



Monthly Progressive Test

Class: XI

Subject: PCMB



Test Booklet No.: MPT01

Test Date:

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Time: 180 mins

Full Marks: 200

Important Instructions :

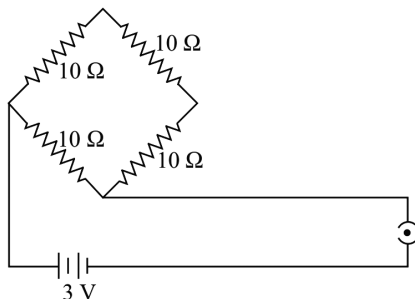
1. The Test is of 180 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 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. The current drawn from the battery by network of four resistors shown in the figure above



- (A) 0.3A (B) 0.4A (C) 0.5A (D) 0.6A
2. What will be the length of the nichrome wire of resistance 5.0 ohm, if the length of similar wire of 120 cm has resistance of 2.5 ohm?
- (A) 120cm (B) 240 cm (C) 200 cm (D) 480 cm
3. In parallel combination of resistors, potential difference across each resistor is
- (A) different (B) sometimes different
(C) same (D) insufficient data
4. Two resistors of resistance 2 ohm and 4 ohm when connected to a battery will have
- (A) same current flowing through them when connected in parallel
(B) same current flowing through them when connected in series
(C) same potential difference across them when connected in series
(D) different potential difference across them when connected in parallel
5. An electric heater is rated 100W and 220V. If it is operated on 110V, the power consumption will be
- (A) 10W (B) 25W (C) 15W (D) 100W
6. To determine the approximate focal length of the given convex lens by focusing a distant object (say, a tree), we try to focus the image of the object on a screen. The characteristic/s of the image
- (A) real image (B) inverted image
(C) diminished (D) all of these are correct
7. When parallel rays of light fall on a concave mirror along its principal axis, after reflection

[2]

from the concave mirror, meet at a point in front of the mirror. This point is called

- (A) centre of curvature
- (B) focal point of the mirror
- (C) optical point
- (D) Pole of mirror

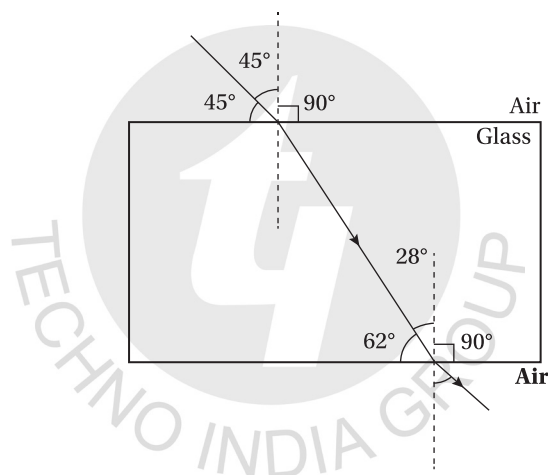
8. A ray of light passing through the optical centre of convex lens passes

- (A) with deviation
- (B) some times with deviation
- (C) without deviation
- (D) through focus

9. If the focal length of a concave mirror is 20cm then the magnitude of its radius of curvature is

- (A) 30cm
- (B) 25cm
- (C) 10cm
- (D) 40cm

10. A ray of light is incident on a glass slab as shown in the figure below. The angle of refraction inside glass slab (when refraction takes place from air to glass) is



- (A) 62°
- (B) 45°
- (C) 28°
- (D) 30°

11. SI unit of frequency of sound is

- (A) hertz
- (B) newton
- (C) maxwell
- (D) faraday

12. Speed of sound = (frequency/wavelength), the relation is

- (A) True
- (B) false
- (C) may be true
- (D) none of these

13. If the speed of sound in air is 330m/s and frequency of sound be 100Hz, then wavelength is equal to

- (A) 6.4m
- (B) 1.6m
- (C) 3.3m
- (D) 3m

14. Speed of sound in free space (vacuum) is

- (A) 330m/s
- (B) 1500m/s
- (C) 500m/s
- (D) 0m/s as sound can not pass through free space

[3]

