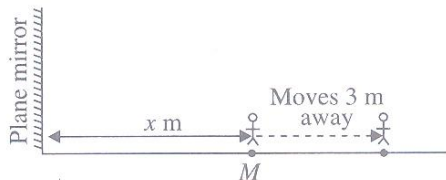


19. A man standing in front of a large wall, claps two objects against each other at an interval of 1.2 s regularly. The echo of the first clap coincides with the fifth clap. If the speed of sound in air is 340 ms^{-1} , the distance between the man and the wall is ____.
- A. 408 m B. 1632 m
C. 816 m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

20. The image formed by the side-view mirror of an automobile is
- of the same size as that of object
 - virtual and diminished
 - erect and real
 - 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
- in condensing phase
 - in freezing phase
 - 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.

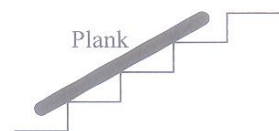
25. A cube of side 0.2 m rests on the floor, as shown. Given that the cube has a mass of 50 kg, the pressure exerted by the cube on the floor is ____.
- (Take $g = 10 \text{ N kg}^{-1}$)



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

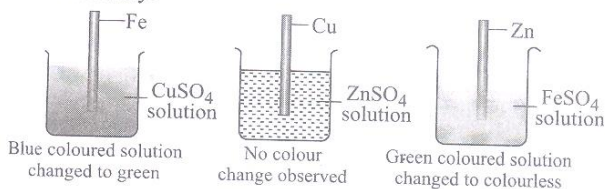
Identify the products formed and their nature.

- A. (1) $\text{Cu}(\text{OH})_2$, CuCO_3 ; basic (2) H_2 ; neutral
 (3) Fe_2O_3 ; basic (4) SO_2 ; acidic
- B. (1) CuO ; basic (2) O_2 ; neutral
 (3) Fe_3O_4 ; basic (4) H_2S ; acidic
- C. (1) $\text{Cu}(\text{OH})_2$, CuCO_3 ; basic (2) H_2 ; neutral
 (3) Fe_2O_3 ; acidic (4) SO_2 ; basic
- D. (1) Cu ; basic (2) H_2O ; neutral
 (3) FeO ; basic (4) 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.

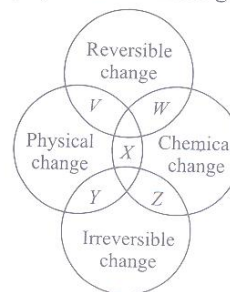
32. Neha, a class VIII student arranged the following experimental set-up and observed the changes carefully.



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

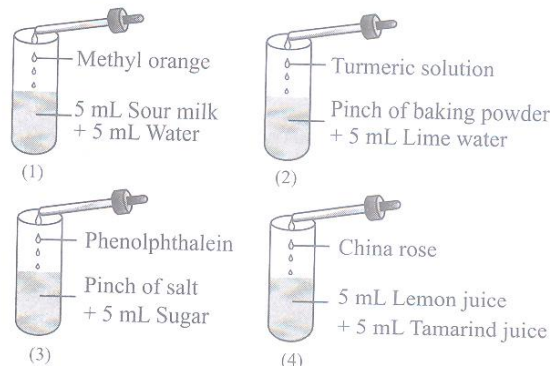
- A. $\text{Zn} > \text{Cu} > \text{Fe}$ B. $\text{Zn} > \text{Fe} > \text{Cu}$
 C. $\text{Fe} > \text{Zn} > \text{Cu}$ D. $\text{Cu} > \text{Fe} > \text{Zn}$

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)

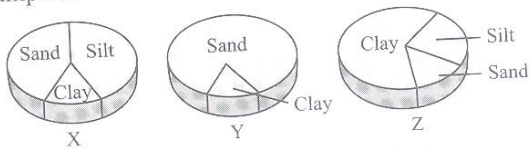
36. The manufacture of bread, beer and wine involves alcoholic fermentation of glucose to ethanol by yeast. Which of the following five statements concerning this process are correct?

