

## LOGICAL REASONING

1. Select the option which will replace the question mark in the given number series.

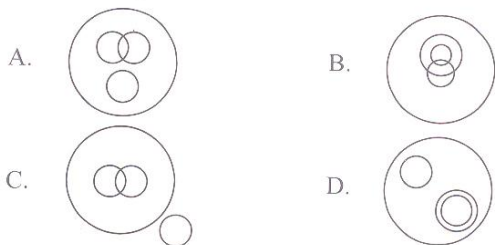
10, 100, 200, 310, ?

- A. 400                                      B. 410  
C. 420                                      D. 430

2. Mr. 'X' shows three photographs to Mr. 'Y'. Pointing towards photograph 1, he says, "The person in photograph 1 is my uncle, who says 'uncle' to the person in photograph 2, and the person in photograph 3 is called 'uncle' by the person in photograph 2." How is Mr. 'X' related to the person in photograph 2?

- A. Grandson  
B. Granddaughter  
C. Great grandson  
D. None of these

3. At a dinner party, both fish and meat were served. Some took only fish while some took only meat. There were some vegetarians also who did not accept either of the two, while the rest accepted both fish and meat. Which of the following Venn diagrams correctly represents this situation?

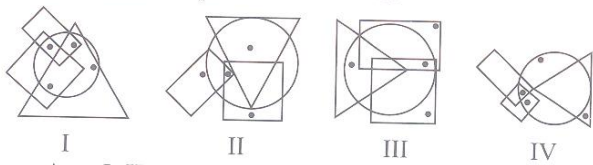


4. Six people P, Q, R, S, T and U are sitting on the ground in a hexagonal shape. All the sides of the hexagon, so formed, are of same length. P is not adjacent to Q or R; S is not adjacent to R or T; Q and R are adjacent; U is in the middle of S and R.

Who is at the same distance from S as T is from S?

- A. Q  
B. R  
C. U  
D. Can't be determined

5. Select the pair of figures which satisfies the same conditions of placement of dots.



- A. I, II                                      B. II, III  
C. III, IV                                      D. I, IV

6. If the alphabets are written in the reverse order after interchanging alphabets from 'D to L' with those from 'R to Z' respectively, which letter would be midway between W and E in the new order?

- A. Z    B. N  
C. D    D. None of these

7. If Fig. (X) is rotated one step in a particular direction, then identify its rotated form, from the given option figures.

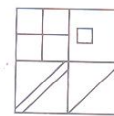
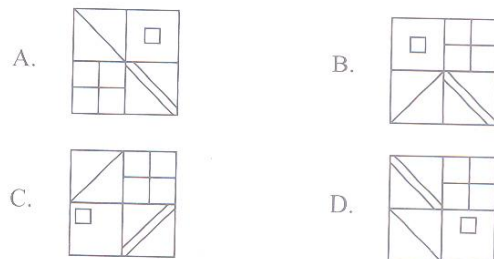
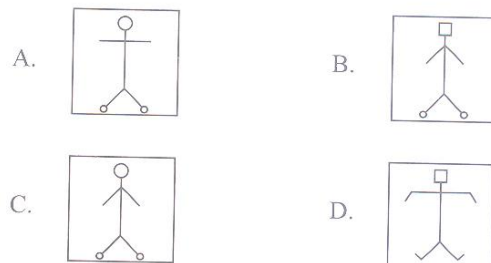
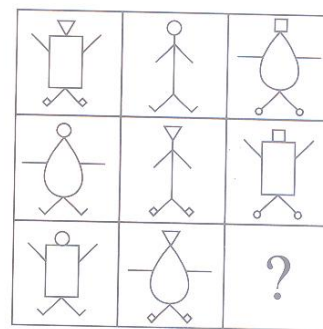


Fig. (X)



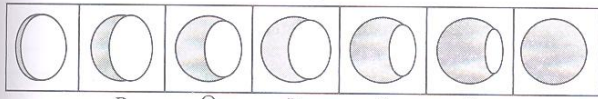
8. Select a figure from the given options which will complete the given figure matrix.



