

Critical and Creative Thinking (CCT) Practice-VI

2020

UNIT 1: PEN DRIVE

Why it is a Pen Drive

-V. P. Mahur

Pen drive is your name
But you don't look like
A pen in any way
There is not a single thing
Yet they say
You are pen drive

Pen drive is your name
But you don't look like
A driver from any angle
You can neither drive
A car nor a train
Let alone the plane
Tell me honestly
The logic

Behind your name
For owing to this name
You have got
A great fame

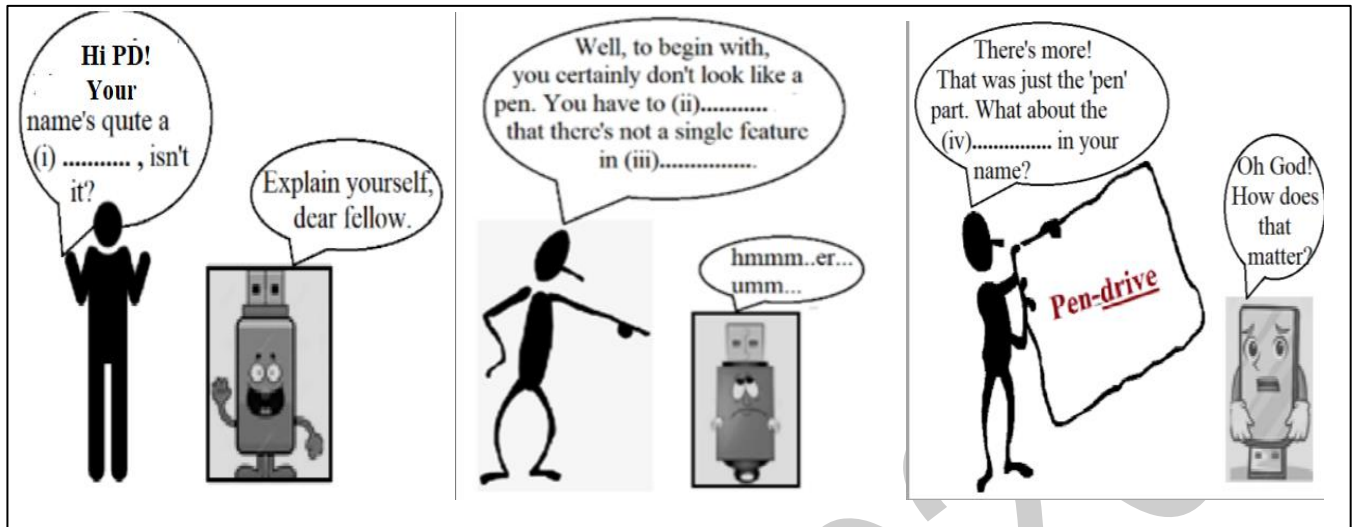
Oh! Wait a little
I think I can explain
The secret of your name
You write many records
Like a pen
And carry them at places
Like a driver
Yes, your name's explanation
Is my latest invention
Did you like it?

(Source: <https://www.poemhunter.com/poem/why-it-is-pen-drive/>)

Instructions for Questions 1 to 4:

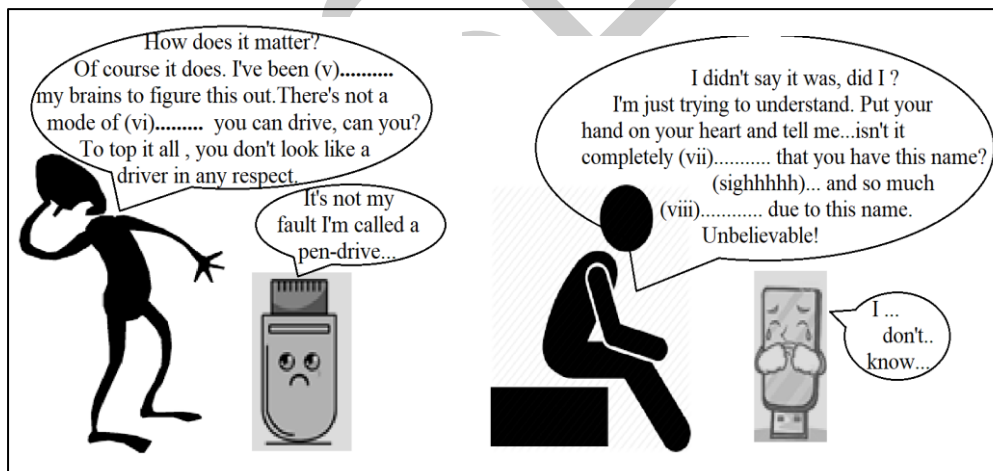
Complete the dialogues in questions 1 to 4 by choosing the correct options from those given.

Question 1. Complete the dialogues based on the poem by choosing the options that lists the correct answers for each blank.



- a) (i) joke, (ii) analyse, (iii) favour, (iv) 'task'
- b) (i) mismatch, (ii) guess, (iii) favour, (iv) 'case'
- c) (i) mismatch, (ii) admit, (iii) common, (iv) 'drive'
- d) (i) joke, (ii) guess, (iii) common, (iv) 'metal'

Question 2. Continue to complete the dialogues based on the poem by choosing the options that lists the correct answers for each blank.