- I. Yeast carries out fermentation because yeast cells lack mitochondria.
 - II. For every molecule of ethanol produced, one molecule of 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.

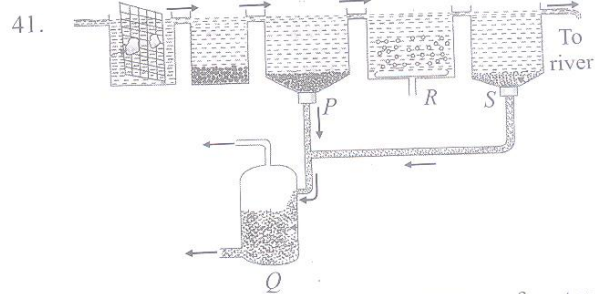
- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.
- B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
- C. Statement 1 is true and statement 2 is false.
- D. Both statements 1 and 2 are false.

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

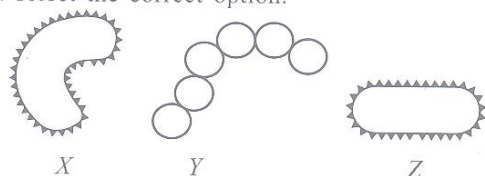
42. According to the extent of threat to a species and its population in its natural habitat, four categories have been identified which are given below :

- 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.

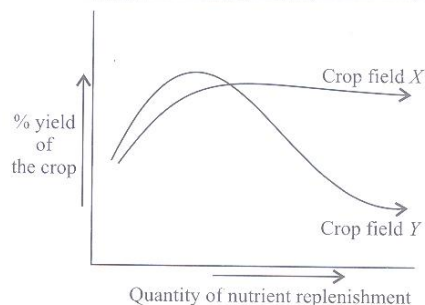
- A. Only insect B. Only cross
 C. Only wind D. Either of A, B or C

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 ₂	(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.

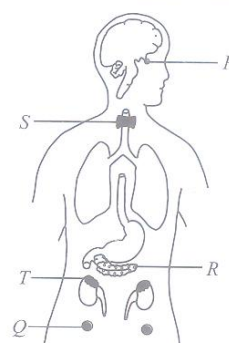


The given graph shows two crop fields (X and Y) that have been treated by different types of materials for nutrient replenishment, keeping other environmental factors same. Given are some assumptions regarding the crop fields and the materials used. Select the most correct one(s).

- 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

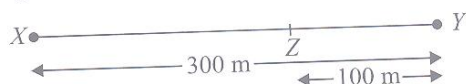
47. A large number of functions are performed by different hormones secreted by endocrine glands. Match the given functions (a, b, c, d and e) to the labelled glands in the figure and select the correct option.



- 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 |

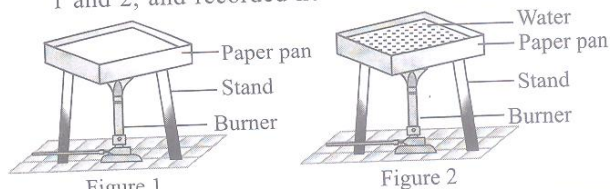
Direction (Q.No. 48 and 49): Refer to the given passage and answer the following questions:

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 m s^{-1} , 1.0 m s^{-1}
 B. 3.0 m s^{-1} , 2.0 m s^{-1}
 C. 2.0 m s^{-1} , 2.0 m s^{-1}
 D. 4.0 m s^{-1} , 1.0 m s^{-1}
49. What is Ram's average speed and average velocity while jogging from X to Z respectively?
- A. 2.0 m s^{-1} , 1.9 m s^{-1}
 B. 5.1 m s^{-1} , 9.1 m s^{-1}
 C. 1.0 m s^{-1} , 1.0 m s^{-1}
 D. 1.9 m s^{-1} , 0.9 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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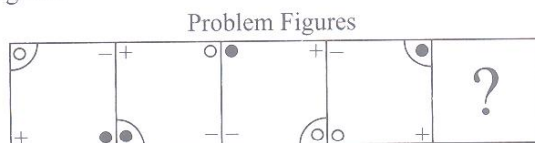
LOGICAL REASONING

1. Find the missing term in the given series.

19200, 1920, 240, 40, 10, ?