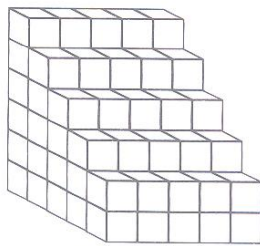
9. Three of the following four numbers are alike in a certain way and so form a group. Which of the following does not belong to that group?

- A. 143    B. 399  
C. 759    D. 257

10. There are seven figures, the first and last of which are unmarked and remaining are marked as P, Q, R, S and T. However, the series will be established only if the positions of two of the marked figures are interchanged. Find the figures.



- A. PQ  
B. QR  
C. QT  
D. ST
11. A pile of cubes of equal size is arranged in the form of a block as shown in the figure. If the block is dipped into a bucket filled with red paint, so that only the surfaces of the block get coloured, then how many cubes are coloured on three faces only?



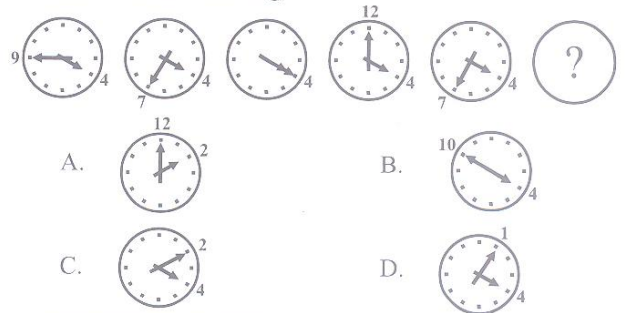
- A. 14  
B. 15  
C. 16  
D. 12
12. Two series in two rows are given below. In the first row, a full series is given which follows a specific pattern. The second row has a series, similar to the first series but only first element of this series is given, followed by (a), (b), (c), (d) and (e), representing the subsequent elements. Complete the series and answer the question that follows :

7	24	10	33	14.5	46.5
11	(a)	(b)	(c)	(d)	(e)

What will come in place of (b)?

- A. 21  
B. 23.5  
C. 19.5  
D. 16

13. There are five different successive figures showing movement of the hands in a clock. Identify the pattern and find the next figure.



- A.   
B.   
C.   
D.
14. In a code language, each of the vowels, i.e., A, E, I, O and U, is substituted by the letter preceding it, while a consonant is substituted by the nearest vowel. How can the word EVIDENCE be written in that code?
- A. DUHJEDOED  
B. DUHEDUAD  
C. DUJEDOAD  
D. DUHEDOAD OR DUHEDOED

15. At my farmhouse I am facing East, then I turn left and walk 10 metres. I again turn right and walk 5 metres. Again I go 5 metres towards the South, and from there walk 5 metres towards the West. In which direction am I from my farmhouse?

- A. East  
B. West  
C. North  
D. South

## SCIENCE

16. When a constant force acts on a mass, and the mass starts moving from rest, then the
- acceleration is constant
  - velocity increases at a constant rate
  - distance travelled is directly proportional to the time.

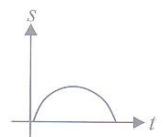
Which of the above statements is/are correct?

- A. (i) only  
B. (i) and (ii) only  
C. (i) and (iii) only  
D. (ii) and (iii) only

17. Which planet is called the morning star as well as the evening star, depending on its position with respect to the sun?

- A. Mercury  
B. Venus  
C. Mars  
D. Saturn

18. The displacement-time graph of a body in motion is shown here. The corresponding velocity-time graph will be



- A.   
B.   
C.   
D.

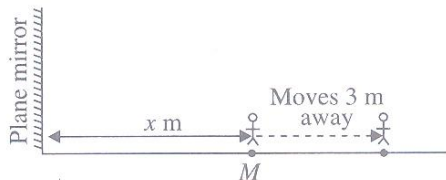


19. A man standing in front of a large wall, claps two objects against each other at an interval of 1.2 s regularly. The echo of the first clap coincides with the fifth clap. If the speed of sound in air is  $340 \text{ ms}^{-1}$ , the distance between the man and the wall is \_\_\_\_.
- A. 408 m                      B. 1632 m  
C. 816 m                      D. 204 m

20. The image formed by the side-view mirror of an automobile is
- (i) of the same size as that of object  
(ii) virtual and diminished  
(iii) erect and real  
(iv) erect and magnified.

