

## Category 2

- A cylindrical conductor of length  $l$  and uniform area of crosssection  $A$  has resistance  $R$ . Another conductor of length  $2l$  and resistance  $R$  of the same material has area of cross section  
(a)  $A/2$  (b)  $3A/2$   
(c)  $2A$  (d)  $3A$
- The resistivity does not change if  
(a) the material is changed  
(b) the temperature is changed  
(c) the shape of the resistor is changed  
(d) both material and temperature are changed
- In an electrical circuit two resistors of  $2\ \Omega$  and  $4\ \Omega$  respectively are connected in series to a  $6\ \text{V}$  battery. The heat dissipated by the  $4\ \Omega$  resistor in  $5\ \text{s}$  will be  
(a)  $5\ \text{J}$  (b)  $10\ \text{J}$   
(c)  $20\ \text{J}$  (d)  $30\ \text{J}$
- Unit of electric power may also be expressed as  
(a) volt ampere  
(b) kilowatt hour  
(c) watt second  
(d) joule second
- If the key in the arrangement (Figure 13.1) is taken out (the circuit is made open) and magnetic field lines are drawn over the horizontal plane ABCD, the lines are  
(a) concentric circles  
(b) elliptical in shape  
(c) straight lines parallel to each other  
(d) concentric circles near the point O but of elliptical shapes as we go away from it
- The physical state of water at  $100\ ^\circ\text{C}$  is:  
(a) Solid (b) Liquid  
(c) Gas (d) Plasma
- Which of the following has maximum kinetic energy?  
(a) Ice (b) Water  
(c) Steam (d) Salt solution
- Which of the following is a pure substance?  
(a) Air (b) Milk  
(c) Water (d) Soda water
- Who gave the law of conservation of mass?  
(a) Dalton (b) Lavoisier  
(c) Thomson (d) Rutherford
- The negatively charged particle in an atom is:  
(a) Proton (b) Electron  
(c) Neutron (d) Nucleus
- Assertion (A): Guard cells control the opening and closing of stomata.  
Reason (R): Stomata open when guard cells lose water.  
(A) Both A and R are true, and R explains A  
(B) Both A and R are true, but R does not explain A  
(C) A is true, but R is false  
(D) Both A and R are false
- The correct sequence in the human alimentary canal is —  
(A) Mouth  $\rightarrow$  Pharynx  $\rightarrow$  Oesophagus  $\rightarrow$  Stomach  $\rightarrow$  Small intestine  $\rightarrow$  Large intestine  
(B) Mouth  $\rightarrow$  Stomach  $\rightarrow$  Oesophagus  $\rightarrow$  Pharynx  $\rightarrow$  Intestine  
(C) Mouth  $\rightarrow$  Small intestine  $\rightarrow$  Stomach  $\rightarrow$  Large intestine  
(D) Mouth  $\rightarrow$  Pharynx  $\rightarrow$  Stomach  $\rightarrow$  Large intestine
- Match the following:  
(A) Phloem  $\rightarrow$  (i) Water transport  
(B) Xylem  $\rightarrow$  (ii) Food transport  
(C) Stomata  $\rightarrow$  (iii) Transpiration  
(D) Root hairs  $\rightarrow$  (iv) Absorption of water  
(A) a-ii, b-i, c-iii, d-iv  
(B) a-i, b-ii, c-iv, d-iii  
(C) a-iv, b-iii, c-i, d-ii  
(D) a-ii, b-iv, c-i, d-iii

