Monthly Progessive Test

Class: IX

Subject: PCMB

Academic Excellence Programme TECHNO ACE

Test Booklet No.: MPT01 **Test Date:** 22042024

Time: 180 mins **Full Marks: 200**

Important Instructions :

1. The Test is of 180 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 26 to 50 contain Chemistry, Questions 51 to 75 contain Mathematics, Questions 76 to 100 contain Biology.
2. Each question carries 2 marks. For each correct response, the candidate will get 2 marks. There is no negative mark for wrong response. The maximum mark is 200.
3. Use Blue / Black Ball point Pen only for writing particulars marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The CODE for this Booklet is Off Line MPT0122042024.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your UID No. anywhere else except in the specified space. Use of white fluid for correction is NOT permissible on the Answer Sheet. **Do not scrible or write on or beyond discrete bars of OMR Sheet at both sides**.
8. Each candidate must show on-demand his/her Registration document to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic Calculator/Cellphone is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
13. There is no scope for altering response mark in Answer Sheet.

Space For Rough Works

Physics

1. 1.0 N-m =

   Ⓐ 10^9 dyne–cm Ⓑ 10^7 dyne–cm Ⓒ 10^5 dyne–cm Ⓓ 10^{10} dyne–cm

2. S.I unit of force is

   Ⓐ watt Ⓑ dyne Ⓒ newton Ⓓ poundal

3. If 8 minute and 20 s = x second. Then x =

   Ⓐ 500 Ⓑ 820 Ⓒ 300 Ⓓ 400

4. kg·m multiplied by $m \cdot sec^{-2}$ is S.I. unit of

   Ⓐ Force Ⓑ Momentum Ⓒ Energy Ⓓ None of these

5. Power is directly proportional to velocity and as well as force, then find out power in relation with force and velocity.

   Ⓐ Fv Ⓑ F^2v Ⓒ Fv^2 Ⓓ $\frac{F}{v}$

6. The dimensional formula for force per unit linear mass density of wire is the same as that for

   Ⓐ velocity Ⓑ acceleration Ⓒ $(\text{velocity})^2$ Ⓓ $\sqrt{\text{acceleration}}$

7. If one main scale division is 2 mm and total number of vernier scale division is 40, then least count of vernier scale is

   Ⓐ 0.1 mm Ⓑ 0.02 mm Ⓒ 0.2 mm Ⓓ none of these

8. What do we call $10^9\ \Omega$?

   Ⓐ Milli ohm Ⓑ Kilo ohm Ⓒ Mega ohm Ⓓ Giga ohm

9. If least main scale division is 1 mm what is the least count of Vernier scale?

   Ⓐ 1 mm Ⓑ 10 mm Ⓒ 0.1 mm Ⓓ 0.01 mm

10. What is the SI unit of acceleration due to gravity?

    Ⓐ $m\,s^{-2}$ Ⓑ $m^{-1}s^{-1}$ Ⓒ $m\,s^2$ Ⓓ $m^2\,s$

11. The SI unit for momentum is

    Ⓐ $kg^{-1}\,m\,s$ Ⓑ $kg\,m^{-1}\,s$ Ⓒ $kg\,m\,s^{-1}$ Ⓓ $kg\,m\,s$

12. The dimension of momentum is the same as that of

    Ⓐ Force Ⓑ Impulse Ⓒ Work Ⓓ Energy

13. How much is 1 litre?

Ⓐ 1000 cc Ⓑ 10^{-3} m^3

Ⓒ Both Ⓐ and Ⓑ are correct Ⓓ None of these

14. What is the SI unit of amount of substance?

Ⓐ Meter Ⓑ Second Ⓒ Candela Ⓓ Mole

15. What is the SI unit of plane angle?

Ⓐ kelvin Ⓑ kilogram Ⓒ ampere Ⓓ radian

16. The derived unit of force is

Ⓐ N Ⓑ kg m/s^2 Ⓒ Dyne Ⓓ Joule

17. The unit of impulse is

Ⓐ Ns Ⓑ kg m/s

Ⓒ Dyne · s Ⓓ All of these are correct

18. In general, least count of main scale of vernier caliper is

Ⓐ 1 mm Ⓑ 1 cm Ⓒ 0.1 mm Ⓓ 0.01 mm

19. In general, least count of vernier scale is

Ⓐ 0.1 mm Ⓑ 0.01 mm Ⓒ 0.5 mm Ⓓ 0.05 mm

20. If main scale reading of slide calipre is 20 MSD and main scale least count is 0.5 mm, then value of main scale reading is