15. Range of frequency of audible sound is
- (A) 0Hz to 20Hz (B) 20Hz to 20kHz
(C) > 20kHz (D) 0Hz to 10 Hz
16. The time required to cover a distance of 30m along a straight line with initial and final velocity as 1m/s and 5m/s respectively
- (A) 5s (B) 15s (C) 10s (D) 20s
17. A particle starts from rest and attains a velocity 10m/s in 5s, then displacement of the particle is equal to (consider rectilinear motion of uniform acceleration)
- (A) 10m (B) 15m (C) 20m (D) 25m
18. Starting from rest, a particle attains a velocity 10m/s in the time interval of 5s. The particle is moving along a straight line with uniform acceleration. Then acceleration of the particle is
- (A) 1m/s^2 (B) 2m/s^2 (C) 3m/s^2 (D) 4m/s^2
19. Starting from rest, a particle moves along a straight line with uniform acceleration of 3m/s^2 in the time interval of 2s. Then displacement of the particle during this period is
- (A) 2m (B) 4m (C) 6m (D) 5m
20. A particle travels first half of the distance (in m) with velocity $u\text{ m/s}$ and remaining half of the distance with velocity $v\text{ m/s}$. Then the average speed during the period is
- (A) $uv/(u+v)$ (B) $2uv/(u+v)$ (C) $(u+v)/2$ (D) $\sqrt{(u.v)}$
21. The magnetic field lines inside the solenoid are in the form of straight lines, which indicates that the magnetic field is
- (A) uniform (B) non uniform
(C) absent (D) some times uniform
22. If we place soft iron inside the strong magnetic field produced inside the solenoid, then soft iron
- (A) will not be magnetized (B) will be magnetized
(C) sometimes will be magnetized (D) we cannot say as data is insufficient
23. The pattern of the magnetic field associated with a current carrying solenoid and pattern of the magnetic field around a bar magnet, are
- (A) different (B) some times different
(C) similar (D) some times similar

24. The N and S poles exchange position when the direction of current through the solenoid is reversed
 (A) false (B) sometimes false (C) true (D) sometimes true
25. The magnetic field lines around a straight current carrying conductor are
 (A) concentric squares (B) concentric hexagons
 (C) concentric triangles (D) concentric circles

Chemistry

26. Which of the following is an aldehyde functional group?
 (A) $-\text{COOH}$ (B) $-\text{CHO}$ (C) $-\text{OH}$ (D) $-\text{COCl}$
27. Which of the following is not a crystalline allotrope of carbon?
 (A) Diamond (B) Graphite (C) Fullerene (D) Gas carbon
28. Decarboxylation reaction is associated with which functional group?
 (A) Alcohol (B) Aldehyde (C) Carboxylic acid (D) Ketone
29. Which of the following hydrocarbon contains carbon - carbon double bond?
 (A) Methane (B) Ethane (C) Ethene (D) Ethyne
30. What is the correct formula of isopropyl alkyl group?
 (A) $\text{CH}_3\text{CH}_2\text{CH}_2-$ (B) $(\text{CH}_3)_3\text{C}-$ (C) $(\text{C}_2\text{H}_5)_2\text{CH}-$ (D) $(\text{CH}_3)_2\text{CH}-$
31. What is the SI unit of charge?
 (A) e.s.u (B) Joule (C) Coulomb (D) Watt
32. When $\text{Pb}(\text{NO}_3)_2$ is strongly heated then lead oxide, NO_2 , O_2 is formed. This is an example of
 (A) Decomposition reaction (B) Displacement reaction
 (C) Double displacement reaction (D) No option is correct
33. NaCl reacts with AgNO_3 . It is an example of
 (A) Decomposition reaction (B) Displacement reaction
 (C) Double displacement reaction (D) No option is correct
34. Which is true about endothermic reaction?
 (A) Heat is always released (B) Heat is always absorbed
 (C) Heat is released at first then absorbed (D) Heat is absorbed at first then released

[5]

