the letters are far from the initial touch position, and the width/space occupied by the variants are very less.
So ,time when operaton module X will be comparitively less.

43) A

When the ball is released fr omthe top, it rolls, reaches P and then due to inertia and the potential energy saved in it, it tires to continue along the curve, but the energy it has in storage is not sufficient to make it cross the contour, and hence the ball tend to osciallte along the curve on both sides until it comes to a halt at P.

44) B

If you turn the given word 180 degrees, then you will see the same word.

Palindrome - A palindrome is a word, phrase, number, or other sequence of characters which reads the same backward as forward, such as **madam** or **racecar**.

An ambigram is a word, art form or other symbolic representation whose elements retain meaning when viewed or interpreted from a different direction, direction, perspective, or orientation.

Example images of Ambigram

I'm not sure about the rest two names, I think they picked the names randomly.

45) A

Since subject A appears to the right, the camera which is placed over-the-shoulder should be to the left relative to the person (A). So, camera 2 is the required. Similarly since subject B needed to be to the left, the camer should be right to B, so, camera 3 suits the requirement