- A. 1 B. 5
C. 0 D. 10

2. Select a figure from the options which will continue the same series as established by the four problem figures.



- A. B.
C. D.

3. Six persons Aman, Beenu, Charu, Disha, Esha and Giya took up a job with an organization in a week from Monday to Saturday. Each of them joined for different posts on different days. The posts were of—clerk, officer, technician, manager, supervisor and sales executive, though not necessarily in the same order.

Giya joined as a manager on the first day. Beenu joined as a supervisor but neither on Wednesday nor Friday. Disha joined as a technician on Thursday. Charu joined on Wednesday. Esha joined as a clerk on Tuesday. Aman joined as a sales executive. Which of the following is correctly matched regarding the posts and day of joining?

- A. Manager-Tuesday B. Officer-Wednesday
C. Clerk-Thursday D. Technician-Monday

4. Find the missing character, if the given matrix follows a certain rule, row-wise or column-wise.

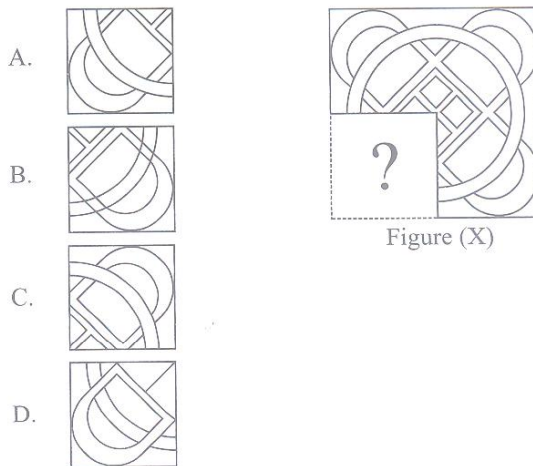
- A. V
B. W
C. X
D. Y

A	D	G
D	I	N
I	P	?

5. If Saturday falls on fourth day after today which is 6th January, then on what day did 1st December of the previous year fall?

- A. Sunday B. Wednesday
C. Tuesday D. Monday

6. Select a figure from the options, which would replace the (?) to complete the pattern in Figure (X).



7. Find the mirror image of Fig. (X), if the mirror is placed vertically to the left.



Fig. (X)

- A. B.
C. D.

8. Garima and Saurabh are children of Mr. Jindal. Garima marries Amit Goel and Sahil, Sameer and Sanchit are born to them. Sahil is married to the eldest daughter of Mr. and Mrs. Mittal.

Kaya is younger to Piya but older than Riya who are the daughters of Mr. and Mrs. Mittal. Latika is Sahil's daughter.

How is Saurabh related to Sanchit?

- A. Brother-in-law B. Uncle
C. Maternal uncle D. Brother

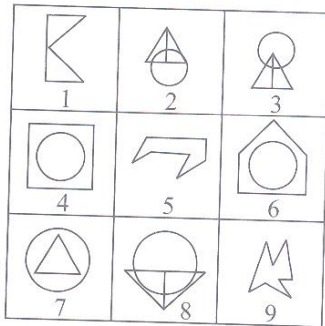
9. In the sequence given below, in some cases the sum of the two digits which immediately precede the digit '3' exceeds the sum of the two digits which immediately follow the digit 3 and sum of the two digits which immediately follow the digit '5' exceeds the sum of the two digits which immediately precede the digit 5. How many such 3's and 5's are there altogether?