- a) (v) matching (vi) work (vii) illegal (viii) performance
- b) (v) racking (vi) data (vii) illogical (viii) commotion
- c) (v) matching (vi) thought (vii) illegal (viii) confusion
- d) (v) racking (vi) transport (vii) illogical (viii) popularity

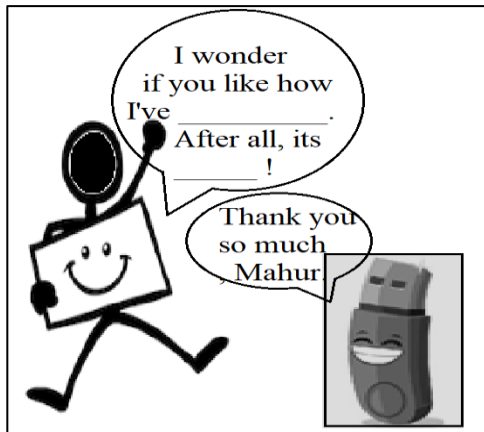
Question 3:



3.

- a) just like a pen, you too think of ideas; you distribute these ideas around to various equipment first, like a delivery person.
- b) just like a pen, you too have a cap; you work only when the cap is removed first, like a driver.
- c) just like a pen, you too are metallic; you carry the heavy load to and fro, like a driver.
- d) just like a pen, you too write records; you carry these records around to various places first like a driver.

Question 4:



4.

- a) changed your name; my latest submission
- b) explained your name; my latest creation
- c) criticized your name; my latest sale
- d) revealed your name; my latest suggestion

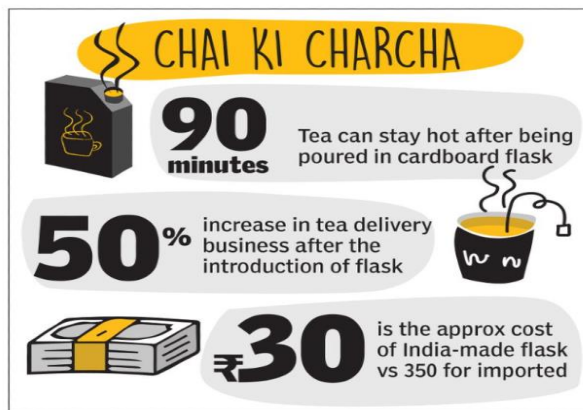
Question 5:

The poet communicated a few things to the pen drive. Match the pen-drive's probable feelings (Column B) in response to the points the poet puts across (Column A). There are some options you do not need. [You may look at images of Q1 to Q4 again for clues]

Poet's monologue	Pen-drive's probable feelings
1) You hardly look like a pen.	(i) irritated and sulking
2) The popularity you have isn't fair, is it?	(ii) frightened and angry
3) I can explain the secret of your name.	(iii) excited and curious
4) Did you like my new creation explaining your name?	(iv) overjoyed but scared
	(v) troubled and sad
	(vi) grateful and happy
	(vii) confused and tongue-tied.

- a) 1-vii, 2-v, 3-iii, 4-vi
- b) 1-iii, 2-i, 3-iv, 4-v
- c) 1-ii, 2-i, 3-i, 4-vii
- d) 1-i, 2-v, 3-iv, 4-iii

UNIT 2: THE RISE OF TEA FLASKS



The online chai-ordering business has turned piping hot, thanks to a simple but game changing heat-retaining cardboard flask that has enabled restaurants to deliver the brew fresh to consumers across cities. Business has boomed. Chai Point, a café chain focusing on tea-based beverages, has witnessed its tea-delivery business double every year. Similarly, one-fourth of Chaayos's business currently comes from

tea-delivery, which is growing at over 50% every year. Both Chai Point and Chaayos started delivering tea in 2014. "We started as a brick-and-mortar retail chain but that humble cardboard flask simply digitized our business," Amuleek Singh, co-founder and CEO at Chai Point told TOI.

For most office goers in India, sipping quality hot tea has generally meant stepping out of office to the nearest chai shop or walking to a tea vending machine. Options were limited. Both Chai Point and Chaayos now offer a larger menu for the discerning tea-drinker: shahi chai, pahadi chai, aam-papad chai, ginger chai, jaggery tea, sulemani chai and much more.

Singh, who claims that Chai Point is the first company in India to bring in the concept of the disposable flask, got the idea of getting one designed when he saw consumers walking in to his outlets with flasks to carry freshly brewed tea back with them.

"In the beginning, we tried to keep traditional flasks at our outlets to deliver tea to consumers and offices. But collecting and cleaning them became too cumbersome. So, we reached out to global manufacturers of the cardboard flask," said Singh, who had seen Dunkin Donuts deliver coffee in a similar fashion, during his Harvard Business School days. The \$5 (approx. Rs 350) import cost of one flask, however, was a deterrent and Chai Point decided to get one designed here. It took the company two years, including trial runs, to launch the final product. The Make-in-India flask costs about Rs 30, bringing down the production cost to a fraction of the imported one.

"The flask in which we deliver tea is basically a cardboard box with several layers of polymers. It relies on the trapped air between the layers for insulation," said Nitin Saluja, founder and CEO of Chaayos, which operates around 75 cafes across several cities.

