



# Monthly Progressive Test

Class: X

Subject: PCMB

**A**cademic  
**E**xcellence  
**P**rogramme  
**TECHNO ACE**

Test Booklet No.: MPT01

Test Date: 

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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 scibble 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. An object is at 20 cm in front of a plane mirror. The mirror is moved 10 cm away from the object. then the distance between the two positions of the image  
 (A) 20 cm                      (B) 15 cm                      (C) 10 cm                      (D) 25 cm
2. The incident ray and the reflected ray from a mirror (plane) are mutually perpendicular to each other. The angle of incidence be  $x^\circ$ ; then  $x^\circ - 30^\circ =$   
 (A)  $20^\circ$                       (B)  $15^\circ$                       (C)  $35^\circ$                       (D)  $25^\circ$
3. If a man runs at the rate of 5 m/s towards a plane mirror along normal line of the mirror, then at what rate will he approach his image formed by the mirror.  
 (A) 5 m/s                      (B) 10 m/s                      (C) 15 m/s                      (D) 20 m/s
4. A man standing in front of a plane mirror finds his image at a distance 4 m from himself. Then the distance of the man from plane mirror is  
 (A) 1 m                      (B) 2 m                      (C) 2.5 m                      (D) 1.5 m
5. If R is the radius of curvature of a spherical mirror and f is its focal length, then:  
 (A)  $R = f$                       (B)  $R = \frac{f}{2}$                       (C)  $R = 3f$                       (D)  $R = 2f$
6. A diverging mirror is  
 (A) a convex mirror                      (B) a concave mirror  
 (C) a shaving mirror                      (D) a plane mirror
7. While using a concave mirror as a shaving mirror  
 (A) the object should be close to the concave mirror  
 (B) can be used as make-up mirrors  
 (C) can be used to see the larger image of the teeth by the dentist  
 (D) all the above are correct
8. Select the non-luminous object  
 (A) Electric bulb (on condition)                      (B) Sun  
 (C) Moon                      (D) Burning candle
9. If the incident ray makes an angle  $0^\circ$  with the normal, then the angle of reflection is  
 (A)  $0^\circ$                       (B)  $30^\circ$                       (C)  $60^\circ$                       (D)  $90^\circ$
10. If the angle of incidence (for reflection) is  $30^\circ$ , then angle of deviation is  
 (A)  $90^\circ$                       (B)  $110^\circ$                       (C)  $100^\circ$                       (D)  $120^\circ$

11. In case of irregular reflection, at each point on the surface of the reflector  
Ⓐ Laws of reflection are valid Ⓑ Laws of reflection are invalid  
Ⓒ Some times laws of reflection are valid Ⓓ None of these
12. The focal length of a spherical mirror whose radius of curvature is 40 cm  
Ⓐ 15 cm Ⓑ 30 cm Ⓒ 25 cm Ⓓ 20 cm
13. When a ray of light which is parallel to the principal axis of a concave mirror, then reflected ray passes through  
Ⓐ Centre of curvature Ⓑ Pole  
Ⓒ Focus Ⓓ None of the above
14. If incident ray passes through the centre of curvature of a concave mirror, then reflected ray will pass through  
Ⓐ Centre of curvature Ⓑ Pole  
Ⓒ Focus Ⓓ None of the above
15. If incident ray passes through the focus of a concave mirror, then reflected ray becomes  
Ⓐ Inclined to the principal axis Ⓑ Parallel to the principal axis  
Ⓒ No reflected ray Ⓓ None of these
16. In, rectilinear property of light:  
Ⓐ Light travels in a Straight line Ⓑ Casting of shadow of an object  
Ⓒ Both Ⓐ and Ⓑ are correct Ⓓ None of these
17. When an object is placed between the focus and centre of curvature of a concave mirror the image formed is  
Ⓐ diminished Ⓑ magnified  
Ⓒ same size of object Ⓓ None of these
18. When an object is placed at the centre of curvature of a concave mirror the image formed is  
Ⓐ diminished Ⓑ magnified Ⓒ same size of object Ⓓ none of these
19. When a plane mirror rotates  $30^\circ$ , then the rotation of reflected is  
Ⓐ  $30^\circ$  Ⓑ  $45^\circ$  Ⓒ  $90^\circ$  Ⓓ  $60^\circ$
20. If the concave mirror is immersed completely in water, then shift of image with respect to when it was kept in air  
Ⓐ 10 cm Ⓑ 5 cm Ⓒ 15 cm Ⓓ no shift

