MITTAL CLASSES

IIT-JEE | MEDICAL | FOUNDATION

Paper Code:08F–SP–A

SAMPLE PAPER

Class – VIII **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: _____

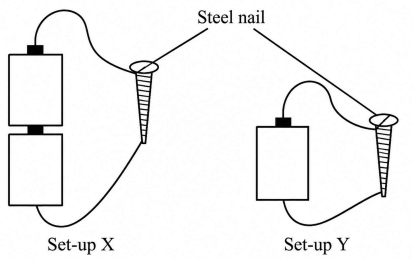
DATE: _____

PHYSICS

1. Joule's law of heating is expressed as:
(A) H = IRt (B) H = I^2Rt
(C) H = Vt (D) H = V/Rt

2. A fuse wire works on the principle of:
(A) Magnetic effect
(B) Chemical effect
(C) Heating effect
(D) Mechanical effect

3. Leena sets up an experiment as shown in the figure:



She finds out that the steel nail in **set-up X** attracts more iron pins than the steel nail in **set-up Y**. What could be the reasons for this?
(i) The batteries used in set-up X are more expensive.
(ii) There are more batteries used in set-up X.
(iii) The number of turns of coil around the nail in set-up Y is fewer than that in set-up X.
(iv) A longer wire is used in set-up X.
(A) (i) and (ii) only
(B) (ii), (iii) and (iv) only
(C) (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)

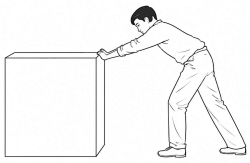
4. Match the column.

Column - A		Column - B	
(i)	Compass Needle Deflection	(P)	Depends on the length and cross-sectional area of the wire
(ii)	Magnetic Lines of Force	(Q)	Indicates the presence of a magnetic field and its direction
(iii)	Resistance of a Conductor	(R)	The core becomes magnetized only when current flows through the coil
(iv)	Electromagnet Activation	(S)	Demonstrates the magnetic effect of electric current (Oersted's discovery)
(v)	Conversion of Electrical Energy to Heat	(T)	Used in the filament of a standard incandescent bulb

(A) (i)–(S), (ii)–(Q), (iii)–(P), (iv)–(R), (v)–(T)
(B) (i)–(P), (ii)–(R), (iii)–(S), (iv)–(Q), (v)–(T)
(C) (i)–(Q), (ii)–(T), (iii)–(P), (iv)–(R), (v)–(S)
(D) (i)–(Q), (ii)–(P), (iii)–(R), (iv)–(S), (v)–(T)

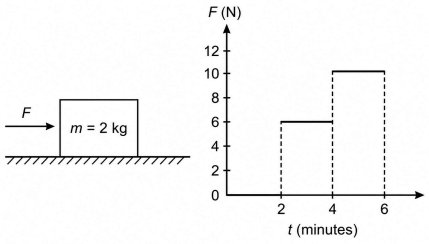
5. What effect can the application of force have on an object?
(A) Only change its shape
(B) Only stop motion
(C) Change speed, direction or shape
(D) Create motion only

6. In the given figure, a boy is pushing the box from right to left. The force of friction will act on the box



(A) From right to left (←).
(B) From left to right (→).
(C) Vertically downwards (↓).
(D) Vertically upwards (↑).

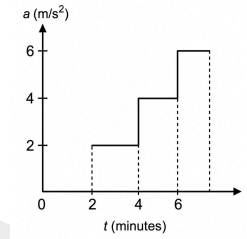
7. Mahesh is pushing a box on the ground. Frictional force between the box and the ground is 2 N. Mass of box is 2 kg. Variable force (F) applied by Mahesh with time is shown in the graph.



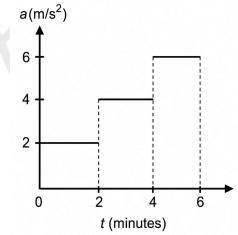
Which of the following is the correct acceleration–time (a–t) graph of the box?