Ⓐ 10 mm Ⓑ 5 mm Ⓒ 12 mm Ⓓ 20 mm

21. Dimension of [Force × $time^2$]

Ⓐ ML Ⓑ MLT Ⓒ MT Ⓓ LT

22. Dimension of volume

Ⓐ L^2 Ⓑ L^3 Ⓒ L Ⓓ LT

23. Dimension of pressure × area × $(time)^2$

Ⓐ MLT Ⓑ ML Ⓒ MLT^2 Ⓓ ML^2T

24. Dimension of [length] – [length]

Ⓐ L^3 Ⓑ L^2 Ⓒ L Ⓓ Dimensionless

25. If strain is defined as extension of length/original length, then dimension of strain is

Ⓐ MLT Ⓑ ML^2T Ⓒ MLT^2 Ⓓ Dimensionless

Chemistry

26. The number of electrons present in K shells of hydrogen and helium are respectively

Ⓐ 2 and 1 Ⓑ 2 and 2 Ⓒ 1 and 2 Ⓓ 1 and 1

27. The charge possessed by permanganate is the same as _____ radical

Ⓐ magnesium Ⓑ bisulphate Ⓒ sulphate Ⓓ potassium

28. If the folmulae of respective chlorides of X and Y are XCl_3 and YCl_4 respectively, then the valencies of X and Y are

Ⓐ 3 and 2 Ⓑ 3 and 4 Ⓒ 1 and 1 Ⓓ 1 and 4

29. The formula of a compound when a positive radical with valency 2 and negative radical with valency 1 combine is _____ [A = metal, B = non-metal]

Ⓐ BA Ⓑ A_2B Ⓒ AB_2 Ⓓ AB

30. Which of the following element is chemically inactive?

Ⓐ Nitrogen Ⓑ Neon Ⓒ Hydrogen Ⓓ Copper

31. The formula of chloride of corresponding metal is MCl_2. What is the valency of the metal?

Ⓐ 4 Ⓑ 3 Ⓒ 1 Ⓓ 2

32. Among the noble gases which gas does not have octet configuration?

Ⓐ Neon Ⓑ Helium Ⓒ Argon Ⓓ Xenon

33. Which is a negative radical among the following?

Ⓐ Silicate Ⓑ Ammonium Ⓒ Ferrous Ⓓ Chromium

34. If a solid non-metal 'X' forms oxide type X_2O_5, then the formula of its corresponding chloride is

Ⓐ XCl_3 Ⓑ XCl_5 Ⓒ X_2Cl_5 Ⓓ X_3Cl_2

35. If the formula of a metal nitrite is $M(NO_2)_2$ then the formula of its dihydrogen phosphate is

Ⓐ $M(PO_4)$ Ⓑ $MHPO_4$ Ⓒ $M(H_2PO_4)_2$ Ⓓ M_2HPO_4

36. Identify the number of neutrons present in a pair of elements with atomic numbers 20 and 13, if the mass numbers are 40 and 27 respectively

Ⓐ 20 and 13 Ⓑ 20 and 15 Ⓒ 20 and 17 Ⓓ 20 and 14

37. Identify the formula of the corresponding hydride of a non-metal 'X' which attains octet by gaining three electrons

Ⓐ XH Ⓑ XH_2 Ⓒ XH_3 Ⓓ X_2H_3

38. The number of positively charged particles in the elements A, B, C are 10, 18, 8 respectively, identify the element which is chemically reactive?