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21. If the focal length of a concave mirror is 20 cm, then if the mirror is kept inside kerosene medium, its new focal length is  
(A) 10 cm                      (B) 15 cm                      (C) 20 cm                      (D) 25 cm
22. If object is placed at a distance of 40 cm from a concave mirror (of focal length 20 cm), then image distance from pole is  
(A) 20 cm                      (B) 30 cm                      (C) 40 cm                      (D) 60 cm
23. If incident rays are parallel to principal axis of a convex mirror ( $f = 20$  cm) and are coming from infinite distance, the image distance from pole of the convex mirror is  
(A) 40 cm                      (B) 10 cm                      (C) 30 cm                      (D) 20 cm
24. In case of shaving mirror (focal length = 20 cm), the object distance from pole will be  
(A)  $< 20$  cm                      (B)  $> 20$  cm                      (C) = 20 cm                      (D) none of these
25. The focal length of a concave mirror is 20 cm and object is placed 10cm in front of concave mirror from pole, then  $|\text{linear magnification}| =$   
(A) 1                              (B) 2                              (C) 2.5                              (D) 3

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**Chemistry**

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26. Calcium oxide (CaO) is also known as—  
(A) quick lime                      (B) slaked lime                      (C) milk of lime                      (D) lime water
27. The colour of ferrous sulphate crystals is  
(A) Blue                              (B) Yellow                              (C) Green                              (D) Brown
28. Reaction of iron nails with copper sulphate solution is an example of—  
(A) combination reaction                      (B) decomposition reaction  
(C) displacement reaction                      (D) double displacement reaction
29. A solution of sodium sulphate in water is—  
(A) sky blue in colour                      (B) pale green in colour  
(C) yellow in colour                      (D) colourless
30. Digestion is the example of—  
(A) displacement reaction                      (B) Combination reaction  
(C) neutralisation reaction                      (D) Decomposition reactions
31. When we add common salt in  $\text{AgNO}_3$  (silver nitrate) solution the precipitate formed will be—  
(A) black coloured                      (B) blue coloured                      (C) yellow coloured                      (D) white coloured

32. Chemical equation for the formation of hydrogen sulphide gas is  $ZnS + xHCl = ZnCl_2 + H_2S$ . What is the value of "x" in the equation, respectively?
- (A) 2                      (B) 1                      (C) 4                      (D) 3
33. CuO reacts with  $H_2$  gas the correct statement is —
- (A) CuO is reduced to Cu and  $H_2$  is oxidise to  $H_2O_2$   
 (B) CuO is reduced to Cu and  $H_2$  is oxidise to  $H_2O$   
 (C) CuO is oxidised to Cu and  $H_2$  is reduced to  $H_2O$   
 (D) None of CuO or  $H_2$  Suffer oxidation or reduction
34. When  $CO_2$  gas comes in contact with aqueous  $Ca(OH)_2$  then the correct product is
- (A) White coloured  $CaC_2$                       (B) White coloured  $CaCO_3$   
 (C) Yellow coloured  $CaC_2$                       (D) Yellow coloured  $CaCO_3$
35. Which of the following is the main constituent of natural gas that burns with oxygen gas readily ?
- (A)  $SO_2$                       (B)  $CH_4$                       (C)  $NO_2$                       (D)  $Cl_2$
36. What is true when vegetable matters turns into composts?
- (A) Heat is released                      (B) Heat is absorbed  
 (C) At first heat is released then absorbed                      (D) At first heat is absorbed then released
37. The correct products when lead nitrate is strongly heated?
- (A)  $PbNO_2 + NO_2 + O_2$                       (B)  $PbO_2 + N_2 + O_2$   
 (C)  $Pb + NO_2 + O_2$                       (D)  $PbO + NO_2 + O_2$
38. In cement industry, which of the following compound is widely used?
- (A)  $CaC_2$                       (B)  $CaO$                       (C)  $CaCl_2$                       (D)  $Ca(HCO_3)_2$
39. What happens when silver chloride is exposed to sunlight?
- (A) Black coloured silver is produced along with  $Cl_2$  gas  
 (B) Black coloured silver oxide is produced along with  $Cl_2$  gas  
 (C) Grey coloured silver oxide is produced along with  $Cl_2$  gas  
 (D) Grey coloured silver is produced along with  $Cl_2$  gas
40. Assertion - reason type question. Select the correct option
- OPTION A : Both assertion and reason is corrcet and reason is the correct explanation of assertion  
 OPTION B : Both assertion and reason is corrcet and reason is not the correct explanation of assertion  
 OPTION C : Assertion is correct statement but reason is wrong statement

