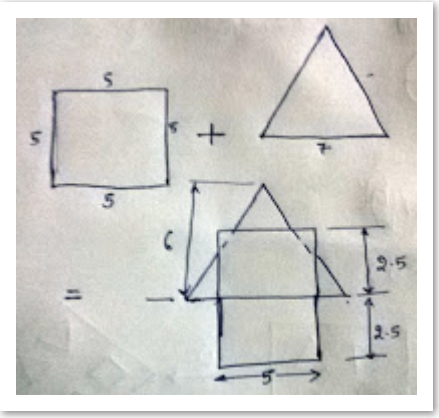
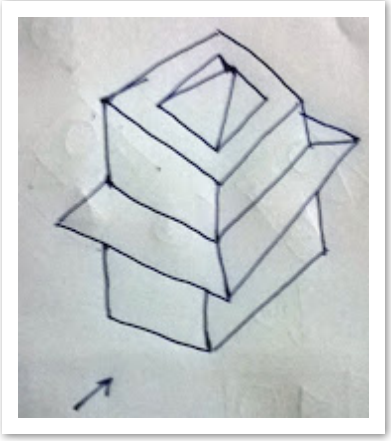
Section A: NAT

1) 19

We know that a pyramid has a base and triangles connecting the base sides and a common point. Usually the base is square. In the given question, pyramid base size (7cm) is greater than the size of the cube (5cm). So, some part of the pyramid will protrude out. Picture below shows the pre step of adding the shapes.



Below image shows the 3D view of the solid formed after joining. Sorry for the poor drawing, but hope you can visualize that. Note that the top portion is also a small sized pyramid shape. As can be seen the shape is in symmetry.



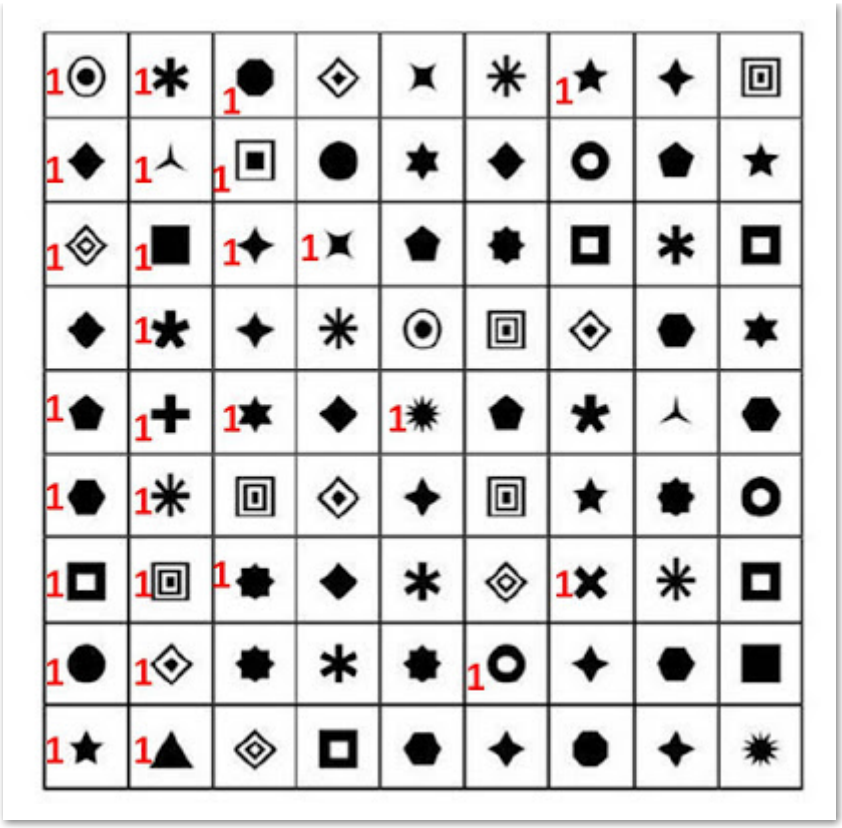
No. of faces in front direction = 2 (not considering the slant portion)
No. of faces in other three directions (right, back and left) = 2*3 = 6

Surfaces from top = 9
Surfaces from bottom = 2

Total = 2+6+9+2 = 19

2) 26

In the below image, I've marked the different symbols with the letter '1' in red.

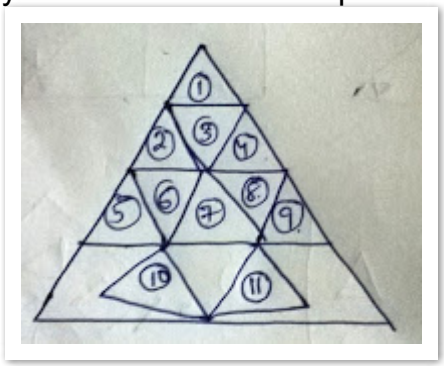


3) 8

Couldn't spend much on this coz of time and this one is really tough, have been scratching my head on how to solve. Will check this again during free time and update about the way of solving this question.

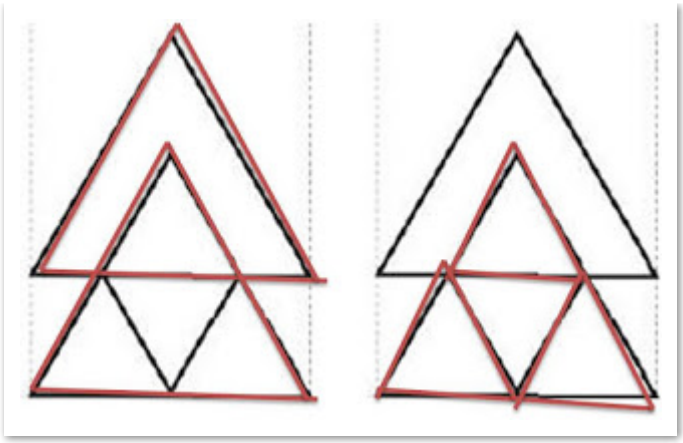
4) 11

Below figure shows one possibility. We can have similar possibilities.