Which of the following statements is/are correct?

- A. (i) only                      B. (ii) only  
C. (i) and (iii) only        D. (iii) and (iv) only
21. The diagram shows a man standing at a position *M* in front of a plane mirror, a distance of *x* m from the mirror.



When the man moves 3 m away from the mirror, the new distance between the man and his image becomes 12 m. What is the value of *x*?

- A. 1 m                      B. 2 m  
C. 3 m                      D. 4 m
22. A substance in gaseous form is being cooled to solid state. Its temperature will remain constant when the substance is
- (i) in condensing phase  
(ii) in freezing phase  
(iii) at thermal equilibrium with the environment.
- A. (i) only                      B. (iii) only  
C. (i) and (ii) only        D. (i), (ii) and (iii)
23. During a track and field meet, the time difference between seeing the smoke from a starter's gun and hearing the bang would be less \_\_\_\_.
- A. On a warmer day  
B. On a cooler day  
C. If a more powerful shell were used  
D. If a less powerful shell were used

24. Read the given statements and mark the correct option.
- Statement-1** : A convex mirror always forms a real image.  
**Statement-2** : A diverging beam incident on a convex mirror is reflected as a diverging beam.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.  
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.  
C. Statement 1 is false but statement 2 is true.  
D. Both statements 1 and 2 are false.

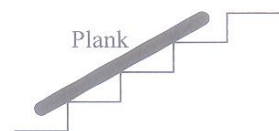
25. A cube of side 0.2 m rests on the floor, as shown. Given that the cube has a mass of 50 kg, the pressure exerted by the cube on the floor is \_\_\_\_.
- (Take  $g = 10 \text{ N kg}^{-1}$ )



- A.  $25 \text{ N m}^{-2}$                       B.  $250 \text{ N m}^{-2}$   
C.  $1250 \text{ N m}^{-2}$                       D.  $12500 \text{ N m}^{-2}$

26. In an electrical circuit containing a battery, the positive charge inside the battery \_\_\_\_.
- A. always goes from positive terminal to the negative terminal  
B. may go from positive terminal to negative terminal  
C. always goes from the negative terminal to positive terminal  
D. does not move

27. A plank is supported on the steps of a staircase as shown in the figure. How many forces are acting on the plank?



- A. 4  
B. 5  
C. 6  
D. 7

28. How do cyclones decrease the fertility of soil in the coastal areas?
- A. By flooding the land with saline water.  
B. By dissolving soil and rocks.  
C. By increasing the water table of the place.  
D. By decreasing the water table of the place.

29. Read the given statements and select the correct option.

**Statement-1** : Petroleum is called 'black gold'.

**Statement-2** : Petroleum is a dark oily liquid.

- A. Both statements 1 and 2 are true but statement 2 is the correct explanation of statement 1.  
B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.  
C. Statement 1 is true but statement 2 is false.  
D. Both statements 1 and 2 are false.

30. Read the table carefully.

S. No.	Reaction	Product formed	Characteristic test
1.	Copper vessel exposed to moist air.	Green coating	Turns red litmus solution blue.
2.	Aluminium foil dipped in fresh solution of sodium hydroxide.	Colourless, odourless gas	Burns with a pop sound.
3.	Rusting of iron.	Reddish brown deposit	Turns red litmus solution blue.
4.	Burning of sulphur powder.	Colourless, suffocating gas	Turns blue litmus solution red.

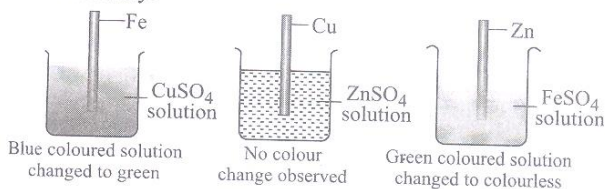
Identify the products formed and their nature.

