



SCIENCE STREAM

PHYSICS

1. A concave mirror produces 10 cm long image of an object of height of 2 cm on a screen. What is the magnification produced?
A. -5
B. +0.5
C. +5
D. -0.2
E. +0.2
2. In an electrical circuit, two resistors of $2\ \Omega$ and $4\ \Omega$ respectively are connected in series to a 6 V battery. The heat dissipated by the $4\ \Omega$ resistor in 5 s will be:
A. 5J
B. 10J
C. 20J
D. 30J
E. 40J
3. You are given three media P, Q and R of refractive index 1.33, 1.65 and 1.46. The medium in which the light travels fastest:
A. P
B. Q
C. R
D. Equal in all three media
E. Insufficient data
4. The relation between potential difference (V) and current (I) is:
A. $V \propto I^2$
B. $V \propto 1/I$
C. $V^2 \propto I$
D. $V \propto I$
E. $V = I$
5. In torches, search lights and headlights of vehicles, the bulb is placed:
A. At the pole of the reflector
B. Between the pole and the focus of the reflector
C. At the focus of the reflector
D. Between the focus and centre of curvature of the reflector
E. At the centre of curvature of the reflector
6. An electric kettle consumes 1 kW of electric power when operated at 220 V. A fuse wire of what rating must be used for it?
A. 1A
B. 2A
C. 3A
D. 4A
E. 5A
7. When white light passes through a prism, maximum deviation is for:
A. Red colour
B. Yellow colour
C. Blue colour
D. Violet colour
E. Green colour
8. The heating element of an electric iron is made up of:
A. copper
B. nichrome
C. aluminium
D. silver
E. iron

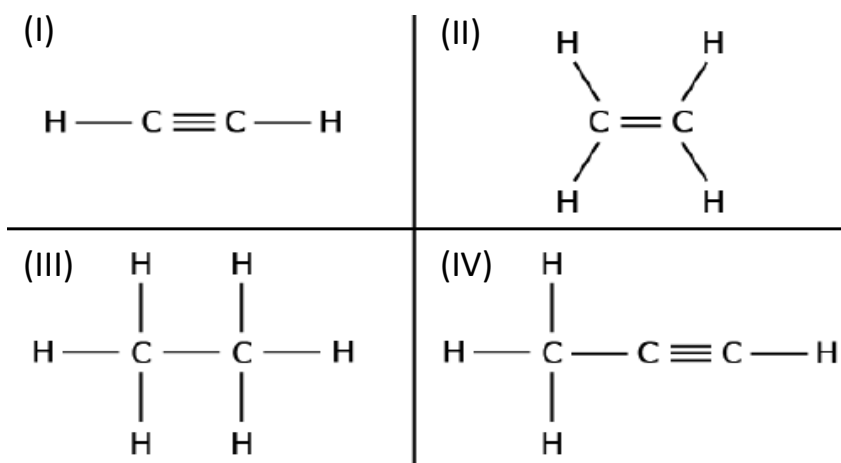
9. A concave mirror gives real, inverted, and same size image, if the object is placed:
- At F
 - At infinity
 - At C
 - Beyond C
 - Between F and C
10. If two electric bulbs one of 200 V–40 W and other of 200 V–100 W are connected in a domestic circuit, then
- They have equal resistance
 - The resistance of 100 W bulb is more than 40 W bulb
 - They have equal current passing through them
 - The resistance of 40 W bulb is more than 100 W bulb
 - None of the above
11. Power of the lens is -4D. Its focal length is:
- 4m
 - 4m
 - 0.25m
 - 25m
 - 25m
12. The magnetic field lines produced by a bar magnet:
- Originate from the South Pole and end at its north pole
 - Originate from the North Pole and end at its east pole
 - Originate from the North Pole and end at its south pole
 - Originate from the South Pole and end at its west pole
 - All of the above.
13. When the object is placed between F and 2F of a convex lens, the image formed is:
- At F
 - At 2F
 - Beyond 2F
 - Between O and F
 - Between 2F and F
14. A current carrying conductor placed in magnetic field experiences a force. The displacement of the conductor in magnetic field can be increased by:
- Decreasing the current in the conductor
 - Decreasing the magnetic field
 - Increasing the magnetic field
 - Increasing the current in the conductor
 - None of the above
15. A current carrying conductor placed in magnetic field experiences a force. The amount of force experienced by a current carrying conductor in magnetic field can be increased by:
- Decreasing the magnetic field.
 - Increasing the current in the conductor.
 - Increasing the magnetic field.
 - Decreasing the current in the conductor.
 - Both option A and B