2 5 4 3 6 7 5 2 8 3 9 7 5 4 3 4 6 5 2 6 3 5 8 3 5
 2 4 6 3 7 5 8 3 5 2 6

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

10. In a certain code, the word DEAL is coded as 4 - 5 - 1 - 12. Following the same rule of coding, what should be the code for the word LADY?
 A. 12 - 4 - 1 - 25
 B. 12 - 1 - 4 - 25
 C. 10 - 1 - 4 - 23
 D. 12 - 1 - 4 - 22

11. Group the given figures into three classes, using each figure only once.



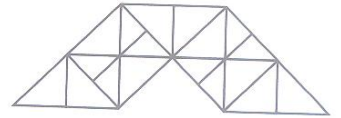
- A. 1, 4, 9; 2, 3, 8; 5, 6, 7
 B. 2, 3, 7; 4, 6, 9; 1, 5, 8
 C. 1, 5, 9; 2, 3, 8; 4, 6, 7
 D. 1, 6, 7; 2, 3, 8; 4, 5, 9

12. P, Q, R, S and T are Banks. Banks P, Q and R have their branches in Meerut and Lucknow. P, Q and T have their branches in Meerut and Gorakhpur. Q, R and S have their branches in Kanpur and Lucknow. P, T and S have their branches in Gorakhpur and Varanasi while R, T and S have their branches at Kanpur and Varanasi.

Which bank has its branch in Kanpur and Meerut but not in Lucknow?

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

13. Find the number of triangles formed in the given figure.

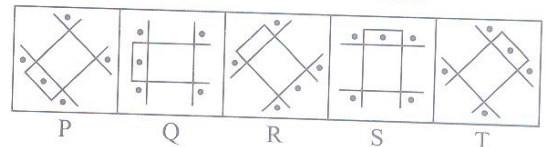


- A. 33
 B. 37
 C. 35
 D. None of these

14. If animals that live on land and the animals that live in water are represented by two big circles and animals that live in water and on land are represented by small circle, the combination of these three can be best represented as



15. Out of the five figures marked (P), (Q), (R), (S) and (T), four are similar in a certain manner. However, one figure is not like the other four. Choose the figure which is different from the rest.



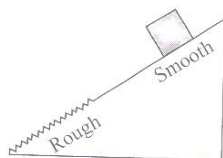
- A. P
 B. Q
 C. R
 D. T

SCIENCE

16. A driver takes 0.20 s to apply brakes soon after he sees a need for it. If he is driving a car at a speed of 54 km h^{-1} and the brakes cause a deceleration of 6.0 m s^{-2} , then the distance travelled by the car, after he sees the need to apply the brakes is _____.

- A. 21.75 m
 B. 42.50 m
 C. 10.55 m
 D. 16.25 m

17. A block accelerates down a slope, as shown in the figure. The upper portion of the slope is smooth and lower portion is rough. On the lower portion,



- (i) the speed of the block may increase, decrease or remain same.

- (ii) the acceleration of block reduces.
 (iii) the mass of block reduces.

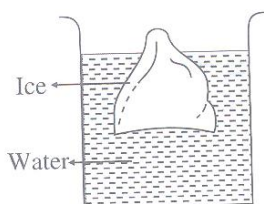
Which of the following is/are correct?

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

18. An aeroplane pilot hears a slow beat from the two engines of his plane. He increases the speed of the right engine and now hears a slower beat. What should the pilot now do, to eliminate the beat?

- A. Increase the speed of the left engine
 B. Decrease the speed of the right engine
 C. Increase the speed of both engines
 D. Increase the speed of the right engine

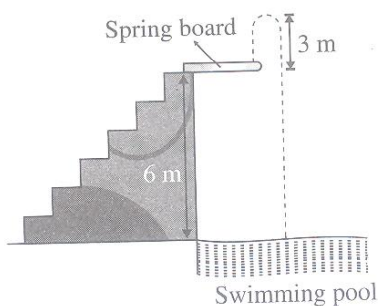
19. A lump of ice floats in water as shown in the figure.



Which of the following statements is correct?

- A. The lump of ice floats because the area of its lower surface is larger than the area of its upper surface.
- B. The pressure difference between the lower and the upper surfaces of the lump of ice gives rise to an upthrust equal to its weight.
- C. The ice has a greater density than water.
- D. The mass of water displaced by ice is equal to the upthrust.
20. At a certain place, value of g is 1% less than its value on the surface of Earth. If the radius of Earth is given to be 6400 km, then the place is _____.
- A. 64 km below the surface of the Earth
- B. 64 km above the surface of the Earth
- C. 30 km above the surface of the Earth
- D. 32 km below the surface of the Earth.
21. If suddenly the gravitational force of attraction between the Earth and a satellite revolving around it becomes zero, then the satellite will _____.
- A. Fall onto the Earth
- B. Move in a direction tangential to its original orbit
- C. Escape horizontally
- D. None of these

22. A man of mass 55 kg climbs up a flight of steps to reach the spring board. The spring board is 6 m above the water surface in a swimming pool as shown in the given figure.