14. Identify the correct statements about chromosomes:  
 (1) They are visible during cell division.  
 (2) Made of DNA and protein.  
 (3) Found only in animal cells.  
 (4) Carry hereditary information.  
 (A) 1, 2 & 4 (B) 1 & 3  
 (C) 2, 3 & 4 (D) All four
15. The smallest blood vessels are —  
 (A) Arteries (B) Veins  
 (C) Capillaries (D) Venules
16. Match the following:  
 (a) Cerebrum → (i) Balance and posture  
 (b) Cerebellum → (ii) Intelligence and thinking  
 (c) Medulla → (iii) Involuntary actions  
 (A) a–ii, b–i, c–iii  
 (B) a–iii, b–ii, c–i  
 (C) a–i, b–ii, c–iii  
 (D) a–ii, b–iii, c–i
17. Which of the following statements are correct about excretion in plants?  
 (1) Gaseous wastes diffuse out through stomata.  
 (2) Some waste materials are stored in leaves and bark.  
 (3) Plants excrete urea through roots.  
 (4) Resins and gums are waste products.  
 (A) 1, 2 & 4 (B) 1 & 3  
 (C) 2, 3 & 4 (D) Only 1 & 4
18. Assertion (A): Bryophyllum reproduces by leaf buds.  
 Reason (R): Buds on leaves grow into new plants under suitable conditions.  
 (A) Both A and R are true, and R correctly explains A  
 (B) Both A and R are true, but R does not explain A  
 (C) A is true, but R is false  
 (D) Both A and R are false
19. Match the following:  
 (a) Bile → (i) Enzyme to digest protein  
 (b) Amylase → (ii) Digests starch  
 (c) Trypsin → (iii) Breaks down fats  
 (A) a–iii, b–ii, c–i  
 (B) a–ii, b–iii, c–i  
 (C) a–i, b–ii, c–iii  
 (D) a–iii, b–i, c–ii
20. Which statements are correct about transpiration?  
 (1) It causes cooling effect in plants.  
 (2) It occurs through lenticels and stomata.  
 (3) It decreases the rate of water absorption.  
 (4) It helps in water movement.  
 (A) 1, 2 & 4 (B) 2 & 3  
 (C) 1, 3 & 4 (D) All four
21. Mitochondria are called the powerhouse of the cell because they —  
 (A) Store genetic material  
 (B) Generate ATP energy  
 (C) Help in cell division  
 (D) Secrete hormones
22. The structural and functional unit of kidney is —  
 (A) Nephron  
 (B) Glomerulus  
 (C) Tubule  
 (D) Bowman's capsule
23. Which of the following pairs is correctly matched?  
 (A) Cytokinin – Promotes dormancy  
 (B) Auxin – Cell elongation  
 (C) Gibberellin – Inhibits growth  
 (D) Ethylene – Root formation
24. Select the correct statements:  
 (1) White blood cells defend against infections.  
 (2) Platelets help in blood clotting.  
 (3) Red blood cells carry oxygen.  
 (4) Veins carry blood away from heart.  
 (A) 1, 2 & 3 (B) 2 & 4  
 (C) 1 & 3 only (D) All four
25. The major excretory product in humans is —  
 (A) Carbon dioxide (B) Urea  
 (C) Ammonia (D) Uric acid
26.  $(507)^2 - (497)^2 =$   
 (a) 10040 (b) 1004  
 (c) 10140 (d) 1014
27. A bag has 4 red balls and 2 yellow balls. (The balls are identical in all respect other than colour.) A ball is drawn from

the bag without looking into the bag.  
The probability of getting a red ball is:

- (a)  $\frac{1}{2}$  (b)  $\frac{2}{3}$   
(c)  $\frac{1}{4}$  (d)  $\frac{1}{5}$

28. How many cubic meters of earth must be dug out to construct a well of depth 28 m and diameter 3 m?

- (a)  $198 \text{ m}^3$  (b)  $128 \text{ m}^3$   
(c)  $60 \text{ m}^3$  (d)  $72 \text{ m}^3$

29. Factors of  $4a^2 + 9b^2 - 16c^2 - 12ab$  are

- (a)  $(2a - 3b - 4c)(2a + 3b + 4c)$   
(b)  $(2a + 3b - 4c)(2a + 3b + 4c)$   
(c)  $(2a - 3b - 4c)(2a - 3b + 4c)$   
(d)  $(a + b + c)(4a - 9b + 4c)$