- A. (1)  $\text{Cu}(\text{OH})_2$ ,  $\text{CuCO}_3$ ; basic (2)  $\text{H}_2$ ; neutral  
 (3)  $\text{Fe}_2\text{O}_3$ ; basic (4)  $\text{SO}_2$ ; acidic
- B. (1)  $\text{CuO}$ ; basic (2)  $\text{O}_2$ ; neutral  
 (3)  $\text{Fe}_3\text{O}_4$ ; basic (4)  $\text{H}_2\text{S}$ ; acidic
- C. (1)  $\text{Cu}(\text{OH})_2$ ,  $\text{CuCO}_3$ ; basic (2)  $\text{H}_2$ ; neutral  
 (3)  $\text{Fe}_2\text{O}_3$ ; acidic (4)  $\text{SO}_2$ ; basic
- D. (1)  $\text{Cu}$ ; basic (2)  $\text{H}_2\text{O}$ ; neutral  
 (3)  $\text{FeO}$ ; basic (4)  $\text{SO}_3$ ; basic

31. Which of the following examples are periodic changes?

- I. Occurrence of eclipse.  
 II. The flowering of jasmine bush.  
 III. Occurrence of new moon.  
 IV. Opening and closing of stomata.  
 V. Appearance of rainbow.  
 VI. Rotation of earth.  
 VII. Blinking of eyes.  
 VIII. Twinkling of stars.
- A. I, V, VII and VIII  
 B. I, II, III and IV  
 C. II, III, IV and VI  
 D. All are non-periodic changes.

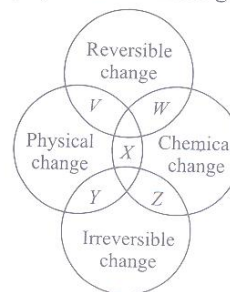
32. Neha, a class VIII student arranged the following experimental set-up and observed the changes carefully.



On the basis of her observations identify the correct order of reactivity.

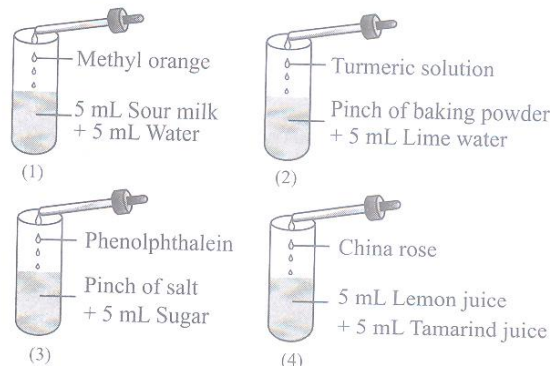
- A.  $\text{Zn} > \text{Cu} > \text{Fe}$  B.  $\text{Zn} > \text{Fe} > \text{Cu}$   
 C.  $\text{Fe} > \text{Zn} > \text{Cu}$  D.  $\text{Cu} > \text{Fe} > \text{Zn}$

33. Identify V, W, X, Y and Z in the given Venn diagram.



	V	W	X	Y	Z
A.	Filling a water bottle	Withdrawing money from ATM	Burning a candle	Charging mobile battery	Boiling an egg
B.	Filling a water bottle	Charging mobile battery	Burning a candle	Withdrawing money from ATM	Boiling an egg
C.	Burning a candle	Charging mobile battery	Filling a water bottle	Boiling an egg	Withdrawing money from ATM
D.	Boiling an egg	Filling a water bottle	Withdrawing money from ATM	Charging mobile battery	Burning a candle

34. Different mixtures are taken in four different test tubes and each of them is tested with indicators as shown below :



Select the incorrect observation.