$\left(\text{Acceleration of the box} = \frac{\text{Net force on the box}}{\text{Mass of box}}\right)$

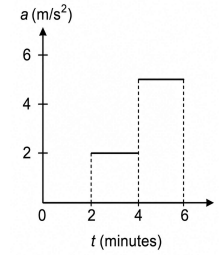
(A)



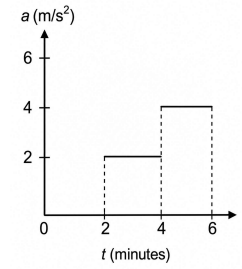
(B)



(C)



(D)



8. A solid metal sphere and a hollow plastic sphere have the same mass. If both are completely submerged in water, which will experience a greater buoyant force, and why?
   (A) The plastic sphere, because it displaces a larger volume of water.
   (B) Neither, because only objects that float experience a buoyant force.
   (C) Both will experience the same buoyant force because they have the same mass.
   (D) The metal sphere, because it is made of a denser material.

9. Women's sandals hurt more than the men's sport shoes because:
   (A) women are stronger in health
   (B) sport shoes have small heel
   (C) area of contact of sandal's heel is more
   (D) area of contact of sandal's heel is lesser

10. Following are the precautions one must take in the case a storm is accompanied by lightning. Which one of the following statements is not correct?
   (A) do not take shelter under a tall tree
   (B) do not take shelter inside a closed car
   (C) do not take shelter under an umbrella
   (D) do not take shelter under an open garage

11. How will the image formed by a convex lens be affected, if the central portion of the lens is wrapped in black paper, as shown in the figure?

   (A) No image will be formed.
   (B) Full image will be formed but it is less bright.
   (C) Full image will be formed but without the central portion.
   (D) Two images will be formed, one due to each exposed half.

12. Nature of light is:
   (A) Ray (B) Wave
   (C) Dual (D) None

13. Two plane mirrors are inclined to each other at an angle of 60°. If a ray of light incident on the first mirror is parallel to the second mirror, it is reflected from the second mirror.
   (A) Perpendicular to the first mirror
   (B) Parallel to the first mirror
   (C) Parallel to the second mirror
   (D) Perpendicular to the second mirror

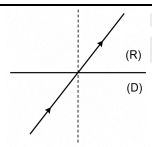
14. Match the column.

Column – A (Optical Component/Eye Part)		Column – B (Function/Characteristic)	
(i)	Ciliary Muscles	(P)	A transparent protective layer at the front of the eye
(ii)	Pupil	(Q)	Adjusts the focal length of the eye lens (accommodation)
(iii)	Cornea	(R)	Controls the amount of light entering the eye
(iv)	Cones (Retina Cells)	(S)	Responsible for color vision and bright light vision

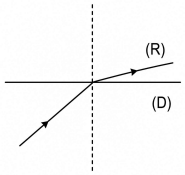
(A) (i)–(P), (ii)–(R), (iii)–(S), (iv)–(Q)
(B) (i)–(Q), (ii)–(S), (iii)–(R), (iv)–(P)
(C) (i)–(Q), (ii)–(R), (iii)–(P), (iv)–(S)
(D) (i)–(P), (ii)–(Q), (iii)–(R), (iv)–(S)

15. Which of the following shows the bending of light from denser (d) medium into a rarer (R) medium?

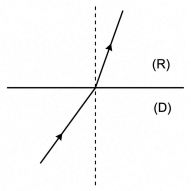
(A)



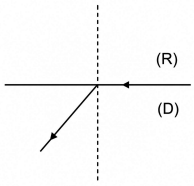
(B)



(C)



(D)



CHEMISTRY

16. Matter is made up of:
(A) Energy
(B) Tiny particles
(C) Light
(D) Sound

17. Particles in a solid:
(A) Move freely
(B) Vibrate in fixed positions
(C) Move past each other
(D) Are far apart

18. Which state of matter is highly compressible?
(A) Solid (B) Liquid
(C) Gas (D) None

19. The force of attraction between particles is strongest in:
(A) Solids
(B) Liquids
(C) Gases
(D) Plasma

20. A compound is:
(A) A mixture of elements
(B) A pure substance made of two or more elements chemically combined
(C) A heterogeneous mixture
(D) None of the above

21. Which element is used to fill balloons?
(A) Oxygen (B) Nitrogen
(C) Hydrogen (D) Helium

22. A mixture is useful because:
(A) It has fixed properties
(B) It can be separated easily
(C) It is a pure substance
(D) It cannot be made in the lab

23. Which of the following is a mineral used as a fuel?
(A) Bauxite (B) Coal
(C) Hematite (D) Gypsum

24. Which of the following statements is correct about elements?
(A) They can be broken down by chemical methods.
(B) They can exist as molecules or atoms.
(C) They are pure substances made of only one type of atom.
(D) All elements are metals.