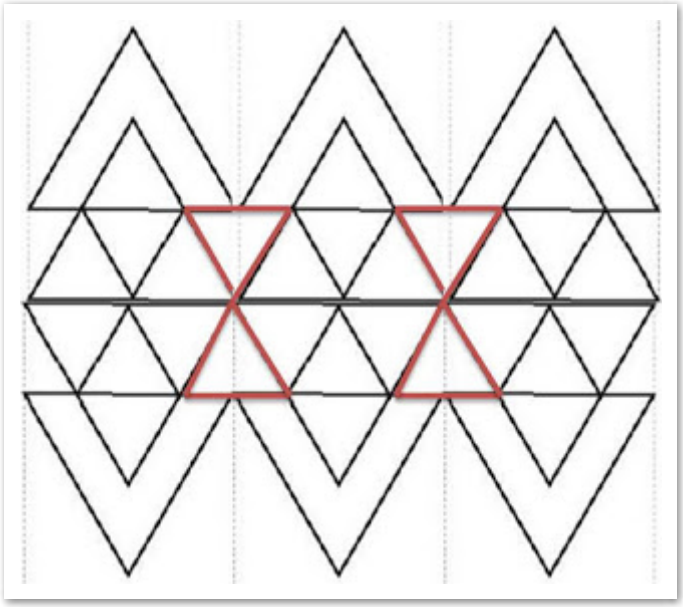


5) 50

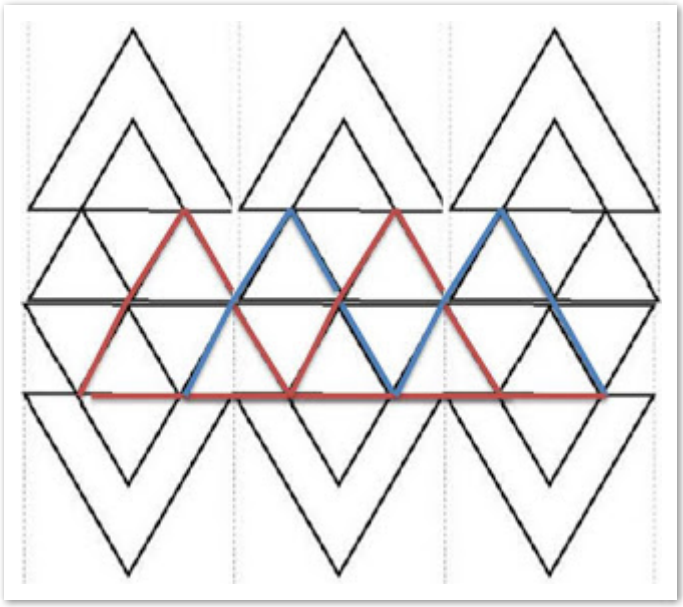
Before cloning the shapes, we will count the no. of triangles so that we can just multiply the number of triangles after cloning by the number of clones. Below image shows the same image in two separate forms. Number of triangles are 6. Now, since we are cloning to the left and then to the right, and finally the whole (3 patterns) to the bottom, we will have six such patterns.

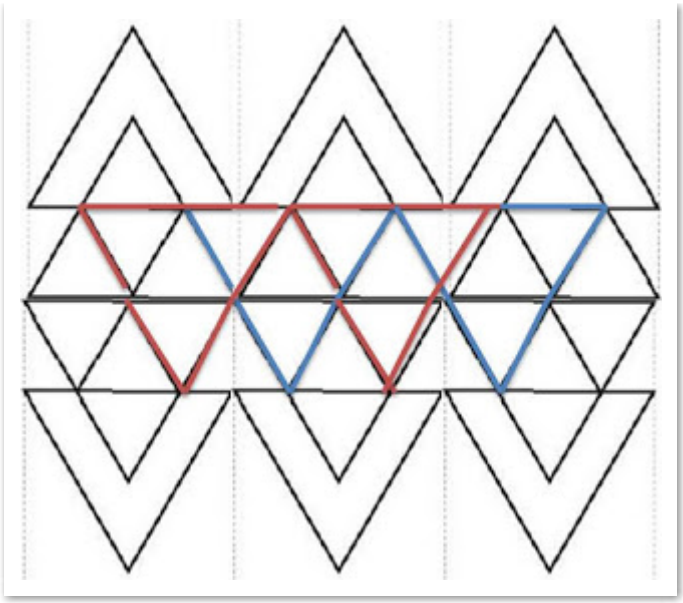


Now, after cloning, we can count the following 4 triangles as shown below.

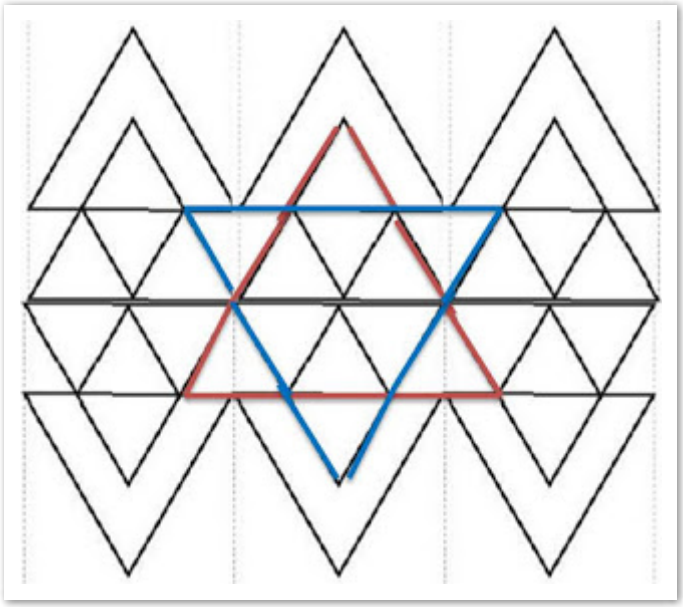


The following two images shows further number of triangles as 8.





Finally, the below image shows 2 triangles formed.



Total no. of triangles = 6*6+4+8+2 = 50

6) 26.17

Net profit of the company = 68799-2456-4789 = 61554
Now, operating Profit Ratio = 61554/Sales = 61554/235126 = 0.2617
So, 26.17 %

7) 12

The several possibility ways are
A-D-G-H-I
A-D-G-H-E-B-C-F-I
A-D-G-H-E-F-I
A-D-E-H-I
A-D-E-F-I
A-D-E-B-C-F-I
A-B-E-H-I
A-B-E-F-I

A-B-E-D-G-H-I
A-B-C-F-I
A-B-C-F-E-H-I
A-B-C-F-E-D-G-H-I

8) 85

The problem can be solved as follows.

Given:
8 men and four women shook hands with same gender. So, it mean there are 4 groups of 2 men each, whom shook their hands with each other, totaling to 4 hand shook consisting of 8 men.
Similarly since 4 women found that they shook with same gender, it mean there are 2 groups of 2 women each which counts to two hand shakes. Got it.
So, outting it like
MM + MM + MM + MM + MM = 8 men and 4 shakes
WW + WW = 4 women and 2 shakes
counting to total 4+2 =6 hand shakes,
Given, total hand shakes is 87, so the left (87-4-2 = 81) hand shakes has to be done by a group consisting of one men and one women each that is MW.
Adding these 81W from the 81 groups to the 4 women earlier we get 85 women as total.

