

Paper Code: 10F-2611-SP-A

SAMPLE PAPER

Class – X

Time: 2 Hour

M. Marks: 300

General Instructions:

1. Answers have to be marked on the OMR sheet.
2. The question paper consists of 75 multiple choice questions (single correct option) divided into five sections.
Section – A contains 15 questions (Q1 to Q15) of Physics.
Section – B contains 15 questions (Q16 to Q30) of Chemistry.
Section – C contains 15 questions (Q31 to Q45) of Mathematics.
Section – D contains 15 questions (Q46 to Q60) of Mental Ability.
Section – E contains 15 questions (Q61 to Q75) of Biology.
3. Each question carries +4 marks for correct answer and –1 mark for wrong answer.
4. The Question Paper contains blank spaces for your rough work. No additional sheets will be provided for rough work.
5. Blank papers, clip boards, log tables, slide rule, calculator, cellular phones, pagers and electronic devices, in any form, are not allowed.
6. Write your Name, Father Name, Class, MSAT Roll No. and Date in the space provided at the bottom of this sheet.

NAME: _____

FATHER NAME: _____

CLASS: _____

MSAT ROLL NO: _____

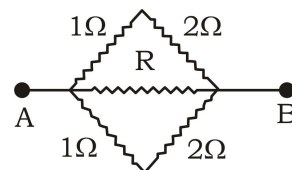
DATE: _____

PHYSICS

1. Choose the correct statement related to the image formed by a plane mirror.
 - (A) A plane mirror always form a virtual image.
 - (B) The image formed by a plane mirror may be magnified or diminished
 - (C) The image formed by a plane mirror is always unmagnified but inverted.
 - (D) The image formed by a plane mirror is always unmagnified and erect.
2. An object is placed at the centre of curvature of a concave mirror. The distance between its image and the pole is
 - (A) Equal
 - (B) Between f and $2f$
 - (C) Equal to $2f$
 - (D) Greater than $2f$
3. A converging mirror forms a virtual, erect and magnified image of an object placed
 - (A) At the pole
 - (B) At the focus
 - (C) Between the center of curvature and the focus
 - (D) Between the pole and the focus.
4. A well cut diamond appears bright because
 - (A) Its emits light
 - (B) It is radioactive
 - (C) of total internal reflection
 - (D) of dispersion
5. The light reflected by a plane mirror may form a real image,
 - (A) If the rays incident on the mirror are converging
 - (B) If the rays incident on the mirror are diverging
 - (C) If the object is placed very close to the mirror
 - (D) Under no circumstances
6. A rectangular block of glass ($R.I=3/2$) is kept in water ($R.I=4/3$). The critical angle for total internal reflection between glass and water is
 - (A) $\sin^{-1}(2/3)$
 - (B) $\sin^{-1}(3/4)$
 - (C) $\sin^{-1}(8/9)$
 - (D) $\sin^{-1}(1/2)$
7. Blue colour of sky is due to.
 - (A) dispersion of light
 - (B) scattering of light
 - (C) refraction of light
 - (D) reflection of light
8. Presbyopia is corrected by:
 - (A) Cylindrical lens
 - (B) Concave lens
 - (C) Bifocal lens
 - (D) Convex lens

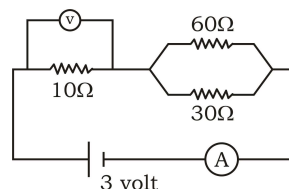
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9. Convex lens of suitable focal length can correct –
 (A) short sightedness
 (B) long sightedness
 (C) presbyopia
 (D) astigmatism
10. How many electrons in 1 C?
 (A) 6.25×10^{18} (B) 6.25×10^{12}
 (C) 6.25×10^{11} (D) 6.25
11. The space around a charge, called its:
 (A) Potential
 (B) Electric Field
 (C) Intensity
 (D) Potential difference
12. The condition for an electric charge to flow from one point to other is that the two points must have electric:
 (A) Circuit (closed)
 (B) Conducting wires
 (C) Potential difference
 (D) None
13. The equivalent resistance between point A and B in the figure is 1Ω . What is the value of unknown resistance R:



- (A) 1Ω (B) 3Ω
 (C) 6Ω (D) 9Ω

14. In how many parts (equal) a wire of 100Ω be cut so that a resistance of 1Ω is obtained by connecting them in parallel?
 (A) 10 (B) 5
 (C) 100 (D) 50
15. In the circuit shown, reading of the ammeter and the voltmeter are respectively:



- (A) 0.1 amp., 3 volt
 (B) 0.1 amp., 1 volt
 (C) 0.3 amp., 3 volt
 (D) 0.3 amp., 1 volt