Ⓐ A Ⓑ B Ⓒ C Ⓓ Both Ⓐ and Ⓑ

39. If a uninegative ion has 10 neutrons and 9 protons, then the electronic configuration of the atom of the element is

Ⓐ 2, 8, 1 Ⓑ 2, 7 Ⓒ 2, 8 Ⓓ 2, 8, 8

40. Which radical has two unit negative charge on it?

Ⓐ Carbonate Ⓑ Nitrate Ⓒ Chloride Ⓓ Phosphate

41. Which of the following is an element?

Ⓐ Carbon dioxide Ⓑ Water Ⓒ Air Ⓓ Nitrogen

42. The short form of an element is known as

Ⓐ Compound Ⓑ Molecule Ⓒ Symbol Ⓓ Mixture

43. How many elements are there altogether?

Ⓐ 80 Ⓑ 98 Ⓒ 108 Ⓓ 118

44. Which of the following is an inert gas?

Ⓐ Arsenic Ⓑ Argon Ⓒ Carbon Ⓓ Iron

45. Which of the following is a non-metallic liquid?

Ⓐ Mercury Ⓑ Bromine Ⓒ Hydrogen Ⓓ Sodium

46. Smallest particle of the element which may or may not exist independently but take part in the chemical reactions is known as ?

Ⓐ Atom Ⓑ Molecule Ⓒ Symbol Ⓓ Metal

47. Which of the following is a metalloid?

Ⓐ Carbon Ⓑ Arsenic Ⓒ Iron Ⓓ Sodium

48. The symbol of cobalt is

Ⓐ Co Ⓑ Cb Ⓒ Ct Ⓓ C

49. The chemical formula of potassium permanganate is

Ⓐ $PMnO_4$ Ⓑ $PoMnO_4$ Ⓒ $KMnO_4$ Ⓓ $PtMnO_4$

50. The number of neutrons present in $^{39}K_{19}$ is?

Ⓐ 39 Ⓑ 19 Ⓒ 58 Ⓓ 20

Mathematics

51. The sum of a rational number and an irrational number

Ⓐ is irrational Ⓑ is rational Ⓒ may be rational Ⓓ may be irrational

52. If $\sqrt{13-x\sqrt{10}}=\sqrt{8}+\sqrt{5}$ then find the value of x

Ⓐ -5 Ⓑ -6 Ⓒ -4 Ⓓ -2

53. If $2^{2008}-2^{2007}-2^{2006}+2^{2005}=k\times 2^{2005}$ then the value of k is equal to

Ⓐ 2 Ⓑ 3 Ⓒ 4 Ⓓ 5

54. The value of $\left(\frac{x^b}{x^c}\right)^{\frac{1}{ca}}\cdot\left(\frac{x^c}{x^a}\right)^{\frac{1}{ca}}\cdot\left(\frac{x^a}{x^b}\right)^{\frac{1}{ab}}$ is equal to