30. Which of the following is the cube root of 0.027?

- (a) 0.003 (b) 0.03  
(c) 0.3 (d) 3

31. The area of a square is  $4x^2 + 4x + 1$ . The perimeter of the square is:

- (a)  $4(x + 1)$  (b)  $4(x - 1)$   
(c)  $2(x + 1)$  (d)  $4(2x - 1)$

32. The area of an equilateral triangle is  $24\sqrt{3}$  sq. cm. The perimeter of this triangle (in cm) is:

- (a)  $6\sqrt{6}$  (b)  $12\sqrt{6}$   
(c)  $15\sqrt{6}$  (d)  $15\sqrt{3}$

33. A man insures 90% of his property and pays  $1\frac{2}{3}\%$  premium amounting to ₹360. The total value of the property is:

- (a) ₹18,000 (b) ₹24,000  
(c) ₹30,000 (d) ₹28,000

34. If  $x = 7 - 4\sqrt{3}$ , then the value of  $(x + \frac{1}{x})$  is:

- (a)  $3\sqrt{3}$  (b)  $8\sqrt{3}$   
(c)  $14 + 8\sqrt{3}$  (d) 14

35.  $(\frac{\sqrt[3]{8}}{\sqrt{16}} \div \frac{\sqrt{100}}{\sqrt{49}} \times \sqrt[3]{125})$  is equal to :

- (a) 7 (b)  $\frac{4}{7}$   
(c)  $\frac{7}{100}$  (d)  $\frac{4}{7}$

36. A loaded truck covers 18 km in 35 minute. At the same speed, how far can it travel in 7 hours?

- (a) 196 km (b) 192 km  
(c) 216 km (d) 212 km

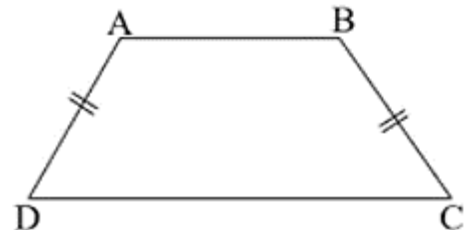
37. On a certain sum, the simple interest at the end of  $6\frac{1}{4}$  years becomes  $(\frac{3}{8})^{th}$  of the sum. The rate percent is :

- (a) 7% (b) 6%  
(c) 5% (d)  $5\frac{1}{2}\%$

38. If  $\frac{5x}{3} - 4 = \frac{2x}{5}$ , then the value of  $(2x - 7)$  is:

- (a)  $\frac{19}{13}$  (b)  $-\frac{13}{19}$   
(c) 0 (d)  $\frac{13}{19}$

39. ABCD is an isosceles trapezium, i.e. AD = BC. Then :



- (a)  $AD = CD$  (b)  $\angle A = \angle B$   
(c)  $\angle A = \angle D$  (d)  $\angle A = \angle C$

40. What is the ratio of the area of a square to the area of another square made on the diagonal of the first square?

- (a)  $1 : \sqrt{2}$  (b)  $1 : 2$   
(c)  $2 : 1$  (d)  $\sqrt{2} : 1$

41. Select the combination of numbers so that letters arranged accordingly will form a meaningful word

R A C E T  
1 2 3 4 5

- (A) 1, 2, 3, 4, 5 (B) 3, 2, 1, 4, 5  
(C) 5, 2, 3, 4, 1 (D) 5, 1, 2, 3, 4

42. The letters of the word NUMKIPP are in disorder. If they are arranged in proper order, the name of a vegetable is formed. What is the last letter of the word so formed?

