
Pavzi Media

AP Polycet - 2016

English Medium

Model Paper for Math's, Physics and Chemistry

Pavzi

1. The HCF of a^2b^3c and ab^2c , where a, b and c are prime numbers, is

1. $a^2b^3c^2$
2. $a^2b^2c^2$
3. ab^2c
4. a^2b^3c

2. If $x^2+y^2=6xy$, then $2 \log(x+y) =$

1. $\log x + \log y + 3 \log 2$
2. $\log x + \log y + 2 \log 3$
3. $\log x + \log y + \log 2$
4. $\log x + \log y + 6 \log 2$

3. The relation of $a+(b+c)=(a+b)+c$ is

1. commutative law
2. associative law
3. distributive law
4. None

4. 0.1010010001 000.....1 is

1. a rational
2. an irrational
3. an integer
4. None

5. If n is a natural number, then $9^{2n} - 4^{2n}$ is always divisible by

1. 5
2. 15
3. 25
4. None

6. If $A = \{x/x \in \mathbb{N}, 2 \leq x \leq 7\}$, then $A =$

1. {1,3,4}
2. {2,3,4,5,6}
3. {2,3,4,5,6,7}
4. {3,4,5}

7. If $A = \{\text{Prime numbers less than } 20\}$, $B = \{\text{Whole numbers less than } 10\}$, then $(A-B) \cap (B-A) =$

1. Φ
2. μ
3. A
4. B

8. If two zeroes of the polynomial x^3+x^2-9x-9 are -3 and 3, then its third zero is

1. -1
2. 1
3. -9
4. 9

9. If one root of the polynomial $f(x) = 5x^2 + 13x + k$ is reciprocal of the other, then the value of k is

1. 0
2. 5
3. 1/6
4. 6

10. The value of x which satisfies the equation $2x - (4-x) = 5 - x$ is

1. 4.5
2. 3
3. 2.25
4. 0.5

11. The value of k for which the system of equations $3x+y=1$ and $(2k-1)x+(k-1)y=2k+1$ is inconsistent, is

1. 1
2. 0
3. -1
4. 2

12. If a pair of linear equations in two variables is consistent, then the lines represented by the two equations are

1. Intersecting
2. parallel
3. intersecting or coincident
4. always coincident

13. If twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Then the age of the son is

1. 13
2. 20
3. 15
4. 14

14. Solve: $99x+101y=499$, $101x+99y=501$

1. (-3,-2)
2. (8,9)
3. (1,4)
4. (3,2)

15. The product of the roots of $\sqrt{3}x^2 - 6x + 9\sqrt{3} = 0$ is

1. $\sqrt{3}$
2. 9
3. -3
4. None

16. If the roots of a quadratic equation are p/q and q/p , then the equation is

1. $qx^2 - (q^2+p^2)x - pq = 0$
2. $pqx^2 - (p^2+q^2)x + pq = 0$
3. $px^2 - (p^2+1)x + p = 0$
4. $p^2x^2 - (p^2-q^2)x - pq = 0$

17. The discriminant of $\sqrt{x^2+x+1} = 2$ is

1. 13
2. -3
3. 11
4. None

18. If p,q,r,s,t,u, and v are in AP, then $q+r+s+t+u =$

1. $5/2(p+v)$
2. $2/5(v-p)$
3. $5/2p$
4. None

19. The sum of all natural numbers between 100 and 1000 which are multiples of 5 is

1. 98450
2. 99450
3. 16450
4. 94450

20. If a, b, c are in AP and GP both, then which of the following is correct?

1. $a = b = c$
2. $a \neq b = c$
3. $a = b = c$
4. $a \neq b \neq c$

21. The sum of all odd integers between 2 and 100 those are divisible by 3 is

1. 767
2. 467
3. 567
4. 867

22. The distance between the points $(a \cos \theta + b \sin \theta, 0)$ and $(0, a \sin \theta - b \cos \theta)$ is

1. $a^2 + b^2$
2. $a + b$
3. $\sqrt{a^2 - b^2}$
4. $\sqrt{a^2 + b^2}$

23. A triangle formed by the points $A(a, 0)$, $B(-a, 0)$ and $C(0, a\sqrt{3})$ is

1. A right-angled triangle
2. An isosceles triangle
3. An equilateral triangle
4. A scalene triangle

24. The area of the quadrilateral whose vertices taken in order are $(-4, -2)$, $(-3, -5)$, $(-3, -2)$ and $(2, 3)$ is sq. units