- He jumps up into air, 3 m above the spring board, before falling into water in the swimming pool. If the average resisting force exerted by water on the man is 1500 N, then the maximum depth of the man in water will be
- A. 2.1 m
- B. 3.3 m
- C. 4.2 m
- D. 5.6 m

23. Converging lenses A and B have the same focal length, but B is only half the aperture of A . Both lenses are used to form images of distant objects on a screen. Which of the following statements is correct?

- A. For both lenses, the distance from the lens to the screen is same.
- B. For both lenses, the images are of the same brightness.
- C. For both lenses, the images are of the same size as the object.
- D. Lens B gives a smaller image than A .

24. A plane mirror approaches a stationary person with an acceleration, a . The acceleration of his image, as seen by the person, will be

- A. a
- B. $2a$
- C. $a/2$
- D. $4a$

25. Two objects, A and B are thrown upwards simultaneously with the same speed. The mass of A is greater than the mass of B . Suppose the air exerts a constant and equal force of resistance on the two bodies, then

- A. A will go higher than B
- B. B will go higher than A
- C. The two bodies will reach the same height
- D. None of these.

26. Four students were given small pieces of materials P, Q, R and S respectively. They observed the reactions of these materials as follows :

Material	Reaction with	
	Water	Dilute hydrochloric acid
P	No reaction but catches fire if exposed to air.	No reaction.
Q	Reacts slowly.	Burns with a pop sound.
R	Reacts vigorously with lots of heat.	Burns with a pop sound.
S	No reaction.	No reaction.

According to them, materials P, Q, R and S respectively are

- A. Fe, Cu, Na, P
- B. Na, Fe, P, Cu
- C. P, Fe, Na, Cu
- D. Cu, P, Na, Fe

27. Read the given statements and mark the correct option.

Statement 1 : Food is a fuel for our body.

Statement 2 : In our body, food is broken down by reaction with oxygen and heat is produced.

- 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 but statement 2 is false.
 D. Both statements 1 and 2 are false.

28. Match the Column-I with Column-II and choose the correct option using the codes given below.

Column-I (Mixture)	Column-II (Separation technique)
a. An ink	(i) Distillation
b. Liquid air	(ii) Evaporation and crystallization
c. Copper sulphate and water	(iii) Fractional distillation
d. Acetone and water	(iv) Chromatography

A. a-(i), b-(ii), c-(iii), d-(iv)
 B. a-(ii), b-(iii), c-(i), d-(iv)
 C. a-(iv), b-(i), c-(iii), d-(ii)
 D. a-(iv), b-(iii), c-(ii), d-(i)

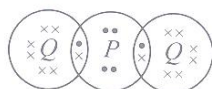
29. Study the table carefully and select the correct statement.

Element	Number of protons	Number of neutrons	Number of electrons
U	11	12	10
V	20	20	20
W	16	18	18
X	20	19	18
Y	14	15	18
Z	10	10	10

- A. W is a noble gas.
 B. X and Y are cations.
 C. U and V are anions.
 D. Z is the lightest element while V is the heaviest.