35. Which is the correct unit of pressure?
Ⓐ N.m^2 Ⓑ N.m^3 Ⓒ N.m^{-3} Ⓓ N.m^{-2}
36. What is the correct product when zinc reacts with dilute H_2SO_4 at normal temperature?
Ⓐ $\text{ZnSO}_4 + \text{SO}_2 + \text{H}_2\text{O}$ Ⓑ $\text{ZnO} + \text{SO}_2 + \text{H}_2\text{O}$
Ⓒ $\text{ZnSO}_4 + \text{H}_2$ Ⓓ $\text{ZnO} + \text{SO}_2 + \text{H}_2$
37. When methane reacts with excess oxygen gas then the correct product will be
Ⓐ $\text{CO} + \text{H}_2\text{O}$ Ⓑ $\text{CO}_2 + \text{H}_2\text{O}$ Ⓒ $\text{C} + \text{H}_2\text{O}$ Ⓓ $\text{C} + \text{CO}_2 + \text{H}_2\text{O}$
38. Which pair is homologous to each other?
Ⓐ Ethane and ethene Ⓑ Ethene and ethyne
Ⓒ Methane and ethene Ⓓ Methane and ethane
39. Which is an acid salt?
Ⓐ Na_2SO_4 Ⓑ KNO_3 Ⓒ NaHCO_3 Ⓓ NH_4Cl
40. Which is not an oxyacid?
Ⓐ Nitric acid Ⓑ Phosphoric acid Ⓒ Sulphuric acid Ⓓ Hydrochloric acid
41. Dibasic acid means
Ⓐ An acid that can increase its acidity by increasing temperature
Ⓑ An acid that is highly soluble in water
Ⓒ An acid that can release two H^+ ions
Ⓓ An acid that can release one H^+ ion
42. Among the given compounds which is a weak base?
Ⓐ NaOH Ⓑ KOH Ⓒ $\text{Ca}(\text{OH})_2$ Ⓓ NH_4OH
43. Which is present in Milk of magnesia, an antacid?
Ⓐ MgSO_4 Ⓑ MgO Ⓒ $\text{Mg}(\text{OH})_2$ Ⓓ MgCl_2
44. What is the molecular formula of Plaster of Paris?
Ⓐ CaSO_4 Ⓑ $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ Ⓒ $\text{CaSO}_4 \cdot 4\text{H}_2\text{O}$ Ⓓ $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$
45. Acid rain is caused by which gas ?
Ⓐ CH_4 Ⓑ SO_2 Ⓒ O_2 Ⓓ N_2
46. 0.112 L O_2 gas at STP is equivalent to ($\text{O} = 16$) which of the following?
Ⓐ 0.016 gm Ⓑ 0.16 gm Ⓒ 0.032 gm Ⓓ 0.32 gm

47. If Avogadro number is 6.02×10^{23} then what is the number of molecules present in 6.4 gm oxygen [O = 16]?
- (A) 12.04×10^{21} (B) 12.04×10^{22} (C) 3.01×10^{22} (D) 18.06×10^{22}
48. What is the number of moles of 0.448 L N_2 gas at STP?
- (A) 0.2 mole (B) 0.002 mole (C) 0.1 mole (D) 0.02 mole
49. Among the given molecules which is a monobasic acid?
- (A) H_2SO_4 (B) H_3PO_4 (C) H_3PO_3 (D) H_3PO_2
50. What is the mass of 0.03 mole H_2SO_4 [H = 1, S = 32, O = 16] ?
- (A) 1.47 gm (B) 2.94 gm (C) 0.147 gm (D) 0.294 gm

Mathematics

51. An irrational number between 2 and 2.5 is
- (A) $\sqrt{11}$ (B) $\sqrt{5}$ (C) $\sqrt{22.5}$ (D) $\sqrt{12.5}$
52. The value of $\sqrt{3-2\sqrt{2}}$ is
- (A) $\sqrt{2}-1$ (B) $\sqrt{2}+1$ (C) $\sqrt{3}-\sqrt{2}$ (D) $\sqrt{2}+\sqrt{2}$
53. If $x = 7 + 4\sqrt{3}$ and $xy = 1$, then $\frac{1}{x^2} + \frac{1}{y^2}$
- (A) 64 (B) 134 (C) 194 (D) 1/49
54. If $2^x = 3^y = 6^{-z}$, then $\frac{1}{x} + \frac{1}{y} + \frac{1}{z}$ is equal to
- (A) 2 (B) 3 (C) 1 (D) 0
55. $\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}}$ is equal to
- (A) $x^{2(a-b)}$ (B) 1 (C) x^{a-b} (D) x^{b-a}
56. If $p(x) = x^2 - 2\sqrt{2}x + 1$, then $p(2\sqrt{2})$
- (A) 0 (B) 1 (C) $4\sqrt{2}$ (D) $8\sqrt{2} + 1$
57. If one factor of the expression $x^3 + 7kx^2 - 4kx + 12$ is $(x + 3)$, then the value of k is
- (A) 5 (B) $\frac{1}{5}$ (C) $-\frac{13}{17}$ (D) $-\frac{17}{13}$
58. If n is any natural number, then $6^n - 5^n$ always ends with
- (A) 3 (B) 5 (C) 7 (D) 1