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OPTION D : Assertion is wrong statement but reason is correct statement

Assertion : Magnesium ribbon burns in open air

Reason : Oxygen helps burning of any substance

41. Colour of NaCl solution is  
(A) yellow                      (B) colourless                      (C) red                      (D) green
42. When zinc reacts with dilute  $\text{H}_2\text{SO}_4$  then along with  $\text{ZnSO}_4$ , the correct product is  
(A)  $\text{H}_2\text{O}$                       (B)  $\text{O}_2$                       (C)  $\text{H}_2\text{O}_2$                       (D)  $\text{H}_2$
43. When Fe reacts with steam the correct statement is  
(A) Iron is oxidised by steam  
(B) Iron is reduced by steam  
(C) FeO is formed  
(D) liquid water is used for this reaction at room temperature
44. Which is an example of chemical change?  
(A) Rusting of iron                      (B) Condensation of water vapour  
(C) Melting of iron                      (D) Solubility of glucose in water
45. Consider the reaction  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$ . In this reaction  
(A) NaOH is oxidised and HCl is reduced  
(B) NaOH is reduced and HCl is oxidised  
(C) Both NaOH and HCl are oxidised  
(D) Neither NaOH nor HCl face oxidation or reduction
46. Respiration is considered as an exothermic reaction because  
(A) Mass of product decreases                      (B) Mass of product increases  
(C) Energy is absorbed                      (D) Energy is released
47. When quick lime reacts with water then calcium hydroxide is formed. It is an example of  
(A) Combination reaction                      (B) Displacement reaction  
(C) Double displacement reaction                      (D) Decomposition reaction
48. Which type of decomposition causes the formation of CaO and  $\text{CO}_2$  from  $\text{CaCO}_3$ ?  
(A) Electrolytic decomposition                      (B) Thermal decomposition  
(C) Photochemical decomposition                      (D) Aqueous decomposition

49. When barium chloride reacts with sodium sulphate then the colour of the precipitation is  
 (A) Brown (B) Yellow (C) Green (D) White
50. Electrolytic decomposition of water in presence of dilute acid produces  
 (A)  $\text{H}_2\text{O}_2 + \text{O}_2$  (B)  $\text{H}_2\text{O}_2 + \text{H}_2$  (C)  $\text{H}_2 + \text{O}_2$  (D)  $\text{H}_2\text{O}_2 + \text{H}_2 + \text{O}_2$

### Mathematics

51. If  $a = 2^3 \times 3$ ,  $b = 2 \times 3 \times 5$ ,  $c = 3^n \times 5$  and  $\text{LCM}(a, b, c) = 2^3 \times 3^2 \times 5$ , then  $n =$   
 (A) 4 (B) 3 (C) 1 (D) 2
52. The sum of exponents of the prime factors in the prime factorization of 196, is—  
 (A) 2 (B) 4 (C) 6 (D) 1
53. The exponent of 2 in the prime factorization of 144, is—  
 (A) 5 (B) 6 (C) 3 (D) 4
54. The LCM of two numbers is 1200. Which of the following cannot be their HCF?  
 (A) 600 (B) 400 (C) 500 (D) 200
55. If  $(x + a)$  is a factor of  $2x^2 + 2ax + 5x + 10$ , then the value of  $a$  is—  
 (A) 3 (B) 2 (C) 0 (D) 1
56. For what value of  $k$ ,  $-4$  is a zero of the polynomial  $x^2 - x - (2k + 2)$ ?  
 (A) 4 (B) 5 (C) 9 (D) 8
57. If one root of the polynomial  $f(x) = 5x^2 + 13x + k$  is reciprocal of the other, then the value of  $k$  is  
 (A) 0 (B) 5 (C)  $\frac{1}{6}$  (D) 6
58. The product of the additive inverse and multiplicative inverse of 6 is :  
 (A) -6 (B) 1 (C) -1 (D)  $\frac{1}{6}$
59. Which of the following alternatives is wrong? Given that :  
 (i) Difference of two rational numbers is a rational number.  
 (ii) Subtraction is commutative on rational numbers.  
 (iii) Addition is not commutative on rational numbers.  
 (A) (ii) & (iii) (B) (i) only (C) (i) & (iii) (D) All the above