30. Which of the following statements are incorrect?
 I. Rayon is a natural fibre as it is obtained by chemical treatment of wood pulp.
 II. Plastics which cannot be softened by heating are called thermoplastics.
 III. Nylon is semi-synthetic fibre.
 IV. Plastics which get deformed easily on heating are known as thermosetting plastics.
 A. I and III
 B. I, II and III
 C. II, III and IV
 D. All of these

31. A compound, PQ_2 has the following arrangement of electrons :



The elements P and Q are respectively

- A. N, Cl
 B. Cl, S
 C. O, F
 D. Na, F

32. The calorific values of some fuels are given.

Fuel	Calorific value (kJ/kg)
Coal	25000 – 33000
Diesel	45000
LPG	55000
CNG	50000

On the basis of given data, the correct order of efficiency of different fuels is

- A. LPG > CNG > Diesel > Coal
 B. Coal > Diesel > LPG > CNG
 C. Diesel > CNG > Coal > LPG
 D. CNG > LPG > Diesel > Coal

33. Three students Ankit, Dinesh and Manoj were given three unknown substances X, Y and Z respectively during the lab activity.

Substance	Property	
	Boiling point (°C)	Solubility in water
X	56	Soluble
Y	45	Insoluble
Z	90	Soluble

On the basis of these properties, which student has chosen the correct separation technique, to separate a substance from the substance-water mixture?

- A. Ankit – Separating funnel
 B. Dinesh – Distillation
 C. Manoj – Fractional distillation
 D. All are correct.

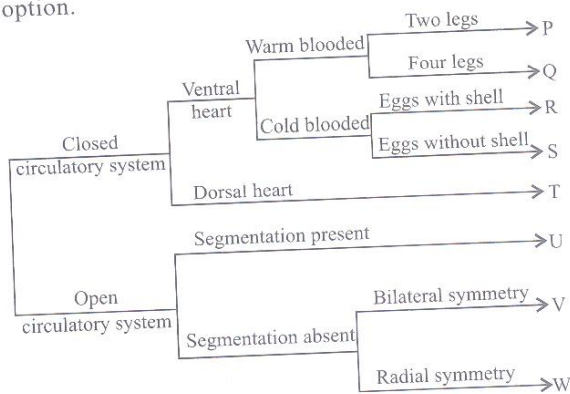
34. The nucleon number of atom X is 37. It exists as a diatomic molecule, X_2 . One molecule of X_2 contains 34 protons. How many neutrons are present in the nucleus of atom X?
 A. 17
 B. 20
 C. 21
 D. 25

35. Ritu is studying about four epithelial tissues of the human body which primarily help in the following functions :

- I. Gas exchange
 II. Gamete formation
 III. Movement of mucus
 IV. Protection of underlying parts against abrasion
 The given epithelial tissues respectively are ____.
 A. Simple cuboidal epithelium, simple ciliated epithelium, simple squamous epithelium, white fibrous tissue

- B. Simple ciliated epithelium, simple cuboidal epithelium, simple squamous epithelium, stratified squamous epithelium
- C. Simple squamous epithelium, simple cuboidal epithelium, simple ciliated epithelium, stratified squamous epithelium
- D. Stratified transitional epithelium, simple ciliated epithelium, simple squamous epithelium, white fibrous tissue

36. Refer to the given key for the identification of the animal phyla from I to VIII and select the correct option.



I. Mammalia	II. Aves
III. Arthropoda	IV. Echinodermata
V. Annelida	VI. Mollusca
VII. Reptilia	VIII. Amphibia

	P	Q	R	S	T	U	V	W
A.	II	I	VI	IV	VII	V	VIII	III
B.	I	II	VIII	VII	III	IV	VI	V
C.	I	II	VIII	VII	IV	V	III	VI
D.	II	I	VII	VIII	V	III	VI	IV

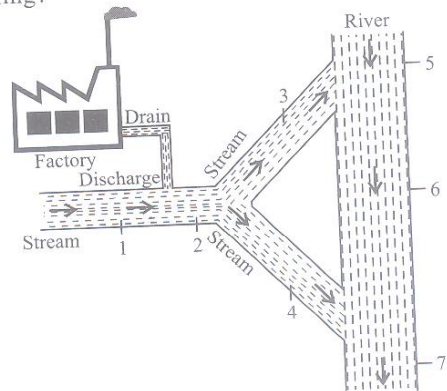
37. Following are some characteristics of the three divisions of Kingdom Plantae : Bryophyta, Thallophyta and Pteridophyta.