59. 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
60. Zero of $p(x) = x^2 - 2x - 3$ is:
 (A) 0 (B) 1 (C) -1 (D) -3
61. Quadratic polynomial having zeroes 1 and -2 is:
 (A) $x^2 - x + 2$ (B) $x^2 - x - 2$ (C) $x^2 + x - 2$ (D) $x^2 + x + 2$
62. If α and β are the zeros of the polynomial $f(x) = x^2 - 5x + K$ such that $\alpha - \beta = 1$, then find the value of K .
 (A) 5 (B) 6 (C) 7 (D) 2
63. Graph drawn from the equation $y = x^2 - 3x - 4$ will be:
 (A) Circle (B) Parabola (C) Straight Line (D) Hyperbola
64. For what value of k , do the equations $3x - y + 8 = 0$ and $6x - ky + 16 = 0$ represent coincident lines?
 (A) $\frac{1}{2}$ (B) $-\frac{1}{2}$ (C) 2 (D) -2
65. The value of k for which the system of equations $x + 2y = 5$, $3x + ky + 15 = 0$ has no solution is
 (A) 6 (B) -6 (C) $\frac{3}{2}$ (D) None of these
66. Find the nature of solution of the system of linear equations given by $3x + 4y = 5$ and $4x - 6y = 8$
 (A) unique solution (B) no solution
 (C) infinitely many solutions (D) inadequate data
67. The value of $x + y$ in the solution of equations $\frac{x}{4} + \frac{y}{3} = \frac{5}{12}$ and $\frac{x}{2} + y = 1$ is
 (A) $\frac{1}{2}$ (B) $\frac{3}{2}$ (C) 2 (D) $\frac{5}{2}$
68. The values of k for which the equation $16x^2 + 4kx + 9 = 0$ has real and equal roots are
 (A) 6, $-\frac{1}{6}$ (B) 36, -36 (C) 6, -6 (D) $\frac{3}{4}$, $-\frac{3}{4}$
69. If one root of the equation $4x^2 - 2x + (\lambda - 4) = 0$ be the reciprocal of the other then $\lambda =$
 (A) 8 (B) -8 (C) 4 (D) -4
70. If the sum of the roots of the equation $x^2 - (k + 6)x + 2(2k - 1) = 0$ is equal to half of their product, then $k =$
 (A) 6 (B) 7 (C) 5 (D) 1

71. If 2 is a root of the equation $x^2 - ax + 12 = 0$ and the equation $x^2 + ax + q = 0$ has equal roots, then $q =$
- (A) 12 (B) 8 (C) 20 (D) 16
72. If the equation $x^2 + 4x + k = 0$ has real and distinct roots, then
- (A) $k < 4$ (B) $k > 4$ (C) $k \geq 4$ (D) $k \leq 4$
73. If $ax^2 + bx + c = 0$ has equal roots, then $c =$
- (A) $\frac{-b}{2a}$ (B) $\frac{b}{2a}$ (C) $\frac{-b^2}{4a}$ (D) $\frac{b^2}{4a}$
74. Roots of the quadratic equation $x^2 - 5x - 6 = 0$ are
- (A) equal but negative (B) unequal but of same signs
(C) unequal but of opposite signs (D) equal but positive
75. The quadratic equation where one root is $3 + 2\sqrt{3}$ is
- (A) $x^2 - 6x - 3 = 0$ (B) $x^2 + 6x - 3 = 0$ (C) $x^2 + 6x + 3 = 0$ (D) $x^2 - 6x + 3 = 0$