9) 65*(25/60) minutes

It's obvious,

For every 60 ticks of the minute hand, the hour hand would have ticked 5 times.
put it like

60 ticks of minute hand = 5 ticks of hour hand

So,
1 tick of minute hand = 5/60 ticks of hour hand

5 ticks of minute hand = 5*5/60 ticks of hour hand

Now, after the 12 o' clock, they will meet somewhere after an hour, i.e. when the hour hand is near to 1 hr and the minute hand also at the same location.

That is, the minute hand had to travel an whole round (60 ticks) when the hour hand travels to 1'o clock. But still they haven't met. The minute hand has to travel further to 5 minutes, adding to a total ticks of 60+5 = 65 minutes.

But by the time the minute hand reaches the 5 min zone (number 1 on the clock), the hour hand would have moved 5*5/60 = 25/60 past number 1 (5 min) - check above for how 5*5/60 came).
So, approax, they meet at 65 + 25/60 minutes

10) 12

Similar question has been solved already in my solutions to previous papers.
If it's just circles, then around a coin/circle, we can place 6 circles, but now the situation has spheres, so apart from this 6 spheres on the same horizontal plane, 3 spheres can be placed above and 3 spheres below. So, total 12 spheres. Hope you got it. If not, I can draw and explain you!

11) 99

Given Tank dimensions = 20X5X10

Volume of water that can fill the tank = 20*5*10 = 1000 cc

Given volume of water already in it = 307 cc

So, balance volume to be filled with bricks = 1000-307 = 693
Volume of brick = 5*2*1 = 10 cc

but, given that the brick absorbs 30% of its own volume, which will be = 10*30/100 = 3 cc

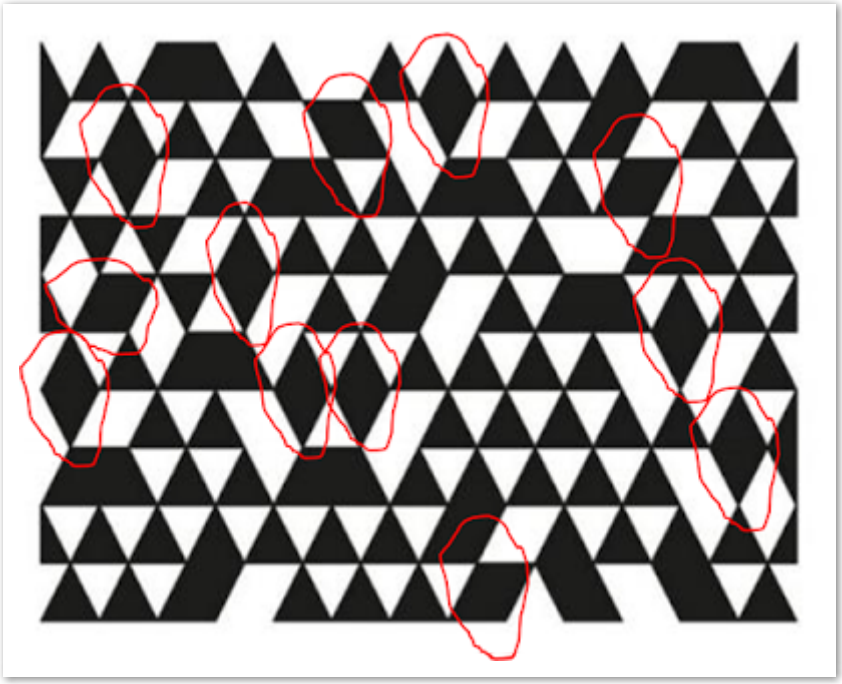
so, it mean if we place one brick in the water, it will consume 3 cc of water apart from displacing the water.

So, it's better t oassume that the volume of water displaced by each brick will be = it's own volume - volume consumed by it
= 10 - 3 = 7 cc

So, the required no. of bricks = 693/7 = 99 no's

12) 12

check the below image

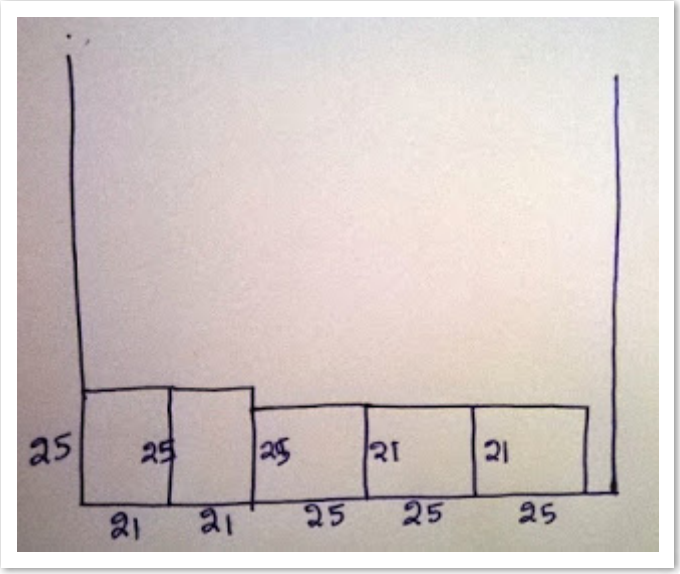


13) 1068

Given dimension is 48m X 1.2m,
converting to centimeters, we observe dimension as 4800 X 120 cm

Now, the below picture shows one best possible arrangement. As can be seen, arrange two sheets in a row, such that 25 side is vertical and 21cm side is horizontal (shown as two sheets) in the left bottom. And also arrange three other sheets such that 25cm side is horizontal and

21cm side is vertical. Three of such sheets can be placed.



Now consider the bottom left most sheet, similar sheets when placed vertical will occupy 4800/25 = 192 sheets.
Since there are two such sheets, we have 192*2 = 384

Now, consider the sheet placed such that 21cm side is vertical, placing such sheets one above other, we can get 4800/21 = 228
Three such columns are there, so, 228*3 = 684

So, total no. = 684+384 = 1068

14) 22

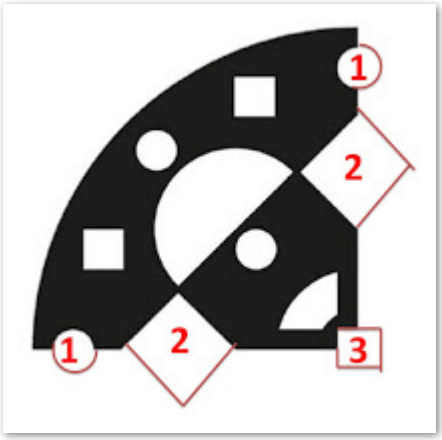
Most of you might get 21 as answer, but let me show the hidden tree branch which you might count as 2 instead of 3. This is the right most part of the given image.