CHEMISTRY

16. On placing a copper coin in a test tube containing green ferrous sulphate solution, it will be observed that the ferrous sulphate solution:
- A. Turns colourless and a grey substance is deposited on the copper coin
 - B. Turns colourless and reddish-brown substance is deposited on the copper coin
 - C. Turns blue, and a grey substance is deposited on the copper coin
 - D. Remains green with no change in the copper coin
 - E. Turns green and a reddish-brown substance is deposited on copper coin
17. The pair which will show displacement reaction is/are
- i) NaCl solution and copper metal
 - ii) AgNO₃ solution and copper metal
 - iii) Al₂(SO₄)₃ solution and magnesium metal
 - iv) ZnSO₄ solution and Iron metal
 - v) FeSO₄ solution and copper metal
- A. i only
 - B. ii and iii
 - C. i and ii
 - D. ii only
 - E. iii and iv
18. From the following, which one is an example of a chemical reaction?
- A. Grapes get fermented
 - B. Breakdown of food
 - C. Formation of curd
 - D. Rusting of iron
 - E. All of the these
19. What happens when lead nitrate reacts with potassium iodide?
- A. They will not react
 - B. A large amount of hydrogen will be released
 - C. Yellow precipitate of lead iodide and potassium nitrate will be produced
 - D. Evolution of gas will occur
 - E. Yellow precipitate of lead iodide and nitrogen dioxide gas will be evolved
20. What happens when a solution of an acid is mixed with a solution of a base in a test tube?
- (i) The temperature of the solution decreases
 - (ii) The temperature of the solution increases
 - (iii) The temperature of the solution remains the same
 - (iv) Salt formation takes place
 - (v) No reaction takes place
- A. (ii) only
 - B. (i) and (iv)
 - C. (v) only
 - D. (i) and (iii)
 - E. (ii) and (iv)

21. In terms of acidic strength, which one of the following is in the correct increasing order?
- | | |
|--|--|
| A. Water < Acetic acid < Hydrochloric acid | D. Hydrochloric acid < Water < Acetic acid |
| B. Water < Hydrochloric acid < Acetic acid | E. Acetic acid < Hydrochloric acid < Water |
| C. Acetic acid < Water < Hydrochloric acid | |
22. Identify the strong base from the given bases
- | | |
|-----------------------|------------------------|
| A. Calcium hydroxide | D. Magnesium hydroxide |
| B. Ammonium hydroxide | E. Copper hydroxide |
| C. Ferric Hydroxide | |
23. Aqua regia is a freshly prepared mixture of concentrated HNO_3 and concentrated HCl in the ratio of:
- | | |
|----------------------|----------------------|
| A. 1:3, respectively | D. 3:2, respectively |
| B. 2:3, respectively | E. 1:1, respectively |
| C. 3:1, respectively | |
24. Which of the following is commonly used as an antacid?
- | | |
|------------------------|----------------------|
| A. Magnesium hydroxide | D. Calcium hydroxide |
| B. Potassium hydroxide | E. Sodium carbonate |
| C. Magnesium carbonate | |
25. The correct chemical formula of ferric sulphate is
- | | |
|---------------------------------|---------------------------------|
| A. FeSO_4 | D. $\text{Fe}(\text{SO}_4)_2$ |
| B. Fe_2SO_4 | E. $\text{Fe}_2(\text{SO}_4)_3$ |
| C. $\text{Fe}_3(\text{SO}_4)_2$ | |
26. What happens when a pellet of sodium is dropped in water?
- | | |
|--|--|
| A. It catches fire and forms oxide | D. It absorbs heat and forms hydroxide |
| B. It absorbs heat and forms oxide | E. It dissolves in water and forms hydroxide |
| C. It catches fire and forms hydroxide | |
27. The highly reactive metals like Sodium, Potassium, Magnesium, etc. are extracted by the
- | | |
|--|-----------------------------------|
| A. electrolysis of their molten chloride | C. electrolysis molten carbonates |
| B. electrolysis of their molten oxides | D. reduction by aluminium |
| | E. reduction by carbon |

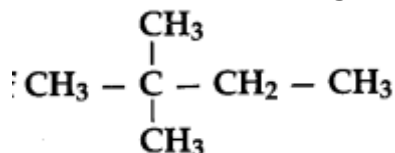
28. The image represents the structure of a few hydrocarbon compounds.