1. 56
2. 28
3. 84
4. None

25. If the points $A(x, -1)$, $B(2, 1)$ and $C(4, 5)$ are collinear, then $x =$

1. 1
2. -1
3. 0
4. 2

26. The perimeter of the triangle formed by the points $(-a, 0)$, $(a, 0)$ and $(0, a)$ is

1. $2a(1 + \sqrt{2})$
2. $a(2 + \sqrt{2})$
3. $2a(a + \sqrt{2})$
4. None

27. If a line makes 60° with positive x-axis, then its slope is

1. $1/\sqrt{3}$
2. 1
3. $\sqrt{3}$
4. $-\sqrt{3}$

28. In a right-angled triangle ABC right-angled at B, if P and Q are points on the sides AB and BC respectively, then

1. $AQ^2 + CP^2 = 2(AC^2 + PQ^2)$
2. $2(AQ^2 + CP^2) = AC^2 + PQ^2$
3. $AQ^2 + CP^2 = AC^2 + PQ^2$
4. None

29. A man goes 24 m due west and then 7 m due north. How far is he from the starting point?

1. 31 m
2. 25 m
3. 26 m
4. 17 m

30. The parallelogram circumscribing a circle is a

1. Trapezium
2. Square
3. Rhombus
4. Rectangle

31. The curved surface area of a right circular cone of radius 11.3 cm is 355 cm^2 . What is its slant height? (Take $\pi = 355/113$)

1. 8 cm
2. 9 cm
3. 10 cm
4. 11 cm

32. Three solid spheres of gold whose radii are 1 cm, 6 cm and 8 cm respectively are melted into a single sphere. Then the radius of the sphere is

1. 7 cm
2. 8 cm
3. 9 cm
4. 10 cm

33. A hemisphere of outer and inner radii 10 cm and 6 cm respectively is moulded as a cylinder of diameter 14 cm. Then the height of the cylinder = cm.

1. 1.4
2. 1.33
3. 2.3
4. None

34. If $x = a \sin \theta$ and $y = b \cos \theta$, then $b^2 x^2 + a^2 y^2 =$

1. 1

2. $a^2 + b^2$
 3. $a^2 - b^2$
4. $a^2 b^2$

35. $\cot \theta + \tan \theta =$

- 1. $\sec \theta \operatorname{cosec} \theta$**
 2. $\sec^2 \theta$
 3. $\cos \theta \sin \theta$
 4. None

36. The value of $\cos 1^\circ \cdot \cos 2^\circ \cdot \cos 3^\circ \cdot \cos 4^\circ \dots \dots \dots \cos 180^\circ$ is

1. 1
2. 0
 3. -1
 4. $1/2$

37. $\sec^4 A - \sec^2 A =$

1. $\tan^2 A - \tan^4 A$
 2. $\tan^4 A - \tan^2 A$
3. $\tan^4 A + \tan^2 A$
 4. None

38. $\tan 48^\circ \cdot \tan 16^\circ \cdot \tan 42^\circ \cdot \tan 74^\circ =$

1. $1/\sqrt{3}$
 2. $\sqrt{3}$
 3. 0
4. 1

39. If a 1.5 m tall girl stands at a distance of 3 m from a lamp post and casts a shadow of length 4.5 m on the ground, then the height of the lamp post is