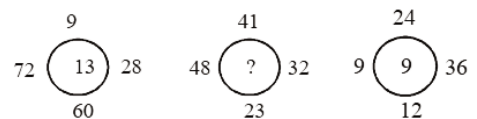
- (A) K (B) M  
(C) N (D) P

43. **DIRECTIONS:** Find which one word cannot be made from the letters of the given word  
UNCONSCIOUS  
(A) SON (B) COIN  
(C) SUN (D) NOSE
44. If HELMET is written as IFMNFU. Then how will CHOCOLATE be written as?  
(A) DIPPMPBUF  
(B) EIPPMPBUF  
(C) DIPPMPBUF  
(D) DIPPMPBUF
45. How many 5s are there in the following sequence which are immediately followed by 3 but not immediately preceded by 7?  
8 9 5 3 2 5 3 8 5 5 6 8 7 3 3 5 7 7 5 3 6 5  
3 3 5 7 3 8  
(A) One (B) Two  
(C) Three (D) Four
46. Ramakant walks northwards. After a while, he turns to his right and a little further to his left. Finally, after walking a distance of one kilometre, he turns to his left again. In which direction is he moving now?  
(A) North (B) South  
(C) East (D) West
47. P, Q, R, S, T, U, V and W are sitting around a round table in the same order, for group discussion at equal distance. Their positions are clockwise. If V sits in the north, then what will be the position of S?  
(A) East (B) South-east  
(C) South (D) South-west
48. One morning after sunrise, Gopal was facing a pole. The shadow of the pole fell exactly to his right. Which direction was he facing?  
(A) South  
(B) East  
(C) West  
(D) Data inadequate
49. One morning after sunrise, Reeta and Kavita were talking to each other face to face at Tilak Square. If Kavita's shadow

was exactly to the right to Reeta, which direction Kavita was facing?  
(A) North  
(B) South  
(C) East  
(D) Data inadequate

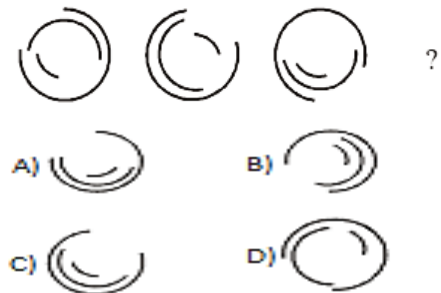
50. At what time between 9 and 10 will the hands of a watch be together?  
(A) 45 minutes past 9  
(B) 50 minutes past 9  
(C)  $49\frac{1}{11}$  minutes past 9  
(D)  $48\frac{2}{11}$
51. An accurate clock shows 8 O'clock in the morning. Through how many degrees will the hour hand rotate when the clock shows 2 O'clock in the afternoon?  
(A)  $144^\circ$  (B)  $150^\circ$   
(C)  $168^\circ$  (D)  $180^\circ$

52.

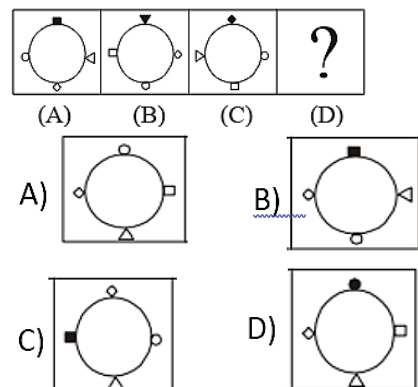


- (A) 12 (B) 15  
(C) 17 (D) 18

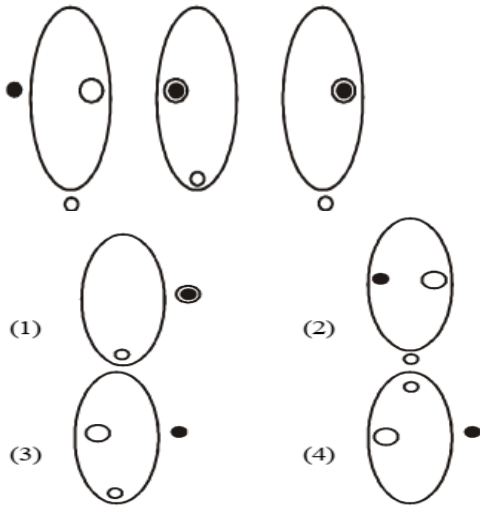
53. What comes next in the sequence?