15) 33

Instead of drawing the whole image, let me show the part given by them with illustration of what happens when we join sides. As can be seen, the semi circle at 1 will form a circle, similarly the

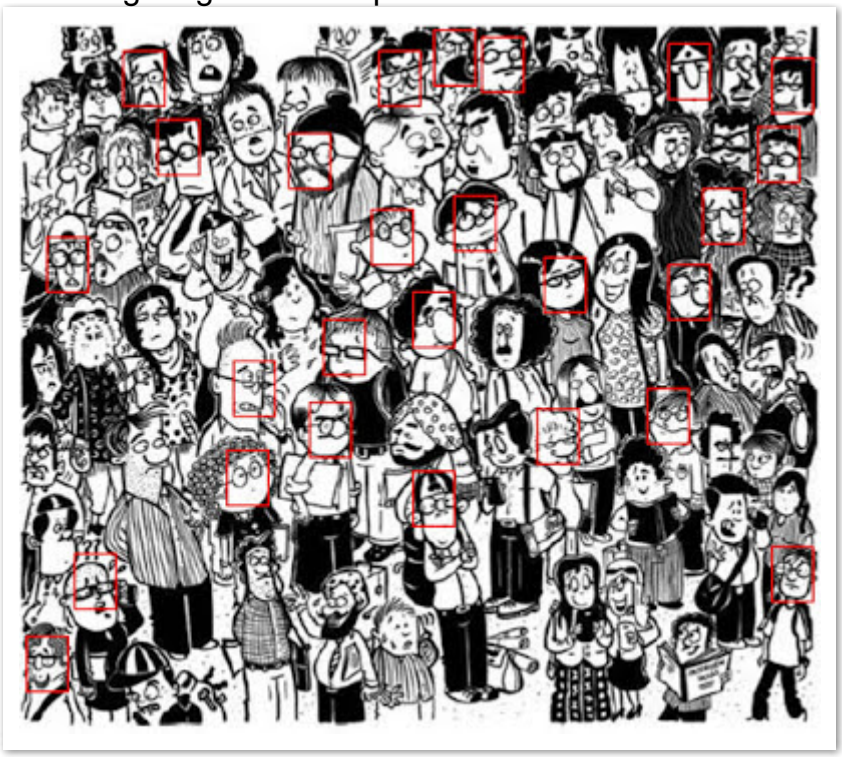
triangle at 2 forms a rhombus. Similarly the cut at 3 forma a square. Neglecting the shapes at 1,2,3, let us count the number of shapes as 6. Since there are four such patterns. So, total number neglecting 1,2,3 is 6*4 = 24.
Now, total no. of 1's = 2*2
total no. of 2's = 2*2
total no. of 3's = 1

SO, total no. of holes = 24+4+4+1 = 33



16) 26

Below I've identified the faces with glasses for your benefit. But, remember, during exam, you have the face questions on the computer and not on paper, so, you need to do this mentally. So, use your concentration for figuring out the required.



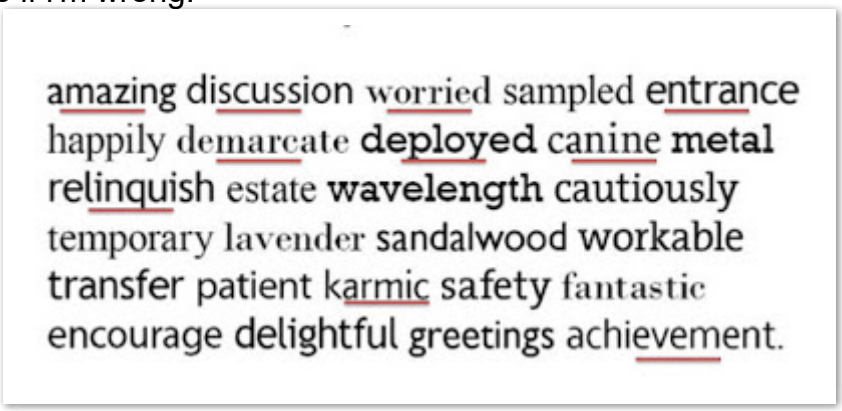
17) 810000

The best possible combination is in order below
1) press 9
2) press 00
3) press X
4) press 9
5) press 00
6) Press =

So, the largest number = 900*900 = 810000

18) 10

I'm not pretty confident about this. But I tried my best to figure out. Below image shows my findings. Correct me if i'm wrong.



19) 451

20) 0.82

Probability that only one of them finds a parking space = prob. that either one of them finds a park
= (prob that car finds a space AND prob. that bike doesn't finds a space) OR (prob that car doesn't finds a space AND prob. that bike finds a space)

In probability, AND is denoted by '*' and OR is denoted by '+'

So, probability = 0.1*0.1 + (1-0.1)*(1-0.1) = 0.01 + 0.81 = 0.82

Scetion B: MSQ

21) B,C

(I don't think explanation is required for paragraph related questions)
For more on paragraph related questions, check Resource page of UCEED