Tests conducted by the Chaayos R&D team revealed that chai poured into the flask at 90 degrees centigrade remained piping hot for around 90 minutes. "The temperature falls to around 70-75 degrees within that time. In comparison, the hot water that flows out of our geysers at home normally does so at 50 degrees," said Saljua, the 36-year-old graduate from IIT Bombay.

Orders for tea peak between 3 pm and 7 pm and 9.30 am and 12 pm with white collar workers between the age of 24 and mid 30s a key target group. The demand, however, has also started spilling over to weekends, which shows that consumers are ordering tea from their homes, as well.

Question 6:

‘Piping hot’ usually refers to food or drinks that are extremely hot when served. This phrase in the sentence, ‘The online chai ordering business has turned piping hot’ means that it has

- a) transformed its products and personnel suddenly
- b) changed its branding and advertising.
- c) become popular and successful.
- d) developed new products and lesser known products.

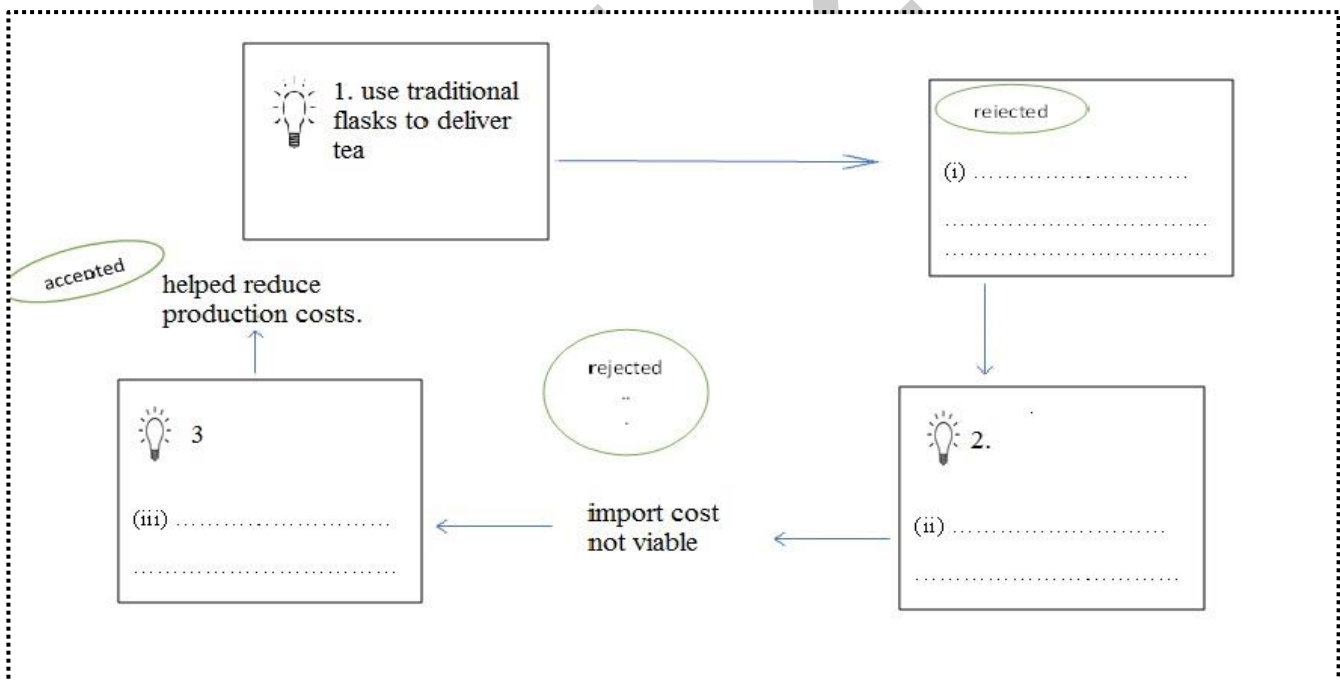
Question 7:

According to the article, the cardboard flasks help in digitising business by

- a) adding to the environment-friendly waste.
- b) making delivery of online orders for the hot beverage possible.
- c) recording the fastest hundred orders online.
- d) defining a procedure of customer service.

Question 8:

Complete the following about the journey of the cardboard flask creation according to Amuleek Singh.



- a) Refilling on customer request was a burden; Used cardboard flasks made by Dunkin Donuts; /Upgraded an indigenous product.
- b) Delivering was a burden; Imported from global manufacturers of the cardboard flask; Upgraded an indigenous product.
- c) Waiting to collect used flasks was a burden; Purchased cardboard flasks from foreign outlets; Utilized a mix of conventional flasks along with cardboard ones.
- d) Cleaning was a burden; Reached out to the global manufacturers of the cardboard flask to create for them; Developed an indigenous product.

Question 9:

Pick the option/s that uses 'spill over' in the same way as 'spilling over' has been used in the text.