25. Which of the following is true about compounds?
(A) They can be separated by physical methods.
(B) Their properties are the same as the constituent elements.
(C) Their properties are different from the constituent elements.
(D) They are always liquids.

26. The smallest particle of a compound that can exist independently and shows its chemical properties is called:
(A) Atom (B) Molecule
(C) Ion (D) Proton

27. Which of the following shows diffusion in gases?
(A) Smell of perfume spreading in a room
(B) Water flowing in a river
(C) Ice melting into water
(D) Crushing a solid

28. Which gas is used to fill balloons to make them float?
(A) Oxygen (B) Nitrogen
(C) Helium (D) Carbon dioxide

29. Which of the following is **NOT** true about gases?
(A) They have no fixed shape
(B) They have fixed volume
(C) They can be compressed
(D) Their particles move rapidly

30. What happens to the particles of a solid when it melts?
(A) They stop moving
(B) They vibrate more but remain fixed
(C) They start moving freely
(D) They get closer

MATHEMATICS

31. What is the volume of a cube whose each side is 4 cm?
(A) 48 cubic cm (B) 24 cubic cm
(C) 125 cubic cm (D) 64 cubic cm

32. _____ is the square of 25.
(A) 625 (B) 525
(C) 125 (D) 655

33. Find the missing number $7^5 = \frac{1}{7^{\square}}$?
(A) 2 (B) – 5
(C) 1 (D) none

34. Find the value of x, when $2^x = 4^4$
(A) x = 6 (B) x = 2
(C) x = 8 (D) x = – 5

35. In a base-8 system, what is the value of the number 345 (base 8) in base-10?
(A) 229 (B) 228
(C) 230 (D) 231

36. How is the number 27 written in Roman numerals?
(A) XVII (B) XXVII
(C) XXXII (D) XLVII

37. What will be the sum of interior angles of a polygon having 8 sides?
(A) 720° (B) 1080°
(C) 1260° (D) 1440°

38. In a parallelogram:
(A) Only one pair of sides is parallel
(B) Opposite sides are equal
(C) Diagonals are always equal in length
(D) All angles are 90°

39. According to parity rules, what is the result of Odd + Odd?
(A) Odd
(B) Even
(C) Depends on the numbers
(D) Always multiple of 3

40. For divisibility by 4, which part of the number must be checked?
(A) Units digit only
(B) Last two digits
(C) Sum of all digits
(D) Last three digits

41. When both numbers in a product ab are increased by 1, the increase in the product is:
(A) a + b (B) a + b + 1
(C) ab + 1 (D) $a^2 + b^2$

42. The product $(x - 1)(x + 1)(x^2 + 1)$ simplifies to
(A) $x^4 + 1$ (B) $x^4 - 1$
(B) $x^2 - 1$ (D) $(x - 1)^4$

43. A sum of 720 is divided in the ratio 2 : 7. The smaller share is:
(A) 160 (B) 140
(C) 200 (D) 180

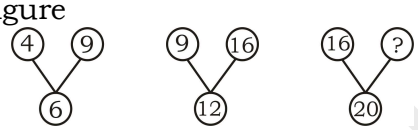
44. The fourth proportion of 5, 10 and 15 is:
(A) 20 (B) 25
(C) 30 (D) 35

45. Find the cube root of 110592
(A) 32 (B) 36
(C) 48 (D) 24

MENTAL ABILITY

46. 100, 50, $33\frac{1}{3}$, 25, 20,?
(A) 15 (B) $16\frac{1}{3}$
(C) $17\frac{2}{3}$ (D) $16\frac{2}{3}$

47. Find the missing term in the given figure



(A) 60 (B) 50
(C) 21 (D) 25

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) MALAYALAM (4) MALAYALAM

(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) EFFECTIVE (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

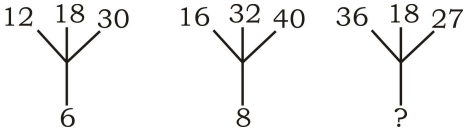
55. 210, 120, ? , 24, 6, 0
(A) 64 (B) 48
(C) 35 (D) 60

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



(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. Which of the following is the correct sequence?
(A) Large pressure difference → Gentle breeze
(B) Small pressure difference → Cyclone
(C) Small pressure difference → Gentle breeze
(D) No pressure difference → Gentle breeze