1. 1.5 m
2. 2.5 m
 3. 2 m
 4. 2.8 m

40. From the letters of the word 'MOBILE', a letter is selected. The probability that the letter is a vowel is

1. $1/3$
 2. $3/7$
 3. $1/6$
4. $1/2$

41. Which of the following cannot be the probability of an event?

1. $2/3$
 2. 15%
3. -1.5
 4. 0.7

42. A month is selected at random in a year. The probability that it is March or October is?

1. $1/12$
2. $1/6$

3. $3/4$
 4. None

43. A number x is chosen at random from the numbers -3, -2, -1, 0, 1, 2, 3. The probability that $x < 2$ is

1. $5/7$
 2. $2/7$
3. $3/7$
 4. $1/7$

44. The medium of the marks scored by 50 students in a 50 marks' test is

Marks	1-10	11-20	21-30	31-40	41-50
No. of students	3	12	16	14	5

1. 25.75
2. 26.75
 3. 27.75
 4. None

45. The mean of n observations is x . If the first term is increased by 1, second by 2, third by 3 and so on, then the new mean is

1. $x + n$
 2. $x + n/2$
3. $x + (n+1)/2$
 4. $x + (n-1)/2$

46. The median of the scores 6, 49, 14, 46, 16, 42, 26, 32, 28 is

1. 30
 2. 32
 3. 31
4. None

47. The observations of some data are $x/5, x, x/4, x/2$ and $x/3$, when $x > 0$. If the median of the data is 8, then the value of x is

- 1. 24**
 2. $8/3$
 3. $3/8$
 4. 8

48. Mode is

1. Least frequent value
 2. Middle most value
3. Most frequent value
 4. None

49. The SI unit of specific heat is

1. J/K
 2. J/Kg
 3. $J-Kg/K$

4. j/kg-k

50. The change of phase from liquid to gas that occurs at the surface of a liquid is called

1. Melting
2. Freezing
3. Condensation

4. **Evaporation**

51. The final temperature of a mixture of 100g of water at 30°C temperature and 100g of water at 60°C temperature is

1. 45°C
2. 70°C
3. 90°C
4. 130°C

52. The distance between the pole and the centre of curvature of a concave mirror is called

1. Focal length
2. Object distance
3. Image distance

4. **Radius of curvature**

53. If i and r be the angle of incidence and angle reflection respectively, then which one of the following conditions is correct when a light ray is reflected by a plane surface?

1. $i=r$
2. $i>r$
3. $i<r$
4. None of the above

54. The scientist who proposed the idea that the light ray always travels the path of least time is

1. Archimedes
2. Snell
3. **Fermat**
4. Raman

55. Which among the following is dimensionless physical quantity?

1. Power of lens
2. Radius of curvature
3. Wavelength

4. **Refractive index**

56. If n is the refractive index of a medium and v be the velocity of light in that medium, then which one of the following statements is correct?

1. **If n is high, v is low**
2. If n is high, v is also high
3. $n = v$ for all media
4. n and v are independent of each other

57. If n_1 and n_2 be the refractive indices of denser and rarer media respectively and C is the critical angle, then

1. $\sin C = n_1 / n_2$
2. **$\sin C = n_2 / n_1$**
3. $\sin C = \sqrt{n_1 / n_2}$
4. $\sin C = \sqrt{n_2 / n_1}$

58. The refractive index of glass is $3/2$. If the speed of light in vacuum is 3×10^8 m/s. then the speed of light in glass is

1. **2×10^8 m/s**
2. 3×10^8 m/s
3. 10^8 m/s
4. 1.5×10^8 m/s

59. The number of focal points, that every lens has, is

1. 4
2. 3
3. **2**
4. 1

60. A virtual, erected image is formed when an object is placed on the principal axis of a convex lens

1. Beyond the centre of curvature
2. At the centre of curvature
3. Between the centre of curvature and focal point

4. **Between focal point and optic centre**

61. An image is formed at a distance of 60 cm from the centre of a convex lens when the object distance is 30 cm. The focal length of the lens is

1. 90 cm
2. **20 cm**
3. 2 cm
4. 0.05 cm

62. Read the following two statements and pick the correct option:

- a) The virtual image can be captured on a screen.
- b) The real image can be captured on a screen.