22) A,D

23) A,D

24) B,D

25) A,B,D

26) A,B,C,D

27) C

Check this on how to deal with unfolding of solids - 3D Manipulation

28) A,B,D
By observation

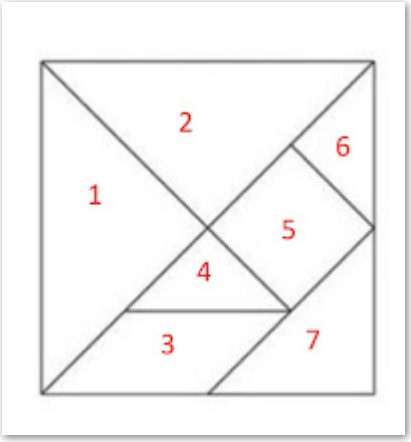
29) B,C

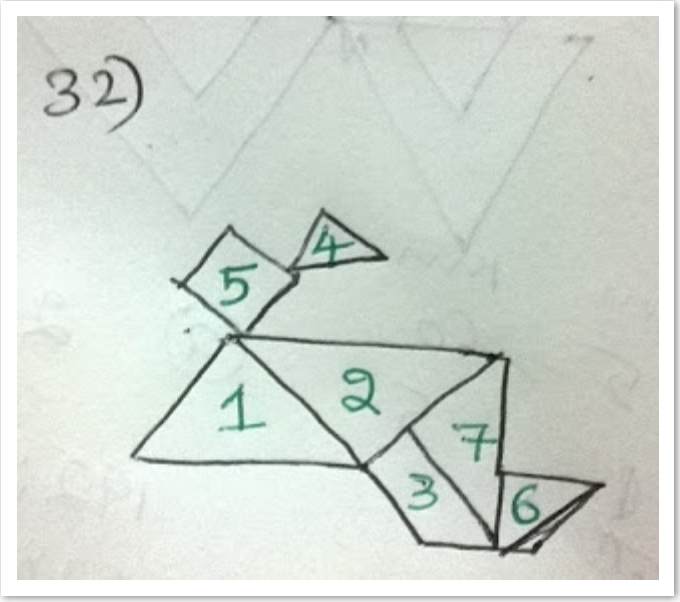
30) A,C

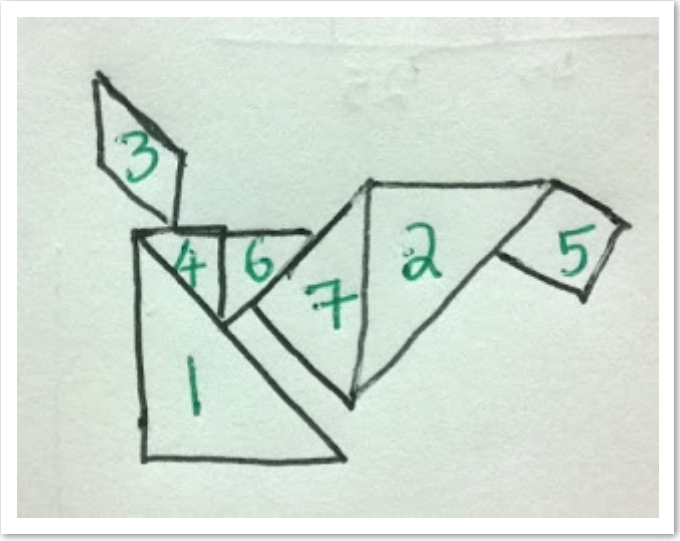
31) A,B,C

32) B,C

Check the below images for explanation. I followed the following numbering for explanation







33) A,D

Check this on how to deal with unfolding of solids - 3D Manipulation

34) D

Unless there are sliding joint in the first three mechanisms, it cannot be folded. Mechanism in figure 4 is the standard four bar mechanism, and it can easily be folded.

35) A,C,D
By observation

36) A,B,C,D

In figure one, curve is bulging at the top, it means more aged people are there compared to infants and teens. Second graph has steady rate for all age groups. In graph 3, infants are more in no. than aged people. Remember that in developed nations, population of infants has been controlled, compared to adult and age groups or at least equal.

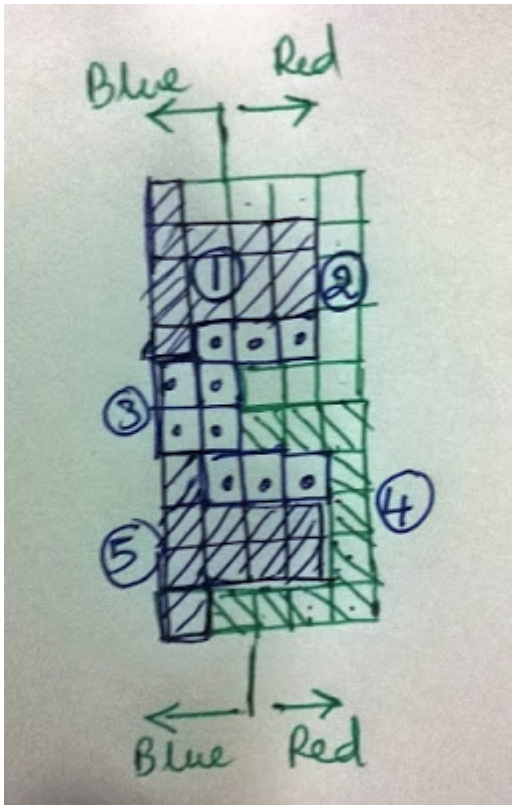
So, all four options apply.

37) C

The answer is simple. Find the number of alphabets and repetitions in it. There are total 7 alphabets with two repeated (A is appearing twice). In the options check the pattern that has this feature - that is two repetitions and total 7 items. Option C has that feature by using colors.

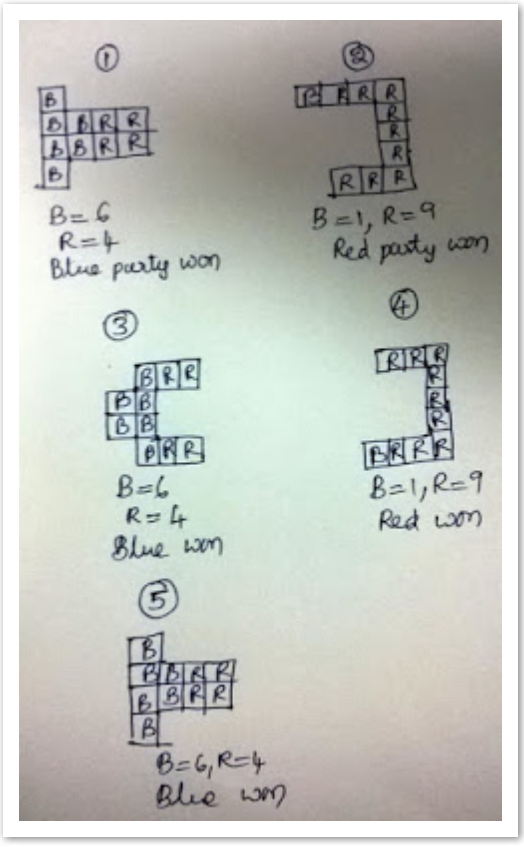
38) D
The questions seems to be tricky with no clue. But, the first and best check that one can do is check the number boxes in the five segments in each option, since they have mentioned that they should be continuous and have equal no. of families. Fortunately, only option D satisfies!

Update:
Checking that with the above simple way, we get two options that satisfy it. I therefore discuss with you the actual procedure for solving this problem. Considering the five patterns in option D, we try to arrange it such that the whole combination forms the rectangular grid shape as given in the actual picture, which when joined will be as shown below.



As you can see, I've marked the separate parts with numbers from 1 to 5. I've also marked the parts which according to the ques are blue (to the left of section line) and red (to the right of the section line).

Now the next image shows my explanation, showing the parts sepearately and the count of Blue and red parties according to the above image division.