62. Which of the following is not a use of microorganisms?
(A) Making antibiotics
(B) Fixing nitrogen in the soil
(C) Increasing the spoilage of food
(D) Producing alcohol

63. Which tool allows us to see very small organisms that can't be seen with the naked eye?
(A) Telescope
(B) Binoculars
(C) Microscope
(D) Thermometer

64. Which microorganism is used to make curd from milk?
(A) Yeast (B) Lactobacillus
(C) Penicillium (D) Rhizobium

65. Which inference best explains why dough rises more in a warm place?


Raised Dough

(A) Warmth increases yeast metabolic activity up to an optimum, boosting CO_2 output.
(B) Warmth denatures yeast enzymes, accelerating gas release.
(C) Warmth converts sugar directly into oxygen.
(D) Warmth evaporates water, forming bubbles in dough.

66. Match the column.

Column - A		Column - B	
(i)	Yeast	(P)	Photosynthesis in plant cells
(ii)	Robert Hooke	(Q)	Fermentation and rising of dough
(iii)	Rhizobium	(R)	Nitrogen fixation in legume roots
(iv)	Methane	(S)	Main component of biogas
(v)	Chloroplast	(T)	Coined the term "cell"

(A) (i)–(Q), (ii)–(T), (iii)–(R), (iv)–(S), (v)–(P)
(B) (i)–(R), (ii)–(S), (iii)–(P), (iv)–(Q), (v)–(T)
(C) (i)–(S), (ii)–(T), (iii)–(R), (iv)–(Q), (v)–(P)
(D) (i)–(Q), (ii)–(P), (iii)–(R), (iv)–(S), (v)–(T)

67. In the onion peel preparation, the purpose of adding safranin is to:
(A) Kill microorganisms present on the peel
(B) Dehydrate the tissue for permanent mounting
(C) Increase contrast to visualize cell parts clearly
(D) Prevent air bubbles under the coverslip

Directions: In the following question, a statement of **Assertion (A)** is following by a statement of **Reason (R)**. Mark the correct choice as:
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

68. **Assertion (A):** Microbes help return nutrients to the soil by decomposing dead organisms.

Reason (R): Decomposition breaks down complex materials into simpler forms that plants can absorb.

69. What is the main purpose of following dinacharya and ritucharya in Ayurveda?
(A) To lose weight quickly
(B) To adjust lifestyle according to daily and seasonal changes for better health
(C) To build muscle strength
(D) To improve memory through herbs

Directions: In the following question, a statement of **Assertion (A)** is following by a statement of **Reason (R)**. Mark the correct choice as:
(A) Both A and R are true, and R is the correct explanation of A
(B) Both A and R are true, but R is not the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

70. **Assertion (A):** Vaccines can directly kill harmful bacteria in the human body.

Reason (R): Vaccines contain antibiotics that destroy pathogens.

71. The most common carrier of communicable diseases is:
(A) Ant (B) Housefly
(C) Dragonfly (D) Spider

72. Which disease is correctly classified as non-communicable?
(A) Typhoid (B) Chickenpox
(C) Diabetes (D) Measles

73. Which pairing is correct regarding water/food-borne diseases?
(A) Typhoid — virus infecting lungs
(B) Hepatitis A — virus infecting liver
(C) Cholera — protozoa infecting blood
(D) Ascariasis — bacteria infecting stomach

74. Match the column.

Column - A		Column - B	
(i)	Edward Jenner	(P)	Daily routine in Ayurveda
(ii)	Antibiotics	(Q)	Smallpox vaccine pioneer
(iii)	Mosquito nets	(R)	Measures air pollution level
(iv)	Dinacharya	(S)	Kill bacterial pathogens
(v)	AQI	(T)	Prevent vector-borne diseases

(A) (i)–(Q), (ii)–(S), (iii)–(T), (iv)–(P), (v)–(R)
(B) (i)–(R), (ii)–(S), (iii)–(T), (iv)–(P), (v)–(Q)
(C) (i)–(Q), (ii)–(T), (iii)–(S), (iv)–(R), (v)–(P)
(D) (i)–(Q), (ii)–(P), (iii)–(T), (iv)–(S), (v)–(R)

75. The vaccine for smallpox was discovered by:
(A) Robert Koch
(B) Alexander Fleming
(C) Sir Ronald Ross
(D) Edward Jenner

ANSWER KEY

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