- A. No change in colour in test tubes 1 and 3.  
 B. Turmeric solution turns red in test tube 2.  
 C. China rose turns magenta in test tube 4.  
 D. None of the above

35. Match the articles given in Column-I with the fibres/plastics from which they are made in Column-II.

- | Column-I                  | Column-II    |
|---------------------------|--------------|
| (a) Toothbrush bristles   | (i) Melamine |
| (b) Carpet                | (ii) PVC     |
| (c) Bottle                | (iii) Nylon  |
| (d) Toy                   | (iv) Rayon   |
| (e) Fire resistant fabric | (v) PET      |
- A. (a)-(i), (b)-(iv), (c)-(ii), (d)-(v), (e)-(iii)  
 B. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i), (e)-(v)  
 C. (a)-(iii), (b)-(iv), (c)-(v), (d)-(ii), (e)-(i)  
 D. (a)-(iii), (b)-(v), (c)-(iv), (d)-(i), (e)-(ii)



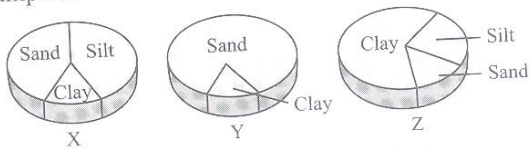
36. The manufacture of bread, beer and wine involves alcoholic fermentation of glucose to ethanol by yeast. Which of the following five statements concerning this process are correct?

- I. Yeast carries out fermentation because yeast cells lack mitochondria.
  - II. For every molecule of ethanol produced, one molecule of  $\text{CO}_2$  evolves.
  - III. For every one molecule of glucose fermented, net two molecules of ATP are generated.
  - IV. More than 80% of the chemical energy of the glucose is released as heat.
  - V. Glycolysis is an integral part of this fermentation.
- A. II, III and IV                      B. I, II, III and V  
C. II, III and V                        D. I, IV and V

37. Thyroxine controls \_\_\_\_\_ in frogs and the development of \_\_\_\_\_ and \_\_\_\_\_ during embryonic development of other vertebrates. Thyroxine production requires the presence of \_\_\_\_\_ in diet. Select the correct sequence of words to complete the above passage.

- A. Development, Circulatory system, Muscles, Iodine
- B. Metamorphosis, Circulatory system, Muscles, Calcium
- C. Development, Bones, Nervous system, Iron
- D. Metamorphosis, Bones, Nervous system, Iodine

38. The given pie charts show the composition of three types of soil samples X, Y and Z. Which of the following is correct regarding these soil samples?



- A. X is unable to hold water or nutrients.
- B. Y is used for pot making.
- C. Z provides good aeration to plant roots.
- D. X is best suited for cultivation.

39. Read the given statements and select the correct option.

**Statement-1** : Chloroplast and mitochondria are semi-autonomous organelles.

**Statement-2** : Chloroplast and mitochondria have their own DNA and protein synthesizing machinery.

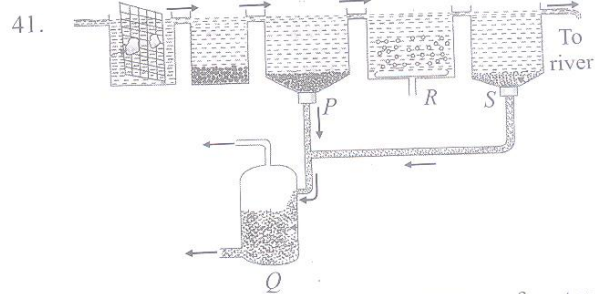
- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- C. Statement 1 is true and statement 2 is false.
- D. Both statements 1 and 2 are false.

40. The names of some plants are given below in the list :

- |                  |                      |
|------------------|----------------------|
| I. Lady's finger | VI. Grass            |
| II. Drumstick    | VII. <i>Xanthium</i> |
| III. Balsam      | VIII. Madar          |
| IV. <i>Urena</i> | IX. Sunflower        |
| V. Maple         | X. Coconut           |

Match these plants with the mode of dispersal of their fruits/seeds and select the correct option.

	Wind	Animals	Water	Bursting of fruits
A.	II, V, VI, VIII, IX	III, IV, VII	X	I
B.	II, V, VI, VIII, IX	IV, VII	X	I, III
C.	V, VI, IX	II, IV, VII	X	I, III, VIII
D.	II, VI, VII, VIII	I, IX	X	III, IV, V



Some steps involved in the treatment of water in a wastewater treatment plant are labelled as P, Q, R and S in the above diagram. The table given below shows (✓) for those steps in which the particular process is occurring while (X) for those in which it is not occurring. Which among these is/are incorrect?