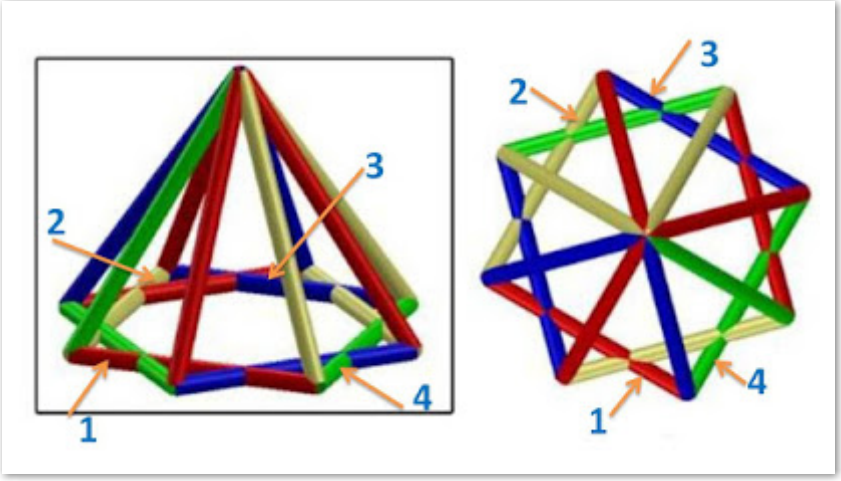
As you can see, for the first part (of 10 families/boxes) 6 families/boxes are blue while the rest 4 are red, so blue won, likewise

II pattern - red won
III - Blue won
IV - Red won
V - Blue won

So, overall, blue won the election in three divisions while red only in two, so that will be the answer, Now, I hope you can check for others too.

39) A,B,C

Option A is the top view of the given image in the box. You don't have to check the whole lines initially, start with the bottom two squares formed by four different colors, observe the order in which they are arranged. Like in the below image (left pattern in the box), one of the square base has been numbered as 1,2,3,4 for red, yellow, blue and green colors respectively. Observe similar arrangement for the other base square. Now, in the options, observe these 1,2,3,4 sequence for coincidence (for both the base squares). Once you screened the appropriate options, you can now check the triangles joining the base to the top vertex for the pattern.



Note that option C is the bottom view of the given pattern n the box. So, all the color order are just reversed.

40) Water flows out through A,B,D holes

It's bit difficult to explain this in paper. But the only clue I can give is, cheek for the tunnels which are either in the same row from top or a row adjacent to the water flowing row. Because, water will find way to flow in both cases. Other than the tunnel numbered 8 in front face (tunnel numbered 8 in the front face middle, 4th row from top), water will flow in all other holes.

Section C: Multiple Choice Questions

41) B

The answer is simple. Consider the donut shaped circle with plus/cross (+) sign as highlihted in the beliw first picture. Now, the circle has moved to the top of the center circle as shown in the second image. Let's consider it is turning clockwise and the rotation is thus 180 degrees. Now i nthe third image, the same circle is rotate di nthe same direction (clockwise) but with angle 180+90 = 270. In the fourth image, rotate the ciecle in the same direction (clockwise) but with angle 180+90+90 = 360 degree. So, obviously in the firth sequence, the ciecle has to be rotated clockwise in 180+90+90+90 = 450 degree. Got it ? all the four circled symbols inside the pattern

follow the same proceedure. Now, check the option that represnets 450 degree rotated view (of inner 4 circles) rotated from the fourth sequences. Option B and D matches. Now, observe the center circle. In the first image it's a circle with dot inside, in the second image it's a donut (empty shape inside a black circle). follow the pattern
first - circle with inner dot
second - donut
third - circle with inner dot
fourth - donut

So, obviously, the next pattern should have 'circle with inner dot'. Thus option B suits

For more on how to solve this question, check the mental ability part of the resource page.

42) D

All the options have same color, so let's forget about the color criteria given in the conditions.

As given in the grid form with numbers, and following the arrow-ed directions, we get

(Grid No.) - (no. of sides of polygon)
start - 5 sides (since it's pentagon shown in red color)
4 -> 5 + 1(rule i) +1 (rule iii) = 7
9 -> 7 - 2(rule ii) - 1 (rule iv) = 4
8 -> 4 + 1(rule i) +1 (rule iii) = 6
5 -> 6 - 2(rule ii) = 4
2 -> 4 + 1(rule i) +1 (rule iii) = 6
7 -> 6 - 2(rule ii) = 4
6 -> 4 + 1(rule i) +1 (rule iii) - 1 (rule iv) = 5
1 -> 5 - 2(rule ii) = 3
2 -> 3 + 1(rule i) +1 (rule iii) = 5

So, the final shape is again five sided, i.e. pentagon

43) C

By careful observation, this can be solved. If you're not confident, then better draw the pattern by linking similar sides.

44) C

It's obvious that the other shoe sole should be the mirror image of the given shoe. All the options might look similar but there's difference in the wave like lines at the c=middle of all the soles. Only option C is proper.

45) D

The colors are analysed as follows

For the top part of the circles
Yellow + Blue (yields) -> Dark Green
Dark green (yields) -> light green

For the left part of the circles
Blue + Red -> bright violet
bright violet + yellow -> dark brown

For the right part of the circles

Red + yellow -> dark orange
orange + yellow -> light orange

For more about color combination - check Resource page of UCEED

46) A
Obviously it should rotate in the opposite direction as the rotation when the water is sprinkled through the nozzles, which will be in clockwise direction for the given shape of the sprinkler.

47) C
It will not be sphere, since the question needs the portion that is common to all the four spheres. So, the sphere part is cut a bit to a shape something similar to C.

48) A

The first impression that I got after reading the question gave me a shock! was wondering whether something like hammer is used for any instrument that too musical ? then later realized that it's the kind of mechanism that they wanted. Hammering here they mean the technique of hitting the string rather than sliding (as in violin) or picking (like in guitar).

49)

I'm not sure about this question

50) A

I don't know whether there is any such mathematics existing to use parameters to construct a shape or not (I think there isn't any standard in math literature), but I do see some pattern from the given images. The values of R and r will give us an idea of how many sides the shape is having. Like R/r is the no. of sides of the shape.
For the first image, R/r = 5, so, it has five sides, (all formed by 5 circles intersecting one another)
For the second image, R/r = 5, so therea re 5 sides
For the third image, R/r = 16/4 = 4, so there are 4 sides
For the second image, R/r = 108/4 = 27, so there are 27 sides, all formed with circles.
Now, 'c' might represent the amount of bulge of the circle used to construct the shape, in other words the curvature or radius of the circle used for constructing.
As can be observed, when c i more, the intersection is more, as compared to when c is less.