CHEMISTRY

16. Identify the type of reaction taking place in
 $\text{Fe} + \text{CuSO}_4 \rightarrow \text{Cu} + \text{FeSO}_4$
 (A) Redox reaction
 (B) Displacement reaction
 (C) Neutralization reaction
 (D) Both (A) and (B)
17. On addition of which metal the blue coloured copper sulphate solution turns into colourless solution
 (A) Ag (B) Hg (C) Zn (D) Au
18. Which ionic equation corresponds to a 'redox reaction' ?
 (A) $\text{Zn(s)} + \text{Cu}^{2+}(\text{aq}) \rightarrow \text{Zn}^{2+}(\text{aq}) + \text{Cu(s)}$
 (B) $\text{MgO(s)} + 2\text{H}^+(\text{aq}) \rightarrow \text{Mg}^{2+}(\text{aq}) + \text{H}_2\text{O(l)}$
 (C) $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl(s)}$
 (D) $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O(l)}$
19. Find the (integer) stoichiometry coefficients for the correctly balanced version of the following reaction:
 $\text{Cr}_2\text{O}_7^{2-}(\text{aq}) + \text{H}^+(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{Cr}^{3+}(\text{aq}) + \text{H}_2\text{O(l)} + \text{I}_3^-(\text{aq})$
 (A) 1, 14, 1, 2, 1, 7
 (B) 1, 14, 1, 1, 7
 (C) 2, 1, 7, 1, 1, 5
 (D) 1, 14, 9, 2, 7, 3
20. The oxidation numbers of C in CH_4 , CH_3Cl , CH_2Cl_2 , CHCl_3 and CCl_4 are respectively
 (A) +4, +2, 0, -2, -4
 (B) +2, +4, 0, -4, -2
 (C) -4, -2, 0, +2, +4
 (D) -2, -4, 0, +4, +2
21. Common name of H_2SO_4 is
 (A) Oil of vitriol
 (B) Muriatic acid
 (C) Blue vitriol
 (D) Green vitriol
22. The chemical name of marble is –
 (A) calcium carbonate
 (B) magnesium carbonate
 (C) calcium chloride
 (D) calcium sulphate
23. A solution has pH 9. On dilution the pH value
 (A) decreases (B) increases
 (C) remain same (D) None of these
24. 10 mL of 0.1 N HCl is added to 990 mL solution of NaCl. The pH of the resulting solution is
 (A) zero (B) 3
 (C) 7 (D) 10
25. Which of the following salts when dissolved in water would give acidic solutions (s)?
 (A) Na_2SO_4
 (B) $(\text{NH}_4)_2\text{SO}_4$
 (C) CH_3COONa
 (D) KCl

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26. Which of the following is not an aluminium ore?
 (A) Cryolite (B) Feldspar
 (C) Bauxite (D) Azurite
27. Mond process is used to refine
 (A) Zinc (B) Mercury
 (C) Tin (D) Nickel
28. Solder is an alloy of
 (A) Pb and Sn (B) Cu and Zn
 (C) Cu and Sn (D) Zn and Sn
29. Two elements M and X have electronic configurations 2, 8, 3 and 2, 8, 6 respectively identify the correct formula of the compound formed
 (A) MX_2 (B) M_2X
 (C) M_2X_3 (D) M_3X_2
30. In CaF_2 , the number of electron(s) transferred from calcium to fluoride atoms are
 (A) 1 (B) 2
 (C) 3 (D) 4

MATHEMATICS

31. HCF of 135 and 1575 is
 (A) 45 (B) 5
 (C) 3 (D) 1
32. If the graph of a polynomial intersects the x-axis in 3 points, then its degree cannot be
 (A) 2 (B) 3
 (C) 4 (D) 5

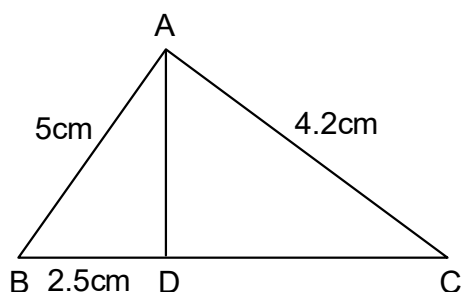
33. The number of distinct zeros of polynomial $x^2 - 4x + 4$ is/are
 (A) 0 (B) 1
 (C) 2 (D) 3
34. The equations $3x + 4y = 6$ and $\frac{3}{2}x + 2y = 4$ have
 (A) unique solution
 (B) no solution
 (C) infinitely many solutions
 (D) two solutions
35. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots then $k =$
 (A) $\frac{7}{4}$ (B) $-\frac{7}{4}$
 (C) $\frac{4}{7}$ (D) $-\frac{4}{7}$
36. If α, β are roots of $x^2 - 7x + 12 = 0$ then the equation whose roots are $3\alpha, 3\beta$ is
 (A) $(3x)^2 - 7(3x) + 12 = 0$
 (B) $\left(\frac{x}{3}\right)^2 - 7\left(\frac{x}{3}\right) + 12 = 0$
 (C) $(x - 3)^2 - 7(x - 3) + 12 = 0$
 (D) $(x + 3)^2 - 7(x + 3) + 12 = 0$
37. If 9th term from the end of an A.P. is 12th term from the beginning, then the number of terms is
 (A) 21 (B) 20
 (C) 19 (D) 22