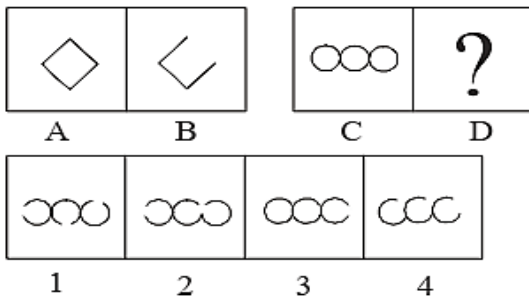
54.



55. What comes next in the sequence?

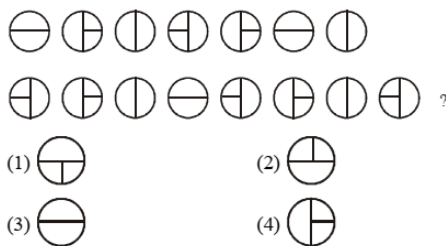


56. Figures A and B are related in a particular manner. Establish the same relationship between figures C and D by choosing a figure from amongst the alternatives which would replace the question mark.



- A) 1                      B) 2  
C) 3                      D) 4

57. Which circle should replace the question mark?



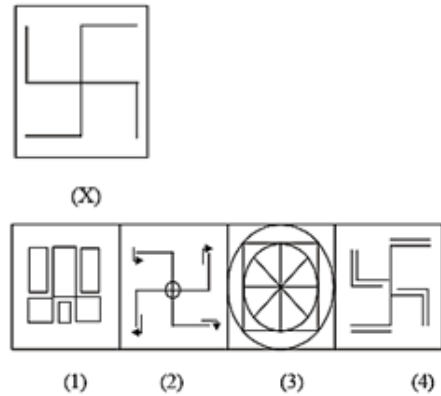
- A) 1                      B) 2  
C) 3                      D) 4

58. NEWS | ?

- (1) NEWS                (2) WEN  
(3) WEN                (4) NEWS

59. Looking into a mirror, the clock shows 9 : 30 as the time. The actual time is  
(A) 2 : 30                      (B) 3 : 30  
(C) 4 : 30                      (D) 6 : 30

60.



**Passage 1: The Mystery of the Missing Water**

Every summer, the town of Noorabad faced a strange problem. The main lake, which supplied water to most houses, would lose nearly one-third of its water within just a few weeks. People believed it was because of the heat, but this year a group of students from Class 7 decided to investigate.

They began by measuring the water level every morning for ten days. They also recorded the temperature, rainfall, and how many hours the water pump was use(D) Soon they noticed something unusual: the greatest drop in water level happened on days when the water pump ran for longer hours, even when the temperature was low.

Curious, they interviewed the staff at the nearby farms and learned that many farmers secretly used the lake water at night to irrigate their fields, even though this was against the town rules. The students presented their findings to the town council, suggesting installation of a simple meter to track nighttime usage. The council appreciated the students' effort and immediately approved the ide(A)

Within a month of monitoring, the lake's water level stopped falling

rapidly. The students' small investigation had helped save an entire town from a future water crisis.

#### Questions (MCQ)

61. Why did the students start investigating the lake?  
(A) They wanted to measure rainfall  
(B) They noticed the lake was losing water every summer  
(C) Their teacher gave them a project  
(D) The farmers asked them to
62. What unusual pattern did the students observe?  
(A) Water level dropped only during rainfall  
(B) Temperature caused the highest loss of water  
(C) Water level dropped most when the pump ran longer  
(D) Water level never changed
63. What did the students discover during interviews?  
(A) Farmers were planting new crops  
(B) Farmers were using lake water illegally at night  
(C) The pump was broken  
(D) The lake had a hidden leak
64. What solution did the students suggest?  
(A) Closing the lake  
(B) Building a new pump  
(C) Installing a meter to monitor night usage  
(D) Allowing farmers free access
65. What happened after the new system was installed?  
(A) The lake dried completely  
(B) The water level became stable  
(C) Farmers refused to cooperate  
(D) The pump stopped working

#### Passage 2: The Clock Tower Rescue

The old clock tower in the center of Shadipur had stopped working for almost six months. The people of the town used it to check the time while going to school, work, or the market. Without it, everyone complained about delays and confusion.