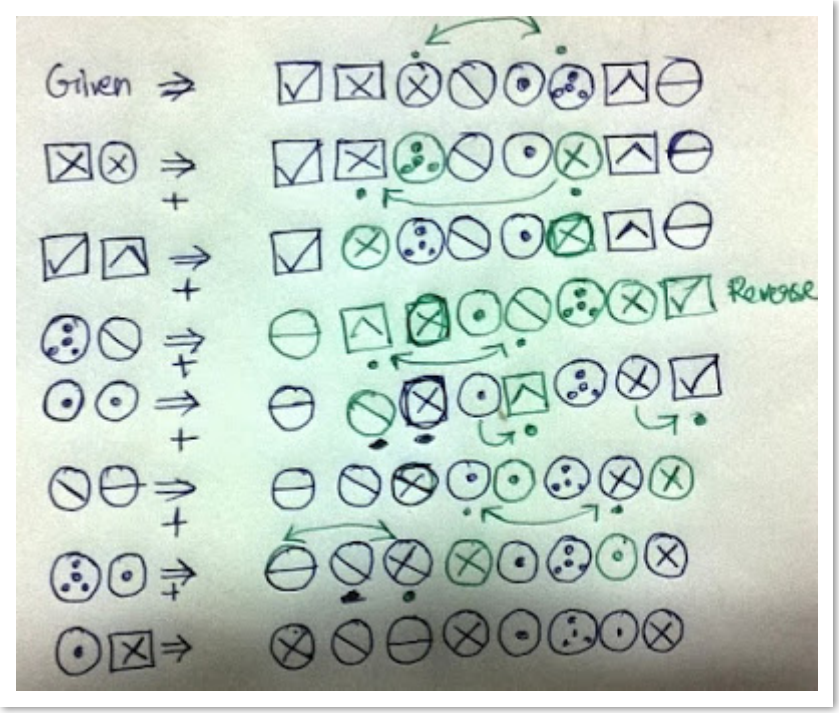
So, in the required shape, which ahd three sides, the best combination is R/r = 3 (24/8 in option) and since the shapes are bulges out, the value of c might be the least. So, option A fits.

51) C
I don't think explanation is required for this

You can check more paragraph related question here - check Resource page of UCEED

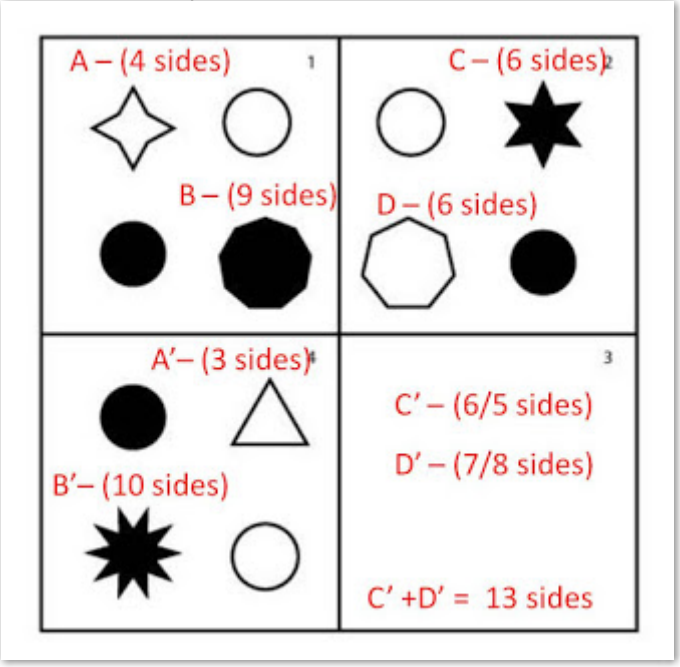
52) D

Obtained by following the procedure that they gave.
Below image shows the step by step change made for the given sequence. Green symbols (and arrows) indicate the change that has been made for the given pair of symbol.



53) D

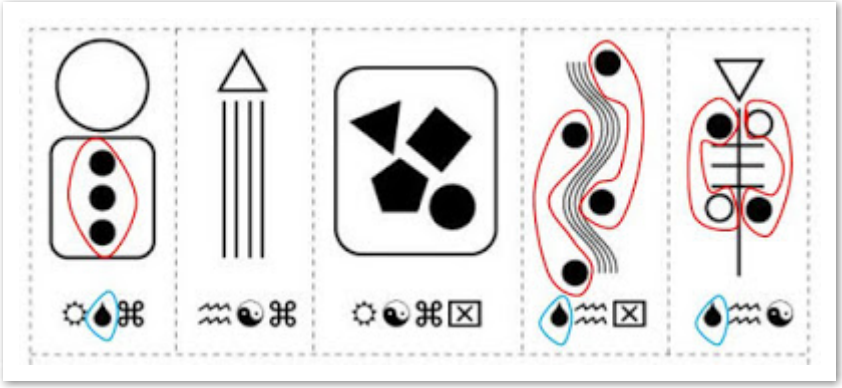
Solution is simple, but bit of observation is needed.
As can be seen in the below picture, it's obvious that we don;t have to bother about circles as all the squares have two circles each. Now, observe the first and third numbered square in the below image. As can be seen. Shape A of 4 sides/peaks has been transformed to A' of three sides/peaks (with difference 1). Similarly shape B of 9 sides/peaks has been transformed to shape B' of 10 sides (with difference 1). And note that A+B = 13, as well as A'+B' = 13.



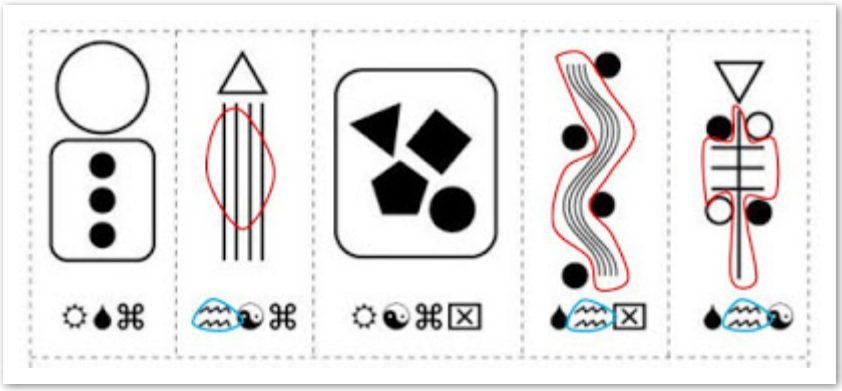
Keeping this pattern in mind, shapes in square numbered 2, viz. C and D (C+D = 13 sides) should be transformed to shapes C' and D', such that C'+D' = 13, and difference should only be 1 between them, the possible combinations as are as shown in image, i.e C' can be either 6 or 5, and D' can be either 7 or 8. Now, check the options which best matches this pattern. Option D suits I guess.