Ⓐ x Ⓑ $\frac{1}{x}$ Ⓒ 1 Ⓓ -1

55. Which of the following is a rational number

Ⓐ $\sqrt[4]{16}$ Ⓑ $\sqrt[3]{121}$ Ⓒ $\sqrt[4]{196}$ Ⓓ $\sqrt[5]{81}$

56. Representation of $3.\overline{6}$ in $\frac{p}{q}$ form is

Ⓐ $\frac{11}{3}$ Ⓑ $\frac{3}{11}$ Ⓒ $\frac{10}{10}$ Ⓓ $\frac{33}{10}$

57. If $\frac{100\sqrt{25}}{\sqrt{25}+x}=50$, then the value of x is

Ⓐ 25 Ⓑ $\frac{1}{\sqrt{25}}$ Ⓒ $\sqrt{25}$ Ⓓ $\frac{1}{25}$

58. Every rational number is :

Ⓐ Whole number Ⓑ Natural number Ⓒ Integer Ⓓ Real number

59. The irrational number between 2 and 2.5 is

Ⓐ $\sqrt{11}$ Ⓑ $\sqrt{22.5}$ Ⓒ $\sqrt{5}$ Ⓓ $\sqrt{12.5}$

60. The value of $(256)^{0.16} \times (256)^{0.09}$

Ⓐ 4 Ⓑ 16 Ⓒ 64 Ⓓ 256.25

61. Expression of 2.2323 ..... in the form of $\frac{a}{b}$ is

Ⓐ $\frac{221}{99}$ Ⓑ $\frac{75}{31}$ Ⓒ $\frac{7}{99}$ Ⓓ $\frac{223}{99}$

62. $3\sqrt{6}+4\sqrt{6}$ is equal to

Ⓐ $6\sqrt{6}$ Ⓑ $4\sqrt{12}$ Ⓒ $7\sqrt{12}$ Ⓓ $7\sqrt{6}$

63. The value of $\sqrt[3]{216}-\sqrt[3]{125}$

Ⓐ 1 Ⓑ –1 Ⓒ $\sqrt[3]{91}$ Ⓓ $\frac{6}{5}$

64. If $x=\frac{\sqrt{7}}{5}$ and $\frac{5}{x}=p\sqrt{7}$, then the value of p is

Ⓐ $\frac{5}{\sqrt{7}}$ Ⓑ $\frac{25}{7}$ Ⓒ $\frac{7}{25}$ Ⓓ $\frac{\sqrt{7}}{5}$

65. The co-prime numbers are

Ⓐ 2, 3 Ⓑ 2, 4 Ⓒ 2, 6 Ⓓ 2, 110

66. If $x^{\frac{1}{12}}=49^{\frac{1}{24}}$, then find the value of x.

Ⓐ 49 Ⓑ 2 Ⓒ 12 Ⓓ 7

67. If $x-\frac{1}{x}=\sqrt{3}$, then $x^2+\frac{1}{x^2}$ equals

Ⓐ 5 Ⓑ $3\sqrt{3}$ Ⓒ 3 Ⓓ $\sqrt{3}$

68. $\frac{1}{\sqrt{4}-\sqrt{3}}=?$

Ⓐ $\left(2+\sqrt{3}\right)$ Ⓑ $\left(2-\sqrt{3}\right)$ Ⓒ 1 Ⓓ None of these

69. On simplifying $\left(\sqrt{5}-\sqrt{7}\right)^2$, we get

Ⓐ 12 Ⓑ $\sqrt{35}$ Ⓒ $\sqrt{7}+\sqrt{5}$ Ⓓ $12-2\sqrt{35}$

70. If $x=\frac{1}{3-2\sqrt{2}}$, $y=\frac{1}{3+2\sqrt{2}}$, then the value of x^2+y^2 is

Ⓐ 34 Ⓑ 35 Ⓒ 36 Ⓓ 37

71. An irrational number between 3 and 4 is

Ⓐ $\sqrt{11}$ Ⓑ 3.5 Ⓒ $\sqrt{8}$ Ⓓ $\sqrt{9}$

72. If $x=2+\sqrt{3}$, $y=\frac{1}{2+\sqrt{3}}$, then the value of $x+y$ is

Ⓐ 4 Ⓑ 3 Ⓒ 1 Ⓓ –4

73. If $4^{2x-1}=32$, then the value of x is

Ⓐ $\frac{4}{7}$ Ⓑ $\frac{7}{4}$ Ⓒ $\frac{5}{7}$ Ⓓ None of these

74. If $2^x=3^y=6^z$, then

Ⓐ $\frac{1}{x}+\frac{1}{y}=\frac{1}{z}$ Ⓑ $\frac{1}{x}-\frac{1}{y}=\frac{1}{z}$ Ⓒ $\frac{1}{x}+\frac{1}{z}=\frac{1}{y}$ Ⓓ None of these

75. If $\sqrt{x}+\frac{1}{\sqrt{x}}=2$, then the value of $x^8+\frac{1}{x^8}$ is

Ⓐ 2 Ⓑ 3 Ⓒ $\sqrt{2}$ Ⓓ 4

Biology

76. The main difference between an animal cell and a plant cell is :

Ⓐ Plant cells lack rigid cell wall Ⓑ Animal cells lack rigid cell wall
Ⓒ Plant cells possess small vacuoles Ⓓ Animal cells possess large vacuoles