Which of these compounds can be classified as alkynes?

- | | |
|----------------------|------------------------|
| A. Only (I) | D. Both (II) and (III) |
| B. Only (II) | E. I, II and IV |
| C. Both (I) and (IV) | |

29. The IUPAC name of the following compound is:



- | | |
|-----------------------------|-----------------------|
| A. 2-ethyl-2-methyl propane | D. 2, 2-methyl butane |
| B. 2, 2-dimethyl butane | E. 2-dimethyl butane |
| C. 1,1,1-trimethyl propane | |

30. Ethanol reacts with sodium and forms two products. These are:

- | | |
|----------------------------------|-------------------------------|
| A. Sodium ethanoate and hydrogen | D. Sodium ethoxide and oxygen |
| B. Sodium ethanoate and oxygen | E. Sodium ethoxide and water |
| C. Sodium ethoxide and hydrogen | |

ENGLISH

31. Select the sentence with the appropriate use of adverb of manner.

- | | |
|-------------------------------|-------------------------------------|
| A. He done his work regularly | D. He has done his work on my table |
| B. He has just done his work | E. He has been doing his work |
| C. He does his work carefully | |

32. Select the correct active form of the given sentence-

The clothes will be delivered by the shop on Monday.

- | | |
|--|--|
| A. The shop will be delivering the clothes on Monday. | D. The shop would deliver the clothes on Monday. |
| B. The shop will deliver the clothes on Monday | E. The delivery of the cloth will be done. |
| C. The shop would be delivering the clothes on Monday. | |

33. Select the most appropriate meaning of the underlined idiom in the given sentence-
She felt like a fish out of water at her new job.

- | | |
|-------------------------------|----------------------|
| A. Angry and hurt | D. Happy and free |
| B. Comfortable and relaxed | E. None of the above |
| C. Uncomfortable and restless | |

34. Select the most appropriate one word substitution for the given words.

A government by the nobles.

- | | |
|--------------|----------------|
| A. Monarchy | D. Aristocracy |
| B. Democracy | E. Anarchy |
| C. Oligarchy | |

35. Select the correct indirect form of the given sentence -

He said to Emma, "I celebrated my success two days ago."

- | | |
|--|--|
| A. He told Emma that he celebrated his success two days ago. | D. He had told Emma that he has celebrated his success two days ago. |
| B. He told Emma that he celebrated my success two days before. | E. He told Emma that he had celebrated his success two days before. |
| C. He told Emma that I celebrated my success two days ago. | |

36. Choose the plural form BASIS

- | | |
|------------|-----------|
| A. Bassis | D. Basuim |
| B. Bases | E. Bazzis |
| C. Basises | |

37. Choose the correct adjective form - LAUDATION

- | | |
|-------------|-------------|
| A. Laud | D. Laudably |
| B. Laudable | E. Laudator |
| C. Lauding | |

38. 'One who possesses many talents', one word substitute for the given word is :

- | | |
|----------------|--------------|
| A. Exceptional | D. Nubile |
| B. Active | E. Versatile |
| C. Wisdom | |

39. What is this an example of?

The trees laughed in the wind

- | | |
|--------------------|-----------|
| A. Oxymoron | D. Simile |
| B. Personification | E. Pun |
| C. Metaphor | |

40. Find the correctly spelt word -

- | | |
|------------------|------------------|
| A. Eflorescence | D. Efflorascence |
| B. Eflorensence | E. Efluranscence |
| C. Efflorescence | |

41. None of two girls/ who were present/ appeared to be inclined/ to listen to some advice.

- | | |
|----------------------|---------------------|
| A. None of two girls | B. Who were present |
|----------------------|---------------------|

- C. Appeared to be inclined
D. To listen to some advice
- E. No error
42. A person who makes and sells ladies' hats.
A. Draper
B. Milliner
C. Tinker
D. Farrier
E. All of the above
43. Choose the passive voice of given the sentence - 'He will object to my proposal.'
A. My proposal will be objected to by him.
B. His objection will be to my proposal.
C. There will be an objection to my proposal by him.
D. The objection to my proposal will come from him.
E. The proposal will not be objected by him.
44. Neither money nor power _____ needed to get selected for the Olympics.
A. are
B. were
C. is
D. was
E. has
45. Given below are four sentences in jumbled order. Pick the option that gives their correct order.
A. Although Sonu had many more that he wanted to ask, he realised that mummy was tired and became silent.
B. She answered a few and then stopped.
C. When mummy returned from work, she took Sonu for a walk.
D. But she was too tired to answer all his questions.
A. CABD
B. BDAC
C. DACB
D. CDBA
E. BADC