60. The HCF of any two prime numbers  $a$  and  $b$  is  
 (A)  $a$  (B)  $ab$  (C)  $b$  (D) 1
61. Which of the following rational numbers have terminating decimal expansion?  
 (A)  $64/455$  (B)  $29/343$  (C)  $13/625$  (D)  $1/308$
62. Quadratic polynomial having zeros 1 and  $-2$  is  
 (A)  $x^2 - x + 2$  (B)  $x^2 - x - 2$  (C)  $x^2 + x - 2$  (D) None of these
63. If  $(x - 1)$  is a factor of  $kx^3 - 4kx^2 + 4kx - 1$ , then the value of  $k$  is  
 (A) 1 (B)  $-1$  (C) 2 (D)  $-2$
64. Quadratic polynomial having sum of its zeros 5 and product of its zeros  $-14$  is  
 (A)  $x^2 - 5x - 14$  (B)  $x^2 - 10x - 14$  (C)  $x^2 - 5x + 14$  (D) None of these
65.  $\alpha$  and  $\beta$  are the zeros of the polynomial  $f(x) = 6x^2 - 3 - 7x$  then  $(\alpha + 1)(\beta + 1)$  is equal to -  
 (A)  $\frac{5}{2}$  (B)  $\frac{5}{3}$  (C)  $\frac{2}{5}$  (D)  $\frac{3}{5}$
66. The traffic lights at three different signals change after 48 seconds, 72 seconds and 108 seconds. If they change at 7 a.m. simultaneously. How many times they will change between 7 a.m. to 7.30 a.m. simultaneously?  
 (A) 3 (B) 4 (C) 5 (D) 2
67. The G.C.D of  $(2002, k) = 4$ , then the value of  $k$  is  
 (A) All even values (B) 4 only  
 (C) All odd values (D) For all values of  $k$ , it is not possible
68. The largest number which divides 62, 132 and 237 and leaves the same remainder in each case is  
 (A) 34 (B) 33 (C) 35 (D) 36
69. The least perfect square number which is divisible by 8, 15, 20, 22 is  
 (A) 435600 (B) 43560 (C) 39600 (D) 465660
70. The ratio of two numbers is 3 : 4 and their HCF is 4. Then LCM is  
 (A) 12 (B) 16 (C) 24 (D) 48
71. Let  $p(x) = ax^2 + bx + c$  be a quadratic polynomial. It can have at most  
 (A) One zero (B) Two zeros (C) Three zeros (D) None of these
72. The number of zeroes that polynomial  $f(x) = (x - 2)^2 + 4$  can have is  
 (A) 1 (B) 2 (C) 0 (D) 3

73. Zeroes of a polynomial can be determined graphically. No. of zeroes of a polynomial is equal to no. of points where the graph of polynomial
- (A) intersects  $y$ -axis (B) intersects  $x$ -axis  
 (C) intersects  $y$ -axis or intersects  $x$ -axis (D) none of these
74. If  $p(x) = ax^2 + bx + c$ , then  $-\frac{b}{a}$  is equal to
- (A) 0 (B) 1  
 (C) product of zeroes (D) sum of zeroes
75. If  $p(x) = ax^2 + bx + c$  and  $a + c = b$ , then one of the zeroes is
- (A)  $\frac{b}{a}$  (B)  $\frac{c}{a}$  (C)  $\frac{-c}{a}$  (D)  $\frac{-b}{a}$

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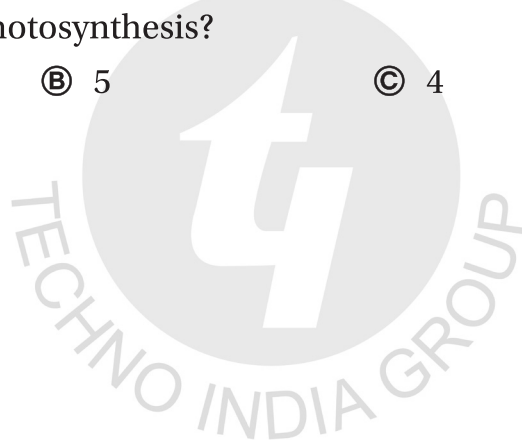
**Biology**


