MITTAL CLASSES

IIT-JEE | MEDICAL | FOUNDATION

Paper Code:10F-SP-1

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, and Date in the space provided at the bottom of this sheet.

NAME: _____

FATHER NAME: _____

CLASS: _____

DATE: _____

PHYSICS

1. Light shows:
(A) Random propagation
(B) Curvilinear propagation
(C) Rectilinear propagation
(D) None of these

2. According to laws of reflection of light:
(A) Angle of incidence is equal to the angle of reflection
(B) Angle of incidence is less than the angle of reflection
(C) Angle of incidence is greater than the angle of reflection
(D) None of these

3. The magnification of an object placed 10cm from a convex mirror of radius of curvature 20 cm will be:
(A) 0.2
(B) 0.5
(C) 1
(D) infinity

4. An object is placed 20cm from a convex mirror. Its image is formed 12cm from the mirror. Find the focal length of the mirror:
(A) 25cm
(B) 30cm
(C) 15cm
(D) 60cm

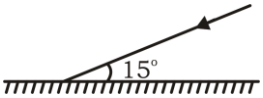
5. R.I. of glass w.r.t air is $\frac{3}{2}$, then the R.I. of air w.r.t. glass is:
(A) $\frac{3}{4}$ (B) $\frac{2}{3}$
(C) $\frac{1}{3}$ (D) 3

6. To get a real and inverted image of the same size as that of the object, the object Should be placed in front of the convex lens at:
(A) F
(B) 2F
(C) between F and 2F
(D) away from 2F, where F is focus

7. A white light falls on a glass prism, the least deviated colour is:
(A) Violet
(B) Orange
(C) Red
(D) Yellow

8. The least distance of distinct vision for a young adult with normal vision is about
(A) 25m
(B) 2.5cm
(C) 25cm
(D) 2.5m

9. When a ray of light strikes a plane mirror at an angle of 15° with the mirror, what will be the angle through which the ray gets deviated?



(A) 15°
(B) 30°
(C) 75°
(D) none of these

10. Two thin lenses of focal lengths 20cm and 25cm are placed in contact The effective power of the combination is:

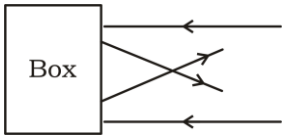
Space for rough work

(A) $\frac{1}{9}$ diopters
(B) 45 diopters
(C) 6 diopters
(D) 9 diopters

11. How should people wearing spectacles work with a microscope?
(A) They should keep on wearing their spectacles.
(B) They should never use the microscope.
(C) They should take off their spectacles.
(D) They may either put on their spectacles or they may take off their spectacles.

12. Motion pictures or cinematography make use of:
(A) Least distance of distinct vision
(B) Persistence of vision
(C) Power of accommodation
(D) None of these

13. In the given diagram the reflecting surface inside the box will be-



(A) Plane mirror
(B) Concave mirror
(C) Convex mirror
(D) Two inclined plane mirrors

14. The focal length of eye lens Is controlled by:
(A) Iris
(B) Cornea
(C) Ciliary muscles
(D) Optic nerve

15. The image formed on the retina of a human eye is:
(A) Temporary
(B) Permanent
(C) Blurred
(D) None of these

CHEMISTRY

16. Which of the following statements is/are true?
(A) The total mass of the system remains same in a chemical change.
(B) A chemical change is permanent and irreversible.
(C) A physical change is temporary and reversible.
(D) All of these

17. Which of the following reactions is not balanced ?
(A) $2NaHCO_3 \longrightarrow Na_2CO_3 + H_2O + CO_2$
(B) $2C_4H_{10} + 12O_2 \longrightarrow 8CO_2 + 10H_2O$
(C) $2Al + 6H_2O \longrightarrow 2Al(OH)_3 + 3H_2$
(D) $4NH_3 + 5O_2 \longrightarrow 4NO + 6H_2O$

18. In the reaction $FeSO_4 + x \longrightarrow Na_2SO_4 + Fe(OH)_2$, x is -
(A) Na_2SO_4
(B) H_2SO_4
(C) NaOH
(D) none of these

19. The antioxidant which is used to prevent rancidity in foods is
(A) butylated hydroxyl anisole
(B) sodium hydroxide
(C) sodium carbonate

Space for rough work

(D) methylated hydroxyl anisole

20. Which of the following reaction is/are a double displacement reaction(s) ?
(i) $AgNO_3 + NaBr \longrightarrow NaNO_3 + AgBr$
(ii) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$
(iii) $As_2O_3 + 3H_2S \longrightarrow As_2S_3 + 3H_2O$
(iv) $NaOH + HCl \longrightarrow NaCl + H_2O$
(A) (i) & (ii)
(B) only (iii)
(C) only (iv)
(D) (i) to (iv) all