1. Sex organs are multicellular
2. Essentially terrestrial
3. Non vascular
4. Lack true leaves and roots
5. Embryo formed after fertilization
6. Photoautotrophs
7. Examples are *Lycopodium*, *Equisetum*, *Azolla*, *Marsilea*
8. Sporophyte is parasitic over gametophyte
9. Examples are *Ulva*, *Fucus*, *Sargassum*, *Cladophora*

Select the option which shows the correct characteristics of the respective divisions.

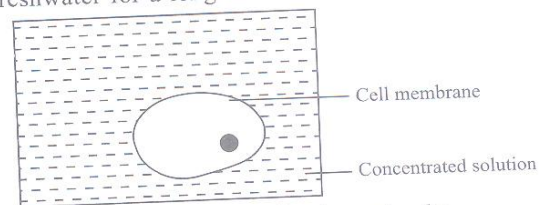
	Bryophyta	Thallophyta	Pteridophyta
A.	1, 2, 3, 4, 6, 8	3, 4, 5, 6, 9	1, 2, 5, 6, 7
B.	1, 2, 3, 4, 5, 6,	3, 4, 6, 9	1, 2, 5, 6, 7, 8
C.	1, 2, 3, 4, 5, 6, 8	3, 4, 6, 7	1, 2, 5, 6, 9
D.	1, 2, 3, 4, 5, 6, 8	3, 4, 6, 9	1, 2, 5, 6, 7

38. A group of students would like to know how the effluent from a factory might influence water quality of a river. The given diagram shows seven potential sampling locations (1 to 7) along the factory and the river. In order to draw a valid conclusion about the river water pollution caused by the factory discharge, which locations (1 to 7) shall be included for the sampling?



- A. Locations 2, 3, 4, 6
- B. Locations 1, 2, 4, 7
- C. Locations 2, 5, 6, 7
- D. Locations 1, 2, 5, 7

39. The given diagram shows a cell placed in a concentrated solution. What would happen when the cell is taken out from the concentrated solution and is placed in freshwater for a long time?



- I. The cell will recover its shape slowly.
- II. The cell will shrink first.
- III. The cell will burst eventually.
- IV. Water molecules will diffuse into the cell by osmosis.

Select the correct option.

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

40. The list given below shows some diseases caused by microorganisms/infectious agents. How many of these diseases are caused by virus?

Elephantiasis, Tetanus, Hepatitis-B, Ringworm, Kala-azar, Influenza, Mumps, Typhoid, Dengue, Sleeping sickness

- A. 3
- B. 4
- C. 6
- D. 5

41. Read the given statements.

- I. Bee wax obtained from beehive is a deposition of the excretory products of honeybee.

- II. Fish culture is sometimes done in combination with rice crop so that fish are grown in the water accumulated in the paddy field.
- III. Fish feed in different zones of the pond in order to make the most efficient use of the available food.
- IV. Sahiwal and Murrah are exotic breeds used extensively in cattle farming.
- V. Inter-cropping is growing two or more crops simultaneously on the same field in a definite pattern.

Which of the given statements are incorrect?

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

42. Weeds are the unwanted plants, which grow along with the crops and share nutrients, water and sunlight with the crops. Removal of these weeds can be done either by handpicking or with the help of chemicals. Which one of the following chemicals given below is a weedicide?

- A. 2, 4-D B. CH_4
C. BHC D. C_2H_4

43. Match Column-I with Column-II and select the correct option from the codes given below :

Column-I (National Park)	Column-II (State)
a. Bandipur National Park	I. Karnataka
b. Dachigam National Park	II. Madhya Pradesh
c. Corbett National Park	III. Uttarakhand
d. Dudhwa National Park	IV. Jammu & Kashmir
e. Gir National Park	V. Uttar Pradesh
f. Kanha National Park	VI. Assam
g. Kaziranga National Park	VII. Gujarat

	a	b	c	d	e	f	g
A.	I	IV	III	V	VII	II	VI
B.	V	I	IV	III	II	VII	VI
C.	I	IV	III	V	VII	VI	II
D.	III	II	I	VII	V	IV	VI

44.