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38. There is an A.P. consisting of 20 terms. The general term is given by $20n + 5$, then its common difference is

(A) 5 (B) 25
(C) 20 (D) 15

39. In the given figure, $\angle BAD = \angle CAD$, then DC is



(A) 2.1 cm (B) 4.2 cm
(C) 1.05 cm (D) 2 cm

40. The perimeters of two similar triangles ABC and PQR are respectively 27 cm and 15 cm. If $PQ = 10$ cm, then AB

(A) 18 cm (B) 20 cm
(C) 11 cm (D) 5 cm

41. If the coordinates of opposite vertices of a square are (1, 3) and (6, 0), then the length of side of square is

(A) $\sqrt{34}$ (B) $\sqrt{17}$
(C) 17 (D) 12

42. If the distance between (8, 0) and A is 7, then coordinates of the point A can not be

(A) (8, -7) (B) (8, 7)
(C) (1, 0) (D) (0, -8)

43. If $\sin\theta - \cos\theta = \sqrt{2} \sin(90^\circ - \theta)$, where $0^\circ < \theta < 90^\circ$, then $\tan\theta$

(A) $\sqrt{2} - 1$ (B) $\sqrt{2}$
(C) $1 - \sqrt{2}$ (D) $\sqrt{2} + 1$

44. ϕ is a acute angle such that

$\tan\phi = \frac{2}{3}$, then evaluate

$$\left(\frac{1 + \tan\phi}{\sin\phi + \cos\phi} \right) \cdot \left(\frac{1 - \cot\phi}{\sec\phi + \operatorname{cosec}\phi} \right)$$

(A) $-\frac{1}{5}$ (B) $-\frac{4}{\sqrt{13}}$
(C) $\frac{1}{5}$ (D) $\frac{4}{\sqrt{13}}$

45. Two men standing on the opposite sides of a flag staff measure the angles of elevation of the top of the flag staff as 30° and 60° . If the height of flag staff is 20 cm, then the men have a distance between each other of

(A) $\frac{80}{\sqrt{3}}$ m
(B) $80\sqrt{3}$ m
(C) $\frac{40}{\sqrt{3}}$ m
(D) $40\sqrt{3}$ m

MENTAL ABILITY

46. I went 15 m to the North, then turned West and covered 10 m, then turned South, and covered, 5 m then turned East and covered 10 m. In which direction am I now from my house?

- (A) North (B) South
(C) East (D) West

47. Shyam went 70 metre in the East before turning to his right. He went 10 metre before turning to his right again and went 10 metre from this point. From here he went 90 metre to the North. How far was he from the starting point?

- (A) 80 metre
(B) 100 metre
(C) 140 metre
(D) 260 metre

48. Arun said, "this girl is the wife of the grandson of my mother." Who is arun to the girl?

- (A) Father
(B) Grandfather
(C) Husband
(D) Father-in-law

49. Pointing to a man Asha said, "His brother's father is the only son of my grand father". How Asha is related to the man.

- (A) Mother (B) Aunt
(C) Sister (D) Daughter

50. Choose the alternative which is closely resembles the mirror image of the given combination.

MALAYALAM

- (1) MALAYALAM (2) MAJAYAJAM
(3) MVLAYALAM (4) MAGAYAGAM
(A) 1 (B) 2
(C) 3 (D) 4

51. Choose the alternative which is closely resembles the mirror image of the given combination.

EFFECTIVE

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

52. If A stands for +, B stands for −, C stands for ×, then what is the value of (10C4) A (4C4) B 6

- (A) 60 (B) 50
(C) 56 (D) 20

53. If A stands for ÷, B stands for ×, C stands for +, and D stands for −, then what is the value of 18B12A4C5D6 is ____

- (A) 36 (B) 59
(C) 53 (D) 70

54. 2, 3, 5, 7, ?

- (A) 9 (B) 10
(C) 11 (D) 14

55. 210, 120, ? , 24, 6, 0

- (A) 64 (B) 48
(C) 35 (D) 60

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56. Find the missing term in the given figure

17	11	19
12	13	16
25	4	?