MATHEMATICS

46. If $\sin^2 A = \cos^2 A$, then value of $\cot^6 A - \cot^2 A$?
A) 1
B) 2
C) 0
D) -1
E) -2
47. If $\cot A + \operatorname{cosec} A = 3$ and A is an acute angle, then the value of $\cos A$ is
A) 1
B) $\frac{4}{5}$
C) $\frac{3}{5}$
D) 0
E) $\frac{\sqrt{3}}{2}$
48. The letters of the word SOCIETY are placed at random in a row. The probability of getting a vowel is
A) $\frac{1}{7}$
B) $\frac{1}{5}$

C) $\frac{3}{5}$
D) $\frac{3}{7}$

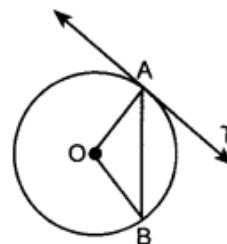
E) $\frac{5}{7}$

49. In figure, O is the centre of a circle, AB is a chord and AT is the tangent at A.

If $\angle AOB = 100^\circ$, then $\angle BAT$ is equal to

- A) 100°
B) 50°
C) 90°

- D) 40°
E) 100°



50. If the area of a circle is numerically equal to twice its circumference, then the diameter of the circle is

- A) 4 units
B) 1 unit
C) 2 units

- D) 8 units
E) 3 units

51. Mean of n numbers $x_1, x_2, x_3, \dots$ is m . If x_n is replaced by x , then the new mean is

- A) $m - x_n + x$
B) $mn + x - x_n$
C) $\frac{nm + x - x_n}{n}$

- D) $\frac{m + x - x_n}{n}$
E) $\frac{nm - x + x_n}{n}$

52. The volumes of two spheres are in the ratio $125:64$, ratio of their surface areas is

- A) $9:16$
B) $25:16$
C) $16:25$

- D) $16:9$
E) $1:1$

53. If $x \cdot \tan 45^\circ \cdot \cos 60^\circ = \sin^2 60^\circ$, then $x =$

- A) 1
B) $\frac{3}{2}$
C) $\frac{2}{3}$

- D) 3
E) 2

54. If pair of equations $ax + 2y = 7$ and $3x + by = 16$ represent parallel lines, then $ab =$

- A) 6
B) 3
C) 1

- D) 32
E) $\frac{3}{2}$

55. The equation $5x^2 + (9+4k)x + 2k^2 = 0$ and $5x + 9 = 0$ are satisfied by same value of x . Find the values of k .

- A) 0, $\frac{5}{18}$
B) 0, $-\frac{13}{5}$
C) 0, $\frac{36}{5}$

- D) 0, $\frac{13}{5}$
E) 0, $\frac{18}{5}$

56. Three farmers have 490 kg, 588 kg and 882 kg of wheat respectively. Find the maximum capacity of a bag so that the wheat can be packed in exact number of bags.

- A) 98kg
B) 290kg

- C) 78kg
D) 250kg

E) 300kg

57. If α, β are zeroes of $x^2 - (p+6)x + 2(2p-1)$ and $\alpha + \beta = \frac{1}{2} \alpha \beta$, find p

A) 1

D) -7

B) 0

E) -1

C) 7

58. It is given that $\triangle ABC \sim \triangle DFE$, $\angle A = 30^\circ$, $\angle C = 50^\circ$, $AB = 5$ cm, $AC = 8$ cm and $DF = 7.5$ cm. Then, which of the following is true:

A) congruent but not similar

D) congruent as well as similar

B) similar but not congruent

E) None of these

C) neither congruent nor similar

59. Two numbers are in the ratio 5: 6. If 8 is subtracted from each of the numbers, the ratio becomes 4:5. Then the numbers are

A) 40, 42

D) 44, 50

B) 42, 48

E) 32, 45

C) 40, 48

60. Two vertices of a triangle are $(3, -5)$ and $(-7, 4)$. If its centroid is $(2, -1)$, then the third vertex is

A) $(10, 2)$

D) $(-10, -2)$

B) $(-10, 2)$

E) $(-10, 0)$

C) $(10, -2)$