21. H_2CO_3 is a –
(A) strong acid
(B) weak acid
(C) strong base
(D) weak base

22. Which of the following is the weakest base?
(A) NaOH
(B) NH_4OH
(C) KOH
(D) $Ca(OH)_2$

23. Materials used in the manufacture of bleaching powder are –
(A) lime stone and chlorine
(B) quick lime and chlorine
(C) slaked lime and HCl
(D) slaked lime and chlorine

24. Behaviour of hydrogen gas towards litmus paper is –
(A) neutral behavior
(B) turns red litmus to blue
(C) turns blue litmus to red
(D) litmus paper starts burning

25. Which of the following aqueous solutions will have highest pH?
(A) Sodium acetate
(B) Sodium chloride
(C) Ammonium phosphate
(D) Calcium chloride

26. Which of the following properties is not a characteristic of metals?
(A) Metallic lusture
(B) High density
(C) Hardness
(D) Low melting and boiling point

27. During formation of ionic bond -
(A) there is force of repulsion between two negative ions.
(B) there is force of repulsion between two positive ions.
(C) there is a force of attraction between positive& negative ions.
(D) None of these

28. Pure gold is equal to -
(A) 24 carat
(B) 100 carat
(C) 22 carat
(D) 1000 carat

29. Phosphorus is kept in -
(A) kerosene oil
(B) alcohol
(C) water
(D) ammonia

30. Molten sodium chloride conducts electricity due to the presence of
(A) free electrons
(B) free molecules
(C) atoms
(D) free ions

MATHEMATICS

Space for rough work

31. If $\left(\frac{a}{b}\right)^{x-1}=\left(\frac{b}{a}\right)^{x-3}$ then the value of x is
(A) 1
(B) 2
(C) 3
(D) 4

32. If $a^x=b, b^y=c$ and $c^z=a$, then value of xyz is
(A) 1
(B) 0
(C) –1
(D) a + b + c

33. One of the factors of the expression $x^4 + 8x$ is
(A) $x^2 + 2$
(B) $x^2 + 8$
(C) x + 2
(D) x – 2

34. If $x+\frac{1}{x}=3$, then the value of $x^6+\frac{1}{x^6}$ is
(A) 927
(B) 114
(C) 364
(D) 322

35. If $\frac{15}{x}+\frac{2}{y}=17$ and x = 3, then value of y is
(A) $\frac{1}{6}$
(B) $\frac{1}{5}$
(C) $-\frac{1}{6}$
(D) $-\frac{1}{5}$

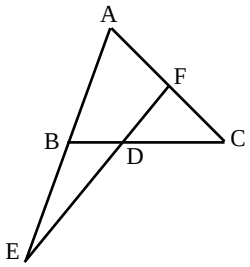
36. The difference between a two-digit given number and the number obtained by interchanging the digits is 27. The sum of the two digits is .....
(A) 3
(B) 5
(C) 7
(D) cannot be found

37. In what ratio does the point $P\left[3,\frac{11}{5}\right]$ divides the line segment, joining the points (5, 0) and (0, 4)?
(A) 2 : 3
(B) 3 : 4
(C) 4 : 3
(D) 3 : 2

38. If the points (1, 1), (–1, –1) and $(-\sqrt{3}, k)$ are the vertices of an equilateral triangle then the value of k is:
(A) 1
(B) $\sqrt{3}$
(C) –1
(D) $-\sqrt{2}$

39. In the given figure $\frac{BD}{CD}=\frac{3}{4}$ and AE = 6BE, then $\frac{CF}{AF}=$ _____

Space for rough work



(A) 2/9
(B) 4/6
(C) 3/8
(D) 5/9

40. The length of sides of triangle are integers and its perimeter is 14. How many such distinct triangles are possible?
(A) 6
(B) 5
(C) 4
(D) 3

41. If A + B = 90° and A = 2B then the value of cos 2B is
(A) $-\frac{1}{2}$
(B) $\frac{1}{2}$
(C) $\frac{\sqrt{3}}{2}$
(D) 1

42. If tan θ + sec θ = 4, then the value of sin θ is
(A) $\frac{15}{28}$
(B) $\frac{8}{15}$
(C) $\frac{15}{17}$
(D) $\frac{3}{5}$

43. The circumference of a circle and perimeter of a square are equal. The ratio of their areas is
(A) π : 4
(B) 2 :π
(C) π : 2
(D) 4 : π

44. A thin wire is bent into the form of a circle of radius 7 cm. If a square is made out of this wire, the side of the square would be:
(A) 7 cm
(B) 14 cm
(C) 11 cm
(D) 22 cm

45. The probability of getting a number greater than 2 by throwing a fair dice is
(A) 2/3
(B) 1/3
(C) 1
(D) 3/5

MENTAL ABILITY

46. Anil left home and cycled 10 km Southwards, turned right and cycled 5 km & turned right and cycled 10

Space for rough work

km and turned left and cycled 10 km. How many kilometer will he have to cycle to reach his home straight?
(A) 10 km
(B) 15 km
(C) 20 km
(D) 25 km