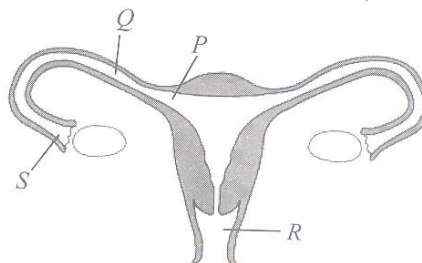


Figure X

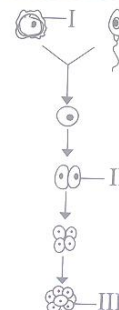


Figure Y

Figure X shows the female reproductive system and figure Y shows the development of a fertilized egg cell. In which labelled parts of the female reproductive system will the stages I, II and III occur?

	I	II	III
A.	S	P	P
B.	S	Q	P
C.	S	Q	Q
D.	S	Q	R

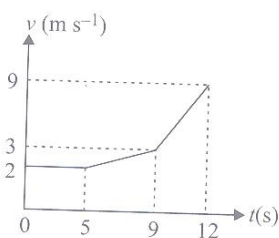
45. Which of the following statements is the drawback of the green revolution?

- A. Excessive use of chemical fertilizers, pesticides, etc. resulted in air, soil and water pollution.
B. More requirement of water by high-yielding crops resulted in the depletion of underground water resources.
C. Use of agrochemicals was an expensive measure for Indian farmers.
D. All of these

ACHIEVERS SECTION

46. The speed-time graph for the motion of a motorcycle is shown here. What is the average speed over 12 s interval?

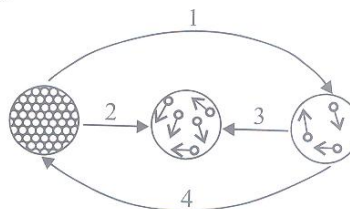
- A. 4.38 m s^{-1}
B. 5.58 m s^{-1}
C. 1.75 m s^{-1}
D. 3.17 m s^{-1}



47. When an ideal simple pendulum oscillates between the extreme points P and Q, there is continuous (i) of potential energy and kinetic energy. The potential energy depends on the choice of (ii). Force acting on the bob of the pendulum is maximum at (iii), and minimum at (iv).

	(i)	(ii)	(iii)	(iv)
A.	Dissipation	reference level	mid point	extremes
B.	Dissipation	mass	mid point	extremes
C.	Exchange	reference level	extremes	mid point
D.	Exchange	velocity	extremes	mid point

48. Given figure shows the effects of pressure and temperature on the changes among three states of matter.



Select the correct statements.

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g. Kaziranga National Park	VII. Gujarat

	a	b	c	d	e	f	g
A.	I	IV	III	V	VII	II	VI
B.	V	I	IV	III	II	VII	VI
C.	I	IV	III	V	VII	VI	II
D.	III	II	I	VII	V	IV	VI

44.

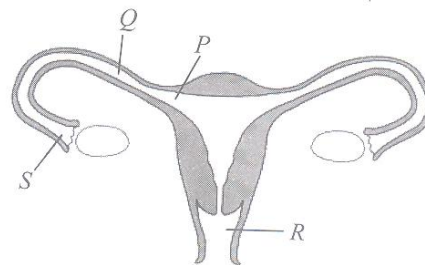


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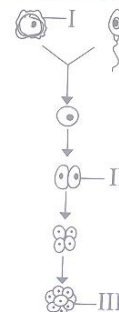


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	I	II	III
A.	S	P	P
B.	S	Q	P
C.	S	Q	Q
D.	S	Q	R

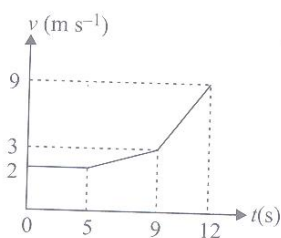
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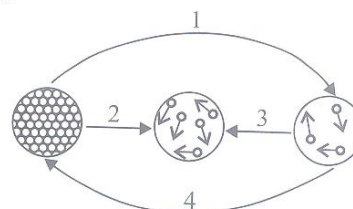
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