- (i) There's no point allowing emotions to spill over and impact our judgements.
 - (ii) I try not to let my homework assignments spill over into my leisure time.
 - (iii) The jar of juice is so full, it might just spill over.
 - (iv) The class arguments can spill over into the world outside school if they aren't resolved.
 - (v) The devotee had to rush for prayers with a tumbler full of milk and had to take care that it doesn't spill over.
- a) i, ii and iii
 - b) i, ii and iv
 - c) ii, iii and iv
 - d) iii, iv and v

Question 10:

The article refers to a café chain and a retail chain. 'Chain' here refers to

- a) a sequence of linked metal rings
- b) a pack of beverage samples
- c) a series of the same type of outlets
- d) a collection of ancient recipes

UNIT 3: ANT ON THE WALK

The diagram shows the path that each ant makes by repeating these two steps

- Move one unit forward
- Turn anticlockwise through A where $A < 180^\circ$

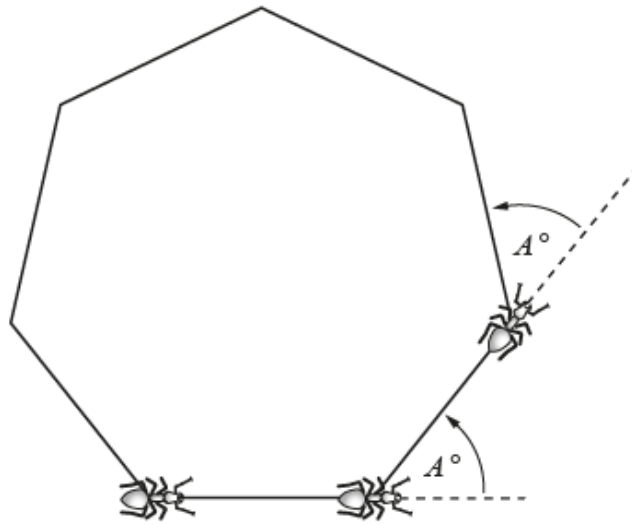
Remember: In a polygon

a) Sum of all the exterior angles is 360°

b) Exterior angle = $\frac{360^\circ}{\text{Number of sides}}$

Question 11:

The ant repeats the two steps 7 times, going around the polygon until it reaches its starting position.



The ant makes 1 complete revolution (360°) to draw this regular 7-sided polygon.

The value of A , correct to 1 decimal place is

- a) 51.6°
- b) 51.2°
- c) 51.4°
- d) 51.8°

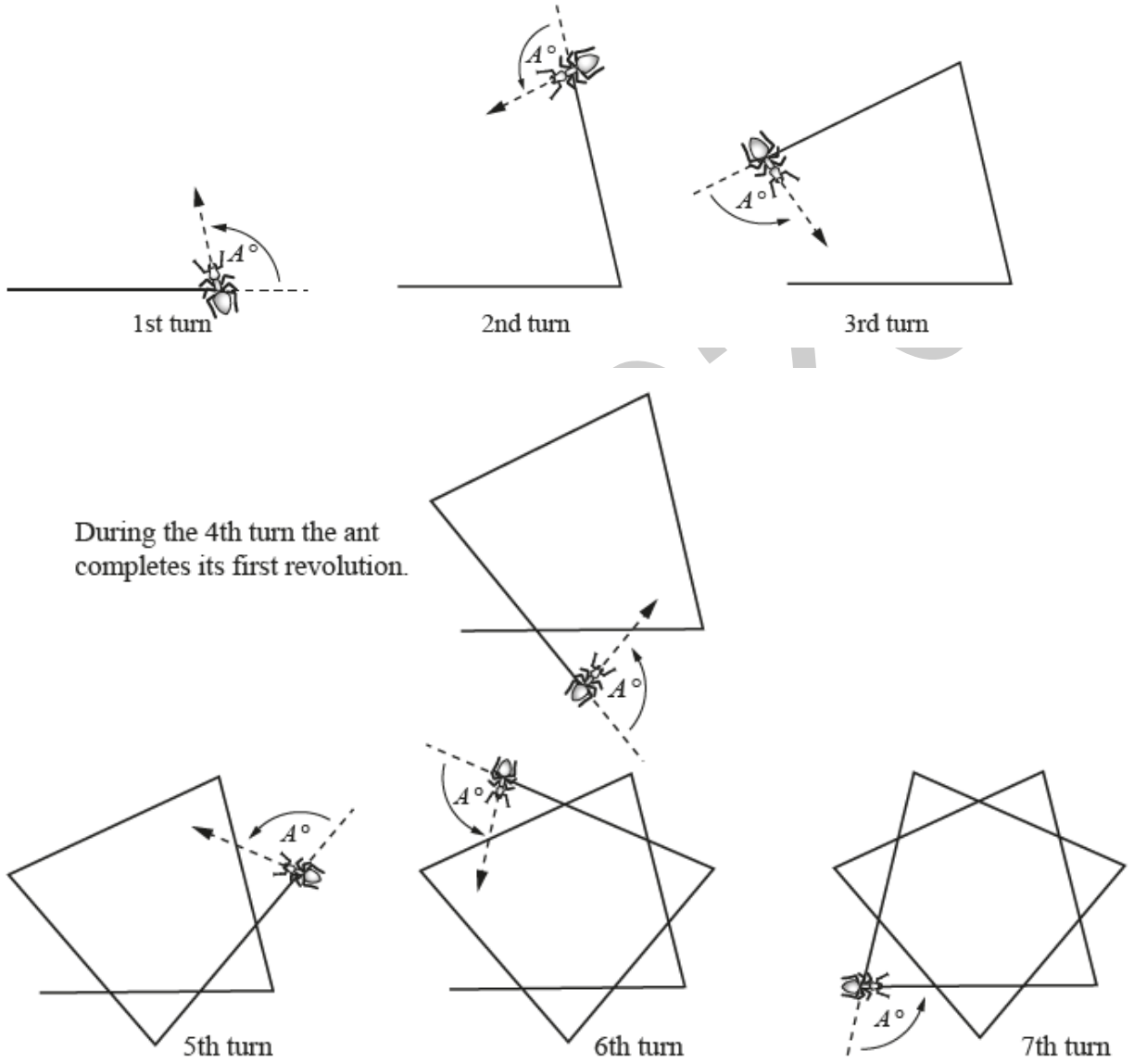
Question 12:

The ant draws a regular n -sided polygon. Choose the correct relation between A and n .