One day, Anaya, a curious Class 8 student, asked the town mechanic if she could watch him repair the tower. When they climbed up, they found that the gears were rusty and the main pendulum was stuck. But there was a bigger surprise waiting: a family of pigeons had built a nest inside the machinery, making it impossible for the clock to move.

Instead of removing the pigeons forcefully, Anaya suggested placing a wooden platform beside the clock mechanism where the birds could safely shift their nest. Together with the mechanic, she slowly transferred the pigeons and cleaned the gears.

After three hours of careful work, the clock tower began ticking again. The townspeople gathered to cheer, and the council praised Anaya for her thoughtful and humane solution.

#### Questions (MCQ)

66. Why was the clock tower causing problems in Shadipur?  
(A) It was too tall  
(B) It had stopped working for months  
(C) It made too much noise  
(D) It blocked traffic
67. What was found inside the clock mechanism?  
(A) A broken spring  
(B) A thief hiding  
(C) A pigeons' nest  
(D) A bag of tools
68. What made the gears stop working?  
(A) The pigeons' nest and rust  
(B) A lightning strike  
(C) Too much dust from the market  
(D) Someone turned it off
69. What solution did Anaya suggest?  
(A) Destroy the pigeons' nest immediately  
(B) Build a new tower  
(C) Shift the pigeons safely to a side platform  
(D) Close the tower permanently

70. How did the town react after the clock was fixed?  
(A) They ignored it  
(B) They blamed the mechanic  
(C) They celebrated and praised Anaya  
(D) They complained it was too slow
71. Who was the first muezzin (caller to prayer) in Islam?  
(A) Abu Bakr (RA)  
(B) Bilal ibn Rabah (RA)  
(C) Umar ibn Al-Khattab (RA)  
(D) Salman Al-Farsi (RA)
72. Which Mughal emperor built the Buland Darwaza at Fatehpur Sikri?  
(A) Akbar (B) Shah Jahan  
(C) Jahangir (D) Babur
73. What is the capital city of the newly admitted BRICS member, Saudi Arabia (2024 expansion)?  
(A) Medina (B) Riyadh  
(C) Jeddah (D) Dammam
74. In the Seerah, during which battle was the trench (Khandaq) dug around Madinah?  
(A) Battle of Badr  
(B) Battle of Uhud  
(C) Battle of Khandaq  
(D) Battle of Tabuk
75. Which architectural feature is most closely associated with Indo-Islamic architecture?  
(A) Doric columns  
(B) Flying buttresses  
(C) Pointed arches  
(D) Wooden pagodas
76. Which country recently hosted the 2024 UN Climate Ambition Summit?  
(A) Japan (B) Brazil  
(C) United States (D) UAE
77. What is the name of the treaty in which the Quraysh and Muslims agreed to a 10-year truce?  
(A) Treaty of Aqabah  
(B) Treaty of Taif  
(C) Treaty of Hudaibiyah  
(D) Treaty of Khaybar

78. Who wrote the famous work Ain-i-Akbari, describing Mughal administration and culture?  
(A) Ibn Battuta  
(B) Al-Biruni  
(C) Abul Fazl  
(D) Amir Khusrau
79. Which Indian athlete won a gold medal in javelin at the 2023 World Athletics Championships?  
(A) Annu Rani  
(B) Neeraj Chopra  
(C) Milka Singh  
(D) Hima Das
80. What is the Arabic term for the oneness of Allah, the core belief in Islam?  
(A) Salah (B) Taqwa  
(C) Tawheed (D) Sabr