	Process	P	Q	R	S
I.	Sludge removal	✓	✓	X	✓
II.	Anaerobic decomposition	X	✓	X	X
III.	Cleaning of clarified watery waste	X	X	✓	✓
IV.	Disinfection of treated water	X	X	X	✓

- A. I and II
- B. III and IV
- C. II only
- D. None of these

42. According to the extent of threat to a species and its population in its natural habitat, four categories have been identified which are given below :

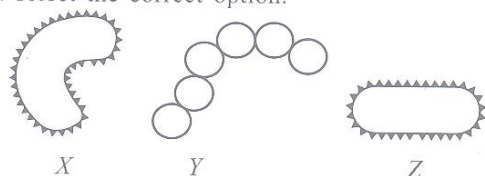
- I. Extinct in wild
- II. Critically endangered species
- III. Vulnerable species
- IV. Endangered species

Select the correct order of these species according to their conservation priority?

- A. II > IV > I > III
- B. I > II > IV > III
- C. III > I > II > IV
- D. I > IV > III > II



43. Refer to the given figures of bacteria (X, Y and Z) and read the statements I, II & III regarding these. Based on the given information, identify the bacterium and select the correct option.



- I. Bacteria X causes cholera.  
 II. Bacteria Y causes a disease which disrupts proper exchange of gases.  
 III. Bacteria Z converts lactose sugar of milk to lactic acid.
- A. X is *Vibrio cholerae*.      B. Z is *Lactobacillus*.  
 C. Y is *Salmonella typhi*.      D. Both A and C

44. Following investigation was carried out using flower buds growing on three plants of the same species.
- Plant X → The anthers were carefully removed, and the buds left open to the air.  
 Plant Y → The anthers were left untouched, and a paper bag was tied tightly around each bud.

Plant Z → The anthers were carefully removed, and a paper bag was tied tightly around each bud.

Although all flowers later bloomed normally, only those on plant X, produced seeds. This result showed that in this species \_\_\_\_\_ pollination can take place.

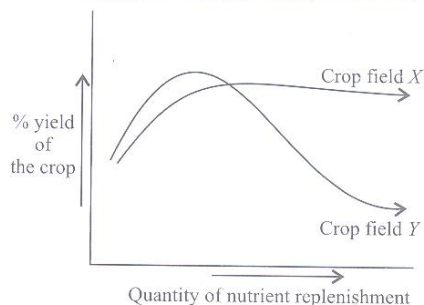
- A. Only insect                      B. Only cross  
 C. Only wind                      D. Either of A, B or C

45. Match Column I with Column II and select the correct option from the codes given below.

Column I		Column II		
(a) SPM	(i) Poisoning of bald eagles			
(b) Typhoid	(ii) Green house gas			
(c) CO	(iii) Vehicle exhaust			
(d) CO <sub>2</sub>	(iv) Incomplete combustion			
(e) DDT	(v) Pathogens in polluted water			
a	b	c	d	e
A. iii	v	ii	iv	i
B. i	iii	iv	ii	v
C. iii	iv	v	ii	i
D. iii	v	iv	ii	i

### ACHIEVERS SECTION

46.

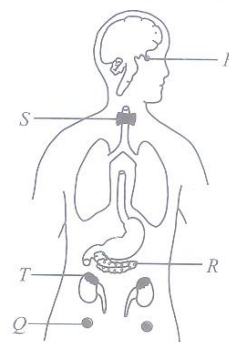


The given graph shows two crop fields (X and Y) that have been treated by different types of materials for nutrient replenishment, keeping other environmental factors same. Given are some assumptions regarding the crop fields and the materials used. Select the most correct one(s).