54) B

It's really tough (at least for me) to exactly figure out the pattern. However, as always, we can derive some pattern out of given sequence. So, here is what I observed. As can be seen in the below image, wherever circles are appearing in the main image (highlighted in red color), then we can see a dark water drop symbol accompanying it (highlighted in blue color).



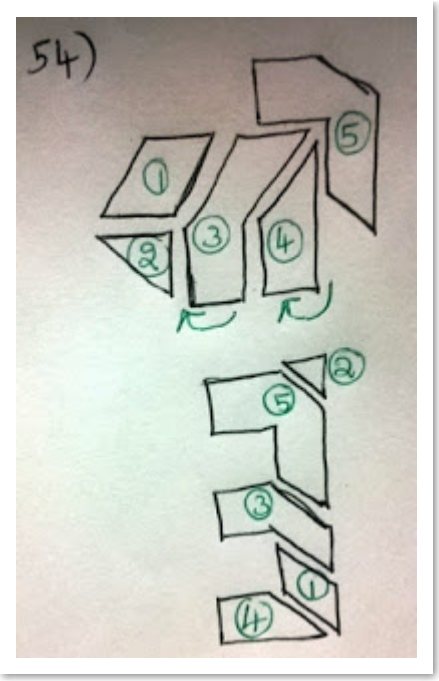
Similarly when there is unbound lines (lines that are not closed to form a shape) as highlighted in the below image, we see the shape of two zigzag short lines accompanying that as highlighted in blue color.



Now, in Fig.1. since we can see both circles as well as lines (not rectangles), we can assume that the two symbols (water drop and zigzag) must also exist. So, option B seems to be correct. Although this might not be a correct interpretation, but this is how I solve.

55) C

Below image shows the construction. I've numbered the parts for your convenience. Note that the parts numbered 3 and 4 has to be rotated 90 degree clockwise for the final assembly and the final assembly is a flipped E. We can just flip it to get the actual shape as in Fig.1.



56) D

57) C

Dip your toe in the water -> tentative step
Come hell or high water -> Persistent in the face of difficulty
Mout hwatering -> tasty
head above water -> survive

58) B

In downward to-and-fro position, we tend to bend bit and try to push and pull the hack saw. So, keeping the handle either horizontally or vertically will only cause strain to hands and will not function well as there will be bending possibly between every to-and-fro motion . Posture in option D will separate the blade frame from the material in downward f=direction (because of handle direction being 45 degree outer), which is one inefficient way. Keeping handle as in option B works fine, and will always ensure that the tool (hack saw blade) is in contact with the material all the time.

59)

I'm not pretty sure. Probably if I come across a pilot, I will ask him ;)

60) A

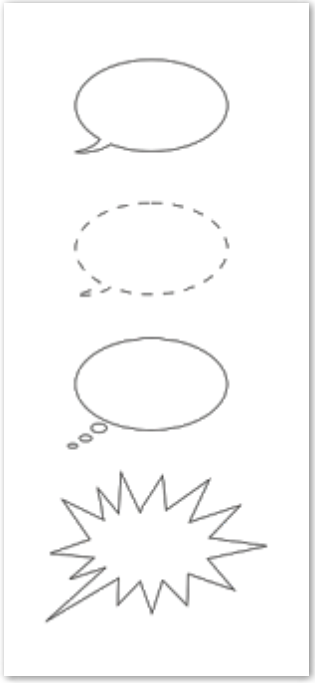
Tough to explain this in paper, but what you can do is speak yourself "welcome to uceed" very slowly and observe how your mouth is moving.

Refer these pages for more information on mouth shapes
Tutorial 1
Tutorial 2

61) B

Okay, here goes the convention :

1. Whenever tail is included with the bubble, then it means converssation is happening either directly or through whisphering
2. When the bubble is dashed with a tail, then it indocates whispering
3. When the bubble is made of continuous line with a tail, then it is a direct conversation (speech)
4. When the bubble is made of zigzag lines, it mean shouting/screeming etc
5. When the bubble is followed by a circled dots at bottom as shown in the below picture, it indicates thinking process.
6. When instead you see box, then it is just explanation of the situation (past or present or future) which is neither been spoken by anyone nor indicates thinking process but is just a narration of the situation.
7. Below image should give you an idea.



For more details refer to - Link 1
wikipedia guide

62) A

Refer this page for more on - color and video basics

63) C

64) A
For more on animation, refer this - Animation study

65) D

I was able to spot 6 differences

Below image shows the difference. Note that difference numbered 2 and 3 indicates the color change.

66) No answer!

I think, the options that they showed are wrong! They showed like the front two legs will go crossed while running which I suspect whill not happen, and the back hind legs will not be on the same line as far as I observed.

67) D

You can play with these online tool and learn about different combinations -

68) C

69) A

70) C

71) B

two reflections one each on the mirror surface and one reflection at the intersection of the two mirrors. If the ball was placed in between two parallel mirrors, then there would be infinity reflections!

72) D

COG lies at the mid way of the mass and not at the mid if the object. So, the top surface of the T shape contributes more weight and hence the COG should be somewhere around the border of the two surface intersections, but placed little distance away from the horizontal top T surface as shown in option D.

73) C

Option C is the correct rotated view

74) B

By observation

75) D

The Kyoto Protocol is an international treaty which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC) that commits State Parties to reduce greenhouse

gases emissions, based on the premise that (a) global warming exists and (b) man-made CO2 emissions have caused it.

The Ramsar Convention 1971 is an international treaty for the conservation and sustainable use of wetlands.

The Vienna Convention 1981 on the Law of Treaties (VCLT) is a treaty concerning the international law on treaties between states.

Montreal Protocol 1989 on Substances that Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of numerous substances that are responsible for ozone depletion

76) no answer!

i indicates ecofriendly disposable
ii indicates Hazard/warning/dangerous etc
iii indicates recyclable products
iv indicates caution

For more list of symbols check the following pages - wikipedia page

The best option could be B, if X-iii was used instead X-iV

77) D

78) A

I think so,

79) A,B

Pellagra is a vitamin deficiency disease most frequently caused by a chronic lack of niacin (vitamin B3 or synonym: vitamin PP (from: Pellagra Preventing factor)) in the diet. It can be caused by decreased intake of niacin or tryptophan, and possibly by excessive intake of leucine.
Anorexia - Eating disorders
(source: internet)

80) B

It's clearly identifiable by observation.