- a) $n \times A = 360^{\circ}$
- b) $n \div A = 360^{\circ}$
- c) $360^{\circ} \times A = n$
- d) $360^{\circ} \times n = A$

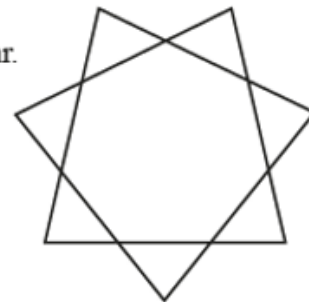
Question 13:

The diagram shows how the ant draws a 7-pointed star.



During the 4th turn the ant completes its first revolution.

Here is the completed 7-pointed star.



To draw a 7-pointed star, the ant must repeat the two steps 7 times, as shown in the diagrams. In doing so, the ant makes 2 complete revolutions. Then, A (correct to one decimal point) will be

- a) 100.2°
- b) 108.2°
- c) 100.8°
- d) 102.9°

UNIT 4: ORGANISING PARTY

Tariq is inviting Ajay, Raghav, Anisha and Aman for a small get together at his home. His mother tells him to buy some juices from nearby departmental store.



Question 14:

Tariq wants to buy some orange juice. He visits a nearby departmental store which has following offers:

Offer A One Litre Carton – Rs. 65	Offer B Two Litres Carton – Rs. 125	Offer C A Pack of 4 one Litre Cartons – Rs.256
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Tariq purchased 5 litres of orange juice. The combination of offers on cartons which would get him the lowest amount is

- a) 5 cartons of one – litre from offer A
- b) 2 cartons of two- litres from offer B and 1 carton of one- litre from offer A
- c) A pack of 4 cartons of one litre from offer C and 1 carton of one- litre from offer A
- d) 3 cartons of one – litre from offer A and 1 carton of two – litres from offer B

Question 15:

Tariq loves lemonade, so he picks up two different bottles P and Q of lemonade.

Bottle P contains 1.5 litres of lemonade.

Bottle Q contains one third more lemonade than bottle P.

The quantity of lemonade in bottle Q is

- a) 4.5 litres
- b) 4 litres
- c) 3 litres
- d) 2 litres

Question 16:

Tariq makes a fruit punch. He mixes 500 ml of orange juice, 200 ml of pineapple juice and 1 litre of lemonade. Then, the ratio of orange juice: pineapple juice: lemonade in its simplest form is

- a) 5 : 2 : 1
- b) 500:200:1000
- c) 500:200:1
- d) 5:2:10

**Question 17:**

He likes the fruit punch and decides to serve it to everyone in the party. If he uses 2 liters of orange juice then, the total quantity of fruit punch will be

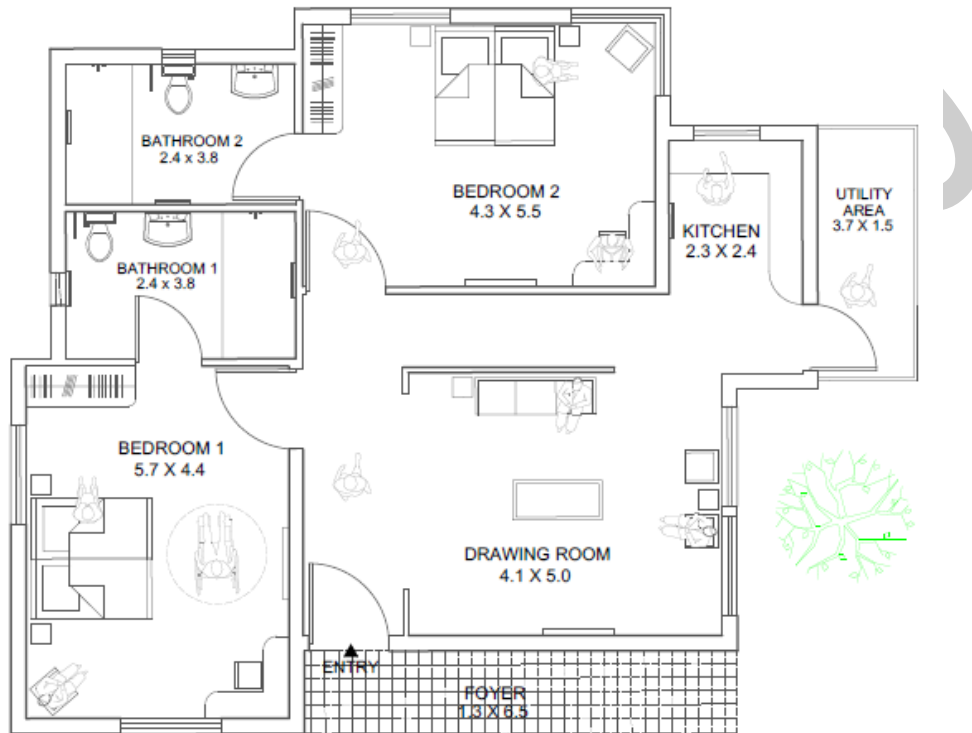
- a) 5.8 litres
- b) 8.6 litres
- c) 6.8 litres
- d) 8.5 litres

UNIT 5: APARTMENT FLOOR PLAN

Roshni is planning to purchase a flat in a nearby locality whose floor plan is shown below.