- I. Addition of chemical fertilizers in Y has resulted in sudden increase in yield due to increased release of N, P, K nutrients, but it gradually declined as continuous use of chemicals killed useful microbes that replenish the soil fertility.  
 II. The difference in the two graphs indicates that the crop fields X and Y are treated with fertilizer and manure respectively, as fertilizer is beneficial for long time and gives durable yield whereas manure gives immediate yield but later causes problems.  
 III. The highest peak in crop field X is slightly delayed because manure enriches soil fertility gradually.

- A. I and II                      B. II only  
 C. III only                      D. I and III

47. A large number of functions are performed by different hormones secreted by endocrine glands. Match the given functions (a, b, c, d and e) to the labelled glands in the figure and select the correct option.

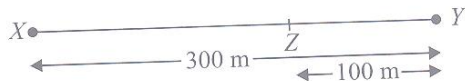


- a. Maintains a steady level of glucose in the blood.  
 b. Helps in the growth of human body and also sends signals to other organs to secrete hormones.  
 c. Controls secondary sexual characters and maintains pregnancy.  
 d. Controls rate at which food is oxidised by the cells to produce energy.  
 e. Increases blood pressure and heart rate, when the body experiences stress.
- |      |   |   |   |   |
|------|---|---|---|---|
| a    | b | c | d | e |
| A. R | P | Q | T | S |
| B. P | R | Q | S | T |
| C. S | P | Q | R | T |
| D. R | P | Q | S | T |



Direction (Q.No. 48 and 49): Refer to the given passage and answer the following questions:

Ram jogs from one end  $X$  to the other end  $Y$  of a straight 300 m road in 2 minutes 30 seconds, and then turns around and jogs 100 m back to point  $Z$  in another 1 minute.



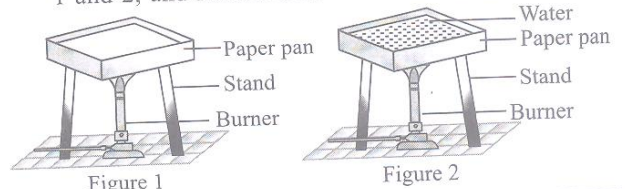
48. What is Ram's average speed and average velocity while jogging from  $X$  to  $Y$  respectively?

- A.  $1.0 \text{ m s}^{-1}$ ,  $1.0 \text{ m s}^{-1}$
- B.  $3.0 \text{ m s}^{-1}$ ,  $2.0 \text{ m s}^{-1}$
- C.  $2.0 \text{ m s}^{-1}$ ,  $2.0 \text{ m s}^{-1}$
- D.  $4.0 \text{ m s}^{-1}$ ,  $1.0 \text{ m s}^{-1}$

49. What is Ram's average speed and average velocity while jogging from  $X$  to  $Z$  respectively?

- A.  $2.0 \text{ m s}^{-1}$ ,  $1.9 \text{ m s}^{-1}$
- B.  $5.1 \text{ m s}^{-1}$ ,  $9.1 \text{ m s}^{-1}$
- C.  $1.0 \text{ m s}^{-1}$ ,  $1.0 \text{ m s}^{-1}$
- D.  $1.9 \text{ m s}^{-1}$ ,  $0.9 \text{ m s}^{-1}$

50. Sakshi performed two experiments as shown in figure 1 and 2, and recorded her observations in the table.



Observation	Does paper pan burn?		Is ignition temperature of paper reached?	
	Figure 1	Figure 2	Figure 1	Figure 2
I	Yes	Yes	No	Yes
II	Yes	No	Yes	No
III	No	Yes	Yes	Yes

Find out the correct observation and the reason behind it from the options given below.

- A. I, paper has a higher ignition temperature than water.
- B. II, fireproof paper pan is used in figure 2.
- C. III, paper is non-inflammable.
- D. II, heat supplied to the paper pan is transferred to water by conduction, so ignition temperature of paper is not reached in figure 2.

SPACE FOR ROUGH WORK



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Head Office: Plot No. 99, Sector 44, Gurgaon - 122 003 (HR) | Email: [info@sofworld.org](mailto:info@sofworld.org) | Website: [www.sofworld.org](http://www.sofworld.org)  
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