Biology

76. Cell is the Latin word for—
- (A) The big rectangle (B) A little room (C) A beehive (D) Cork tissue
77. The components of a cell, which enable it show division of labour, are _____
- (A) cytoplasm (B) organelles (C) nucleus (D) cell membrane
78. Which of the following organisms show a 'nucleoid' in their cells?
- (A) Bacteria (B) Fungi (C) Plants (D) Animals
79. _____ are the 'powerhouses' of the cell.
- (A) Nucleus (B) Plastids (C) Mitochondria (D) Vacuoles
80. When a cell gains water by endosmosis, then the solution surrounding it is _____
- (A) Hypotonic (B) Hypertonic (C) Isotonic (D) None of the above
81. The lateral meristem helps in—
- (A) increasing the length of roots (B) growth of buds
(C) increasing the width of stem (D) growth of root hair
82. Chlorenchyma is a type of—
- (A) Meristematic tissue (B) Parenchyma
(C) Collenchyma (D) Sclerenchyma

83. How many elements make up the phloem tissue?
Ⓐ One Ⓑ Four Ⓒ Eight Ⓓ Sixteen
84. The type of epithelial tissue found in the lining of kidney tubules are—
Ⓐ Squamous epithelium Ⓑ Columnar epithelium
Ⓒ Cuboidal epithelium Ⓓ Stratified squamous epithelium
85. Cylindrical, branched and uninucleate cells are found in the _____ muscles.
Ⓐ Skeletal Ⓑ Smooth Ⓒ Cardiac Ⓓ All
86. Choose the correct statement about photosynthesis—
Ⓐ Carbon dioxide is reduced to carbohydrate.
Ⓑ Carbon dioxide is oxidised to carbohydrate.
Ⓒ Glucose is produced as a byproduct.
Ⓓ Chlorophyll helps to take in carbon dioxide from air.
87. The process of digestion begins in the—
Ⓐ Stomach Ⓑ Small intestine
Ⓒ Oesophagus Ⓓ Buccal cavity
88. Ticks, lice and tapeworm are—
Ⓐ Saprophytes Ⓑ Herbivores
Ⓒ Scavengers Ⓓ Parasites
89. Complete the equation, choosing the right option—
Glucose + Oxygen \longrightarrow _____ + _____ + Energy
Ⓐ Carbon dioxide and water Ⓑ Carbon dioxide and ethanol
Ⓒ Carbon dioxide and lactic acid Ⓓ Ethanol and lactic acid
90. Choose the incorrect statement—
Ⓐ The nasal passage is lined with hair and mucus which help to clean air.
Ⓑ The lungs are present over a sheet of muscle, called diaphragm.
Ⓒ The trachea is surrounded by incomplete rings of ligament.
Ⓓ Alveoli are the actual sites for the exchange of respiratory gases between the organism and its environment.
91. The two vena cavae bring deoxygenated blood to the _____ of the heart.
Ⓐ Right atrium Ⓑ Left atrium Ⓒ Right ventricle Ⓓ Left ventricle

92. Sieve tubes of phloem help in—
Ⓐ Transportation of only water.
Ⓑ Translocation of food only in the upward direction.
Ⓒ Translocation of food both in upward and downward directions.
Ⓓ Ascent of sap.
93. Plants get rid of excess water by the process of—
Ⓐ Osmosis Ⓑ Transpiration Ⓒ Storage as resins Ⓓ Photosynthesis
94. Name the organ in which urine is temporarily stored before being released outside—
Ⓐ Kidney Ⓑ Liver Ⓒ Urinary bladder Ⓓ Urethra
95. The only digestive juice which contains no enzyme is—
Ⓐ Saliva Ⓑ Gastric juice Ⓒ Pancreatic juice Ⓓ Bile
96. Name the structure of the male reproductive system which lies outside the abdominal cavity—
Ⓐ Testis Ⓑ Vas deferens Ⓒ Seminal vesicle Ⓓ All
97. The site of fertilisation in humans is—
Ⓐ Ovary Ⓑ Fallopian tube Ⓒ Uterus Ⓓ Vagina
98. The embryo gets nutrition from the mother's blood with the help of—
Ⓐ Umbilical cord Ⓑ Ovary Ⓒ Placenta Ⓓ Uterus
99. The narrow passage connecting the uterus and vagina in the female reproductive system is—
Ⓐ Fallopian tube Ⓑ Urethra Ⓒ Cervix Ⓓ Ovary
100. Menstruation happens when—
Ⓐ the egg is fertilised Ⓑ the egg is not fertilised
Ⓒ the process of implantation occurs Ⓓ the girl is yet to attain puberty

Space For Rough Works



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