77. An example of unicellular animal is :

Ⓐ *Amoeba* Ⓑ *Paramoecium* Ⓒ *Plasmodium* Ⓓ All of these

78. Plasma membrane or unit membrane is majorly made up of—

Ⓐ Phosphoprotein and carbohydrate Ⓑ Protein and fat/phospholipid
Ⓒ Phospholipid/fat and carbohydrate Ⓓ Carbohydrate and fat/phospholipid

79. Controlling centre of a cell is :

Ⓐ Nucleus Ⓑ Nucleolus Ⓒ Chloroplast Ⓓ Ribosome

80. A prokaryotic cell does not possess :

Ⓐ Nuclear membrane Ⓑ Plasma membrane
Ⓒ Cell wall Ⓓ Cytoplasm

81. Who coined the term 'protoplasm'?

Ⓐ Dujardin Ⓑ Purkinje Ⓒ Nirenberg Ⓓ Francis P. Roux

82. Protoplasm, excluding nucleus, is called : _____

Ⓐ Cytoplasm Ⓑ Endoplasm Ⓒ Ectoplasm Ⓓ Neuroplasm

83. Who discovered the cell?

Ⓐ Robert Hooke Ⓑ Purkinje Ⓒ Robert Brown Ⓓ Davson

84. The plasma membrane of all cells is _____

Ⓐ Impermeable Ⓑ Semi permeable
Ⓒ Permeable Ⓓ Selectively permeable

85. In plant cells, the cell wall is—

Ⓐ Dynamic & living Ⓑ Rigid & non living
Ⓒ Dynamic & non living Ⓓ Rigid & living

86. Which of the following may be identified as acellular?

Ⓐ Bacteria Ⓑ *Paramoecium* Ⓒ Virus Ⓓ *Amoeba*

87. Nucleus was first detected by—

Ⓐ Robert Hooke Ⓑ A. V. Leeuwenhoek
Ⓒ Robert Brown Ⓓ Fontana

88. Identify the human cell which lacks a nucleus—

Ⓐ WBC Ⓑ RBC Ⓒ Egg Ⓓ Nerve cells

89. Which of the following is called the 'brain of the cell' ?

Ⓐ Nucleus Ⓑ Mitochondria
Ⓒ Ribosome Ⓓ Plasma membrane

90. Which one is not a part of nucleus ?

Ⓐ Chromatin Ⓑ Nucleolus Ⓒ Centrosome Ⓓ Nucleoplasm

91. Which of the following cells do not have a well defined nucleus?

Ⓐ Egg cell Ⓑ Neuron Ⓒ Bacterial cell Ⓓ All

92. Which structure contains the genetic material of the cell?

Ⓐ Nucleus Ⓑ Ribosomes
Ⓒ Golgi apparatus Ⓓ Endoplasmic reticulum

93. Which structure is responsible for maintaining the shape of the cell and providing support?

Ⓐ Ribosome Ⓑ Cytoplasm Ⓒ Cell wall Ⓓ Nucleus

94. When a raisin is put in water, it swells up after sometime due to the process of:

Ⓐ Diffusion Ⓑ Exosmosis
Ⓒ Endosmosis Ⓓ None

95. The number of chromosomes found in prokaryotic cells are—

Ⓐ One Ⓑ Two Ⓒ Three Ⓓ Four

96. Which of the following organisms show a cell wall around their cells?

Ⓐ Bacteria Ⓑ Plants Ⓒ Fungi Ⓓ All

97. Which structure regulates the movement of substances into and out of the cell?

Ⓐ Nucleus Ⓑ Cell membrane
Ⓒ Ribosomes Ⓓ Endoplasmic reticulum

98. Cell Theory was proposed by

Ⓐ Robert Hooke & Robert Brown Ⓑ Kolliker & Benda
Ⓒ Schleiden & Schwann Ⓓ Leeuwenhoek & Fontana

99. Which structure among the following was discovered by Fontana?

Ⓐ Nuclear membrane Ⓑ Nucleoplasm
Ⓒ Nucleolus Ⓓ Nuclear pores

100. The largest animal cell is _____

Ⓐ egg of parrots Ⓑ egg of snakes Ⓒ egg of ostrich Ⓓ egg of lizards

Space For Rough Works