47. Amar travels one km due East, then 5 km due South, then 2 km due East and finally 9 km due North. How far is from the starting point?
(A) 16 km
(B) 8 km
(C) 6km
(D) 5 km

48. Introducing Radha, Kalpana said "her mother is alone daughter of my mother". How Kalpana is related to Radha?
(A) Mother
(B) Sister
(C) Niece
(D) Daughter

49. Rahul told Anand. "Yesterday I defeated the only brother of the daughter of my grandmother." Whom did Rahul defeat?
(A) Son
(B) Father
(C) Brother
(D) Father-in-law

50. If Sripal's birthday falls on Thursday 20th March, 2000, then on which day of the week his birthday falls in the year 2001?
(A) Wednesday
(B) Friday
(C) Saturday
(D) Sunday

51. If the first day of a leap year is Monday, then what day will be on the last day of that year?
(A) Wednesday
(B) Tuesday
(C) Thursday
(D) Sunday

Directions: (52 to 53) Read the following information and answer the questions given below it. Five girls are standing in a circle facing the centre. Suman is between Lata and Asha. Mamta is to the right of Lata.

52. Who is to the left of Asha if Rajani is the fifth girl?
(A) Mamta
(B) Suman
(C) Lata
(D) Rajani

53. If Suman and Mamta interchange their positions, who will be fourth to the left of Rajani?
(A) Lata
(B) Suman
(C) Asha
(D) Mamta

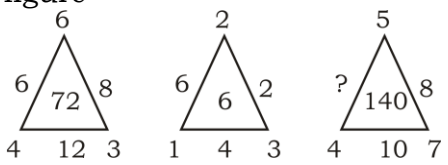
54. 1, 4, 27, 16, 125, 36, ?
(A) 216
(B) 343
(C) 64
(D) 49

55. 5, 6, 13, 26, 45, ?
(A) 68
(B) 74
(C) 70
(D) 82

56. Find the missing term in the given

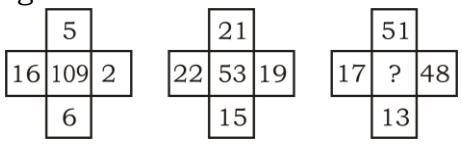
Space for rough work

figure



(A) 16
(B) 14
(C) 20
(D) 22

57. Find the missing term in the given figure



(A) 25
(B) 129
(C) 7
(D) 49

58. 2B, 4C, 8E, 14H, ?
(A) 22L
(B) 24L
(C) 22K
(D) 2M

59. B3M, E7J, H15G, K31D, ?
(A) N65A
(B) O63A
(C) N63A
(D) N63Z

60. Find the 4 digit number ABCD such that ABCD × 9 = DCBA.
(A) 1089
(B) 9801
(C) Both A and B
(D) None of these

BIOLOGY

61. Plants are –
(A) chemoautotrophs
(B) Photoautotrophs
(C) Heterotrophs
(D) none of these

62. Which of the following requires no enzyme?
(A) Light reaction
(B) Photolysis of water
(C) Dark reaction
(D) Carboxylation

63. Compensation point occurs :
(A) When intensity of light is high
(B) During dark
(C) During morning and evening hours
(D) During mid-day

64. Uriniferous tubules of a kidney are concerned with formation of
(A) glucose
(B) amino acids
(C) hormones
(D) urine

65. Function of loop of Henle is
(A) conservation of water
(B) formation of urine
(C) filtration of blood
(D) passage of urine

66. Functional unit of kidney is
(A) Nephron
(B) Nephritis
(C) Neuron
(D) Loop of Henle

67. Urine is always fluid except in:

Space for rough work

(A) Birds
(B) Humans
(C) Amphibians
(D) Mammals

68. The common immediate source of energy for cellular activity is
(A) NAD
(B) ATP
(C) DNA
(D) RNA

69. More energy production occurs in which respiration
(A) aerobic respiration
(B) anaerobic respiration
(C) same energy in both
(D) energy production is uncertain

70. Active transport of mineral in a plant requires
(A) a carrier protein
(B) a supply of energy
(C) a molecule against its concentration gradient
(D) all of these

71. Companion cells are usually seen to be associated with
(A) fibres tissue
(B) parenchyma tissue
(C) xylem tissue
(D) sieve tissue

72. Valves are found in veins to check the backflow of blood flowing under
(A) high pressure
(B) low pressure
(C) no pressure
(D) atmospheric pressure.

73. Phytohormones are
(A) homones regulating secondary growth
(B) homones regulating secondary growth
(C) growth regulators synthesized by plants and influencing physiological processes
(D) hormones regulating flowering

74. A high concentration of synthetic auxins is generally used for
(A) weed control
(B) enhancing root initiation
(C) controlling of cell enlargement
(D) preventing the growth of the lateral buds

75. The pineal body is considered as
(A) an endocrine gland
(B) an organ concerned with voluntary actions
(C) an organ concerned with vision
(D) a vestige of third eye and endocrine gland

Space for rough work