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76. Photolysis of water takes place in—
- (A) Sunlight (B) At night  
 (C) Both in sunlight and at night (D) None
77. Reduced form of NADP is—
- (A) NADPH (B)  $\text{NADP}_2$  (C)  $\text{NADPH}_2$  (D) All
78. Glucose is a \_\_\_\_\_ compound
- (A) 5C (B) 4C (C) 6C (D) 7C
79. Number of milk teeth in humans are—
- (A) 32 (B) 20 (C) 30 (D) 22
80. Stomach is—
- (A) S shaped (B) C shaped (C) D shaped (D) J shaped
81. Trypsin helps in digestion of—
- (A) Fat (B) Protein (C) Starch (D) All
82. Egestion is—
- (A) Removal of nitrogenous wastes (B) Removal of toxic wastes  
 (C) Removal of undigested food (D) Removal of water
83. Gastric juice is—
- (A) Acidic (B) Alkaline (C) Neutral (D) Slightly alkaline

84. The end products of fat digestion is/are—  
 (A) Glucose (B) Fatty acids and Glycerol  
 (C) Amino acids (D) Alkaloids
85. Saliva converts—  
 (A) Proteins into amino acids (B) Glycogen into glucose  
 (C) Starch into maltose (D) Fats into vitamins
86. The energy change in photosynthesis is from—  
 (A) Light energy to electrical energy (B) Chemical energy to light energy  
 (C) Light energy to chemical energy (D) Chemical energy to electrical energy
87. Organisms feeding on dead and decaying matter are called—  
 (A) Parasites (B) Herbivores (C) Saprotrophs (D) Insectivores
88. Full form of NADP is—  
 (A) Nicotinamide Dinucleotide Phosphate  
 (B) Nicotine Adenine Dinucleotide Phosphate  
 (C) Nicotinamide Adenine Dinucleotide Phosphate  
 (D) None of the above
89. Digestion of food in humans starts from—  
 (A) Duodenum (B) Small intestine (C) Buccal cavity (D) Large intestine
90. Which of the following has no digestive enzyme?  
 (A) Saliva (B) Bile (C) Gastric juice (D) Intestinal juice
91. Which of the following nutrients is the main source of energy for our body?  
 (A) Carbohydrates (B) Proteins (C) Fats (D) Vitamins
92. Which nutrient is required in small amounts, but is essential for various metabolic processes in the body?  
 (A) Carbohydrates (B) Proteins (C) Fats (D) Vitamins
93. Name the organ that stores bile.  
 (A) Liver (B) Gall bladder (C) Stomach (D) Large intestine
94. Which one of the following leaves can be used in experiments to prove the importance of chlorophyll in photosynthesis?  
 (A) Banyan (B) Mango (C) Neem (D) Croton

95. The indicator used to test the presence of starch in leaves is—  
Ⓐ Eosin                      Ⓑ Methylene blue    Ⓒ Safranin                      Ⓓ Iodine
96. Those organisms who depend on other living organisms for food are—  
Ⓐ Autotrophs              Ⓑ Saprotrophs              Ⓒ Parasites                      Ⓓ Holozoic feeders
97. Villi in the small intestine help to increase the surface area for \_\_\_\_\_ of food.  
Ⓐ Ingestion              Ⓑ Digestion                      Ⓒ Absorption                      Ⓓ Assimilation
98. *Amoeba* shows \_\_\_\_\_ nutrition.  
Ⓐ Saprotrophic              Ⓑ Parasitic                      Ⓒ Autotrophic                      Ⓓ Holozoic
99. The end product of protein digestion is—  
Ⓐ Glucose                      Ⓑ Fatty acids                      Ⓒ Glycerol                      Ⓓ Amino acids
100. How many molecules of carbon dioxide are utilised to produce one molecule of glucose, during photosynthesis?  
Ⓐ 6                              Ⓑ 5                              Ⓒ 4                              Ⓓ 3



**Space For Rough Works**



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