A **scale drawing** or a floor plan is a representation of an actual object or space drawn in two-dimensions. For a floor plan, you can imagine that you are directly above the building and looking down. The lines represent the walls of the building, and the space in between the lines represents the floor.

The scale of a floor plan is a ratio of the length of an object on the plan to the actual length of that object



FLOOR PLAN

Question 18:

The builder offers wooden flooring in the smaller bedroom. Which bedroom gets wooden flooring?

- a) Bedroom 1 _____
- b) Bedroom 2 _____

Question 19:

Given that 1.5 cm on the floor plan is equivalent to 3 m on the actual dimension. Then, the scale of this floor plan is

- a) 1: 2
- b) 1:20
- c) 1:200
- d) 1:2000

Question 20:

If the width of the door of the living room is 0.75 cm on the floor plan, its actual length in metres is

- a) 1.5
- b) 15
- c) 150
- d) 1500

UNIT 6: FABRICS

Polyester, a synthetic fibre, was invented in 1941 by British chemists Whinfield and Tennant Dickson, and become increasingly popular in the 1970's, thanks to the way it was advertised - "*a miracle fibre that can be worn for 68 days straight without ironing, and still look presentable.*" Polyester became known as a cheap and uncomfortable fabric. Unlike synthetic, natural fabrics are breathable and hence more comfortable.

Question 21:

Sameer's mother buys poly-cotton (a blend of polyester and cotton) curtains for home but makes sure that the clothes that Sameer wears are cotton. Some common perceptions about cotton and polyester are listed below.

- (i) Cotton wrinkles easily
- (ii) Cotton absorbs moisture
- (iii) Poly-cotton is easy to wash
- (iv) Poly-cotton is environment friendly
- (v) Poly-cotton is durable

Choose the correction option from the above due to which Sameer's mother prefers to use poly-cotton over cotton fabric for the curtains

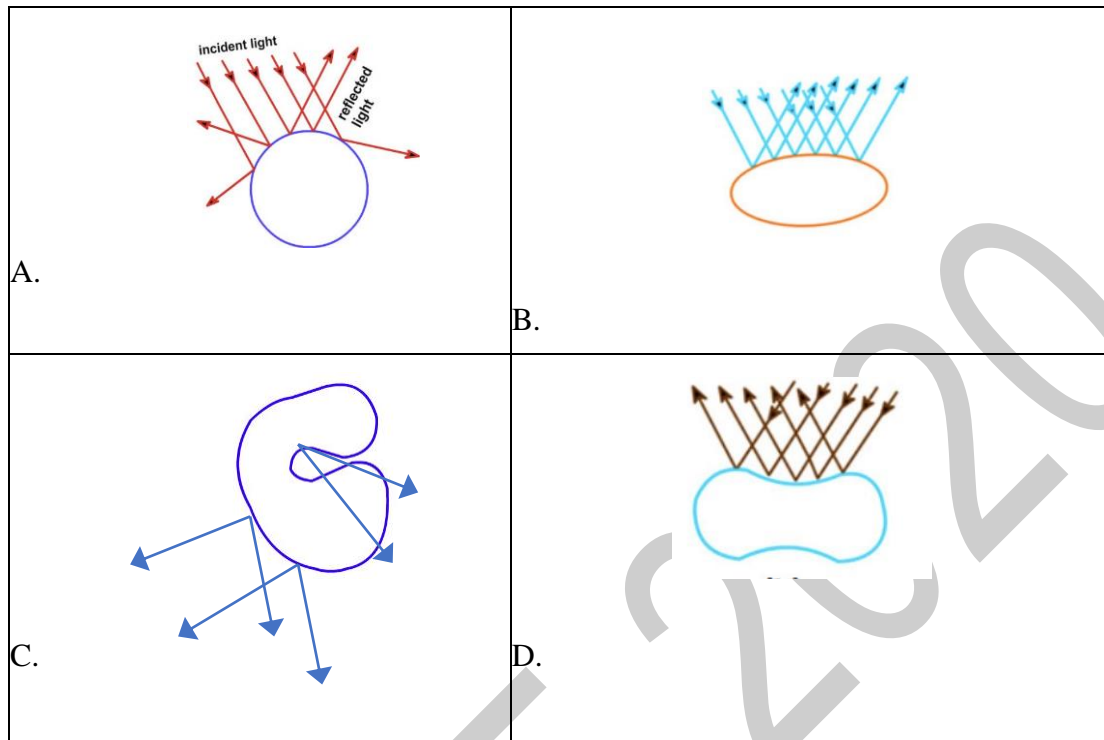
- a) i, ii, iv
- b) i, iii, v
- c) ii, iv, v
- d) i, iv, v

Question 22:

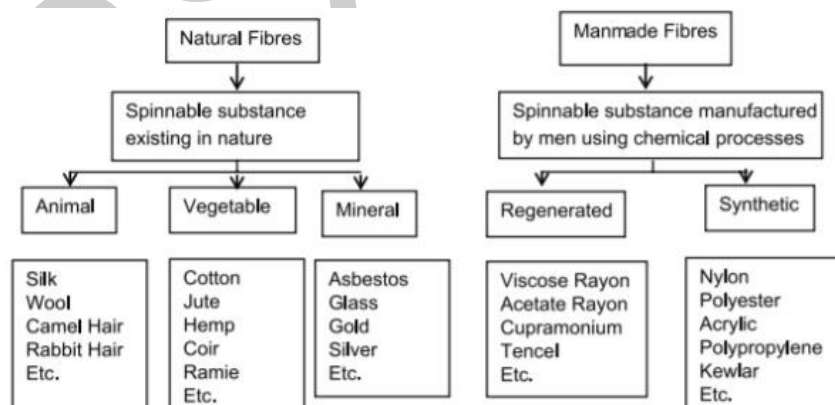
Polyester fabric is lustrous, while cotton is not. Luster depends on the way light is reflected by the fibre and is determined by its cross-sectional shape. Luster is an important aesthetic property related to the reflection of light. For example, Silk is highly lustrous due to uniform cross-sectional area of its fiber. Luster results from the way light is reflected from a surface. The more lustrous a fiber, the more evenly does it reflect the incident light. Thus, the cross-sectional shapes which can reflect the incident light most evenly will give a strong luster. But,

when the fiber or filament is twisted upon itself in the yarn and fabric, the incident light is not reflected as evenly and it results in a softer luster.

The cross-sectional shapes of various fibres are given below. Which one of the following is most likely the cross-sectional shape of a cotton fibre?



Question 23:



The figure gives a categorization of types of fibers.

Based on the figure, choose the correct statement from below.

- a) Polyester is a man-made regenerated fiber.
- b) Rayon is a natural plant fiber.
- c) Asbestos is a natural mineral fiber.
- d) Silk is an artificial fiber.

Question 24:

On doing the comparative study of natural and synthetic fibres, the following observations have been made.

Properties	Natural			Synthetic		
	Cotton	Silk	Wool	Polyester	Nylon	Acrylic
Tensile strength	Strong	Strong	Weak	Very strong	Very strong	Strong
Moisture Absorption	Good	Good	Good	Hydrophobic	Hydrophobic	Hydrophobic
Thermal Behavior	Heat resistant	Heat sensitive	Heat sensitive	Heat sensitive	Heat sensitive	Heat sensitive

Read the observations carefully and think if you “Agree” or “Disagree” with the statements

- i. Heat sensitive fibers are thermosetting
- ii. The moisture absorption ability of the fibre affects its flammability
- iii. Synthetic fibres are more long-lasting/durable

Now choose the correct option from below:

- a) i. Agree, ii. Agree, iii. Agree
- b) i. Disagree, ii. Disagree, iii. Disagree
- c) i. Disagree, ii. Disagree, iii. Agree
- d) i. Disagree, ii. Agree, iii. Agree

Question 25:

A team of British scientists is developing “intelligent” clothes that will give disabled children the power of “speech”. Children wearing waistcoats made of a unique electrotextile, linked to a speech synthesiser, will be able to make themselves understood simply by tapping on the touch-sensitive material.

The material is made up of normal cloth and an ingenious mesh of carbon-impregnated fibres that can conduct electricity. When pressure is applied to the fabric, the pattern of signals that passes through the conducting fibres is altered and a computer chip can work out where the cloth has been touched. It then can trigger whatever electronic device is attached to it, which could be no bigger than two boxes of matches.

“The smart bit is in how we weave the fabric and how we send signals through it – and we can weave it into existing fabric designs so you cannot see it’s in there,” says one of the scientists.

Without being damaged, the material can be washed, wrapped around objects or crushed. The scientist also claims it can be mass-produced cheaply.

Source: Steve Farrer, 'Interactive fabric promises a material gift of the garb', *The Australian*, 10 August 1998

Can these claims made in the article be tested through scientific investigation in the laboratory?

The material can be	Can the claim be tested through scientific investigation in the laboratory?
Washed without being damaged.	Yes / No
Wrapped around objects without being damaged.	Yes / No
Crushed without being damaged.	Yes / No
Mass-produced cheaply.	Yes / No

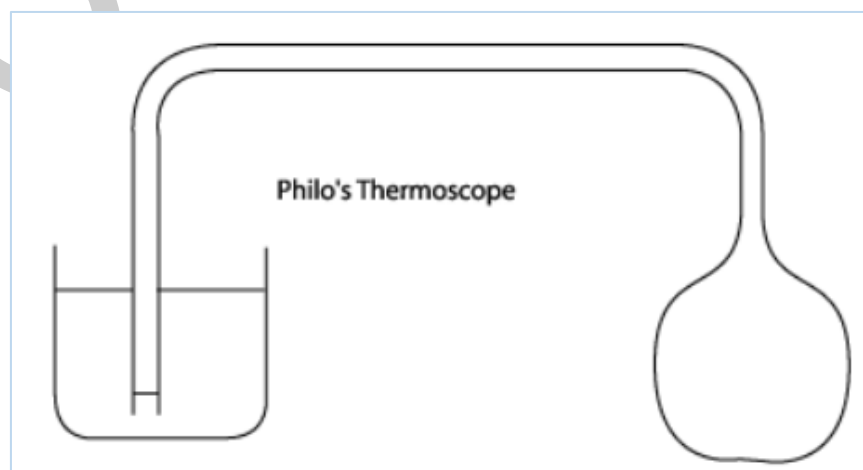
Select the correct option from below:

- a) Yes, Yes, Yes, No
- b) Yes, Yes, No, No
- c) Yes, No, Yes, No
- d) No, Yes, Yes, No

UNIT 7: THERMOMETERS

The thermometer is one of the first measuring instruments with which we become familiar; nevertheless, the accurate measurement of temperature is a rather new concept, dating back only 150 to 250 years ago. A thermometer is an instrument that measures temperature. It can measure the temperature of a solid such as food, a liquid such as water, or a gas such as air. The three most common units of measurement for temperature are *Celsius*, *Fahrenheit*, and *Kelvin*.

The first step in making a thermometer was probably taken from thermoscope in the second century BC, by Philo of Byzantium.



His experimental setup comprised a hollow lead sphere connected with a tight seal to one end of a pipe, while the other end of the pipe was kept under water in another vessel. Philo took the following steps to measure the hotness and coldness of the hollow lead sphere.

- He put the sphere outside in the sunlight and saw that some of the air enclosed in the tube passed out when the sphere became hot. He saw that the air descended from the tube into the water, producing a lot of bubbles.
- Then the sphere is put back in the shade, that is, where the sun's rays do not reach it and he saw that the water rose along the neck of the tube.
- He repeated this method many times to see the same thing happening. He used many different methods to heat the sphere, with fire, or even pouring hot water over it. The result remained the same.

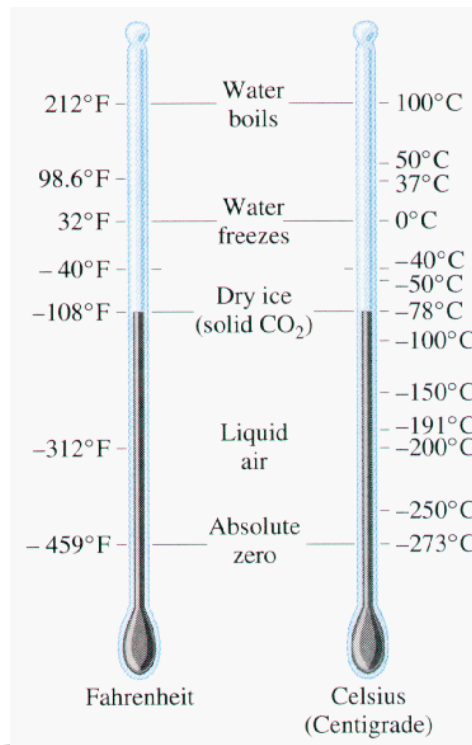
Question 26: According to his observation, which of the following options would be correct.

- a) There is a direct relationship between the rise of the water in the tube to the heating of the lead sphere.
- b) There is an inverse relationship between the rise of the water in the tube to the heating of the lead sphere.
- c) There is no relationship between the rise of the water in the tube to the heating of the lead sphere.
- d) Difference in air pressure affects the rise of water in the tube.

Question 27: Based on the information given in the experimental setup of Philo, which of the following options would be true.

- i. This is not a thermometer because we cannot estimate the hotness or coldness of the lead sphere with any numbers or units.
 - ii. Yes this is a thermometer because we have enough information to understand the hotness and coldness of the thermometer.
 - iii. This entire experiment does not give us any idea of the measuring hotness or coldness of the body.
 - iv. Rising of mercury in the thermometer works on same principle as of rising of water in the tube.
- a) i and ii
 - b) i and iii
 - c) ii and iv
 - d) i and iv

Question 28:



The above figure shows two thermometers, one is a Fahrenheit scale and the other in Celsius (Centigrade) scale. There are certain temperatures marked for some processes like freezing of water, boiling of water etc.

Statement: The special processes like freezing of water, boiling of water etc. are marked in this figure for both the scales.

Reason: This makes us aware of a mathematical relationship between the two temperature scales.

Choose from the following, the correct option for the Statement and Reason.

- Statement is true but Reason is false.
- Both Statement and Reason are true and Reason is the correct explanation of Statement.
- Statement is false but Reason is true.
- Both Statement and Reason are true but Reason is not the correct explanation of Statement.
- Both Statement and Reason are false.

Question 29: Based on the figure we can make the following table.

Observation of Process	Fahrenheit Scale	Celsius Scale
Boiling of Water	212°F	100°C
Freezing of Water	32°F	0°C
Same in both scale	-40°F	-40°C

Based on the values given above, which of the following mathematical relations between Fahrenheit and Celsius scale would be correct?

- a) $\frac{F}{9} = \frac{C - 10}{6}$
- b) $\frac{C}{5} = \frac{F - 32}{9}$
- c) $F = C + 180$
- d) No relation is possible between the two scales.

Question 30: The absolute scale of temperature is Kelvin. Water freezes at 273 K. and boils at 373 K. Hence find out the value of 40°C temperature in Kelvin scale.

- a) 233 K
- b) 323 K
- c) 300 K
- d) 313 K