- (A) 36 (B) 9
(C) 25 (D) 64
57. Find the missing term in the given figure
- 12 18 30 16 32 40 36 18 27
6 8 ?
(A) 18 (B) 12
(C) 9 (D) 6
58. X, U, S, P, N, K, I, ?
(A) J (B) K
(C) M (D) F
59. X, A, D, G, J, ?
(A) N (B) O
(C) M (D) P
60. If 'P' means '+', 'R' means 'x', 'S' means '-', 'T' means '÷' then what is the value of
5 R 9 P 7 S 9 T 3 P 6 = ?
(A) 54 (B) 128
(C) 59 (D) 55

BIOLOGY

61. Gastric juice is a mixture of secretory product of
(A) HCl
(B) Mucus
(C) Protein-digesting enzymes
(D) All of these
62. Normal rate of breathing is
(A) 8 to 10 per minute
(B) 15 to 18 per minute
(C) 20 to 21 per minute
(D) 25 to 30 per minute
63. Which of the following prevents collapsing of trachea?
(A) Muscles
(B) Diaphragm
(C) Air
(D) Cartilaginous rings
64. Trypsin changes
(A) Proteins into peptones and amino acids
(B) Fats into fatty acids
(C) Starch and glycogen into maltose
(D) Maltose into its components
65. The functional unit of the kidney is
(A) Neuron
(B) Nephron
(C) Neuroglia
(D) Axon

66. Heart pressure is measured by an instrument known as:

- (A) ECG
- (B) Stethoscope
- (C) Sphygmomanometer
- (D) EEG

67. In humans, right atrium receives.....blood from.....

- (A) Oxygenated, aorta
- (B) Deoxygenated, vena cava
- (C) Oxygenated, vena cava
- (D) Deoxygenated, aorta

68. Which of the following is a plant hormone ?

- (A) Insulin
- (B) Thyroxine
- (C) Oestrogen
- (D) Cytokinin

69. Which one of the following does not secrete any hormone?

- (A) Thyroid
- (B) Ovary
- (C) Testis
- (D) Spleen

70. Match the following.

Gland		Hormone	
(i)	Pituitary	a.	Insulin
(ii)	Pancreas	b.	Thyroxin
(iii)	Adrenal	c.	Estrogen
(iv)	Thyroid	d.	Growth hormone
(v)	Ovary	e.	Adrenalin

- (A) (i)→a (ii)→e (iii)→c (iv)→d (v)→b
- (B) (i)→d (ii)→a (iii)→e (iv)→b (v)→c
- (C) (i)→b (ii)→e (iii)→a (iv)→d (v)→c
- (D) (i)→d (ii)→e (iii)→a (iv)→b (v)→c

71. The chemical messengers in our body are called:

- (A) Enzymes
- (B) Hormones
- (C) Vitamins
- (D) Proteins

72. A feature of reproduction that is common to Amoeba, Spirogyra and Yeast is that

- (A) They reproduce asexually
- (B) They are all unicellular
- (C) They reproduce only sexually
- (D) They are all multicellular

73. Which among the following diseases is not sexually transmitted?

- (A) Syphilis
- (B) Typhoid
- (C) HIV-AIDS
- (D) Gonorrhea

74. Multiple fission occurs in:

- (A) Yeast
- (B) Amoeba
- (C) Hydra
- (D) Plasmodium

75. The process of reproduction which involves only a single parent to form an individual

- (A) sexual reproduction
- (B) asexual reproduction
- (C) none of these
- (D) Both A & B are correct

**ANSWER KEY**

PHYSICS		CHEMISTRY		MATHEMATICS		MENTAL ABILITY		BIOLOGY	
Q. NO.	Ans.	Q. NO.	Ans.	Q. NO.	Ans.	Q. NO.	Ans.	Q. NO.	Ans.
1.	D	16.	D	31.	A	46.	A	61.	D
2.	C	17.	C	32.	A	47.	B	62.	B
3.	D	18.	A	33.	B	48.	D	63.	D
4.	C	19.	D	34.	B	49.	C	64.	A
5.	A	20.	C	35.	A	50.	B	65.	B
6.	C	21.	A	36.	B	51.	A	66.	C
7.	B	22.	A	37.	B	52.	C	67.	B
8.	C	23.	A	38.	C	53.	C	68.	D
9.	B	24.	B	39.	A	54.	C	69.	D
10.	A	25.	B	40.	A	55.	B	70.	B
11.	B	26.	D	41.	B	56.	B	71.	B
12.	C	27.	D	42.	D	57.	C	72.	A
13.	B	28.	A	43.	D	58.	D	73.	B
14.	A	29.	C	44.	A	59.	C	74.	D
15.	B	30.	B	45.	A	60.	D	75.	B