1. Only (a) is true
2. **Only (b) is true**
3. Both (a) and (b) are true
4. Both (a) and (b) are false

63. The angle of vision for a healthy human being is about

1. 10°
2. 30°
3. **60°**
4. 90°

64. To correct one's hypermetropia defect, the type of lens to be used is

1. Biconcave
2. **Biconvex**
3. Plano-concave
4. Plano-convex

2. 9 Ω
3. 3 Ω
4. **1 Ω**

65. Which one among the following colours has the minimum angle of deviation?

1. **Red**
2. Blue
3. Green
4. Violet

72. An electric bulb of 360 Ω resistance is connected to a 6V battery. The power consumption is

1. **0.1 W**
2. 3 W
3. 2 W
4. 20 W

66. The formation of rainbow in the sky is due to the dispersion of sunlight by

1. Clouds
2. **Water droplets**
3. Air molecules
4. Water in the sea

73. Which one among the following statements is true?

1. Resistance of a conductor is independent of its length
2. **Resistance of a conductor is directly proportional to its length**
3. Resistance of a conductor is inversely proportional to its length
4. Resistance of a conductor is independent of its temperature

67. Which one of the following quantities has the unit dioptre?

1. Accommodation of lens
2. Focal length of lens
3. **Power of lens**
4. Refractive index

74. Oersted is the unit of

1. **Magnetic field strength**
2. Magnetic flux density
3. Magnetic pole strength
4. Magnetic flux

68. The product of potential difference and current gives

1. Resistance
2. **Electric power**
3. Electromotive force
4. Specific resistance

75. The magnetic force acting on a straight wire of length 'l' carrying a current 'i' which is placed perpendicular to the uniform magnetic field B is

1. B/il
2. i/Bl
3. il^2B
4. **ilB**

69. Read the following two statements and pick the correct answer:

- a) Semiconductors obey the Ohm's law.
- b) **Metallic conductors obey the Ohm's law.**

1. Only (a) is true
2. **Only (b) is true**
3. Both (a) and (b) are true
4. Both (a) and (b) are false

76. The law which states that 'an induced e.m.f. will appear in such a direction that it opposes the change in its flux' is

1. Faraday's law
2. Kirchhoff's loop law
3. Ohm's law
4. **Lenz's law**

70. Which among the following materials have their resistivity of the order 10^{14} to 10^{16} Ω -m?

1. Conductors
2. Semiconductors
3. **Insulators**
4. All

77. 1 tesla =

1. 1 weber
2. **1 weber/metre²**
3. 1 watt/ metre²
4. 1 coulomb

71. Three resistors each of value 3 Ω are connected in parallel combination. The equivalent resistance is

1. 27 Ω

78. In which among the following, the principle of electromagnetic induction is not involved?

1. In security check, where people are made to walk through a large upright coil of wire
2. Working of tape recorder

3. Working of an electric bulb

4. Working of ATM cards

79. Oxidation reaction involves

1. Addition of H₂
2. Removal of O₂

- 3. Removal of H₂**
4. None

80. The gaseous mixture contains hydrogen and oxygen in the ratio of 1:8 by mass respectively. The ratio of the number of molecules of hydrogen and oxygen in the above mixture is

1. 1:8
2. 8:1
3. 1:2
- 4. 2:1**

81. Match the following.

Column-A

- a) $C + O_2 \rightarrow CO_2 + Q$
- b) $N_2 + O_2 \rightarrow 2NO + Q$
- c) Antioxidants
- d) Stainless steel

Column-B

- 1) Prevent rancidity
- 2) Alloy
- 3) Endothermic reaction
- 4) Exothermic

1. (a) (b) (c) (d)
(1) (2) (3) (4)
2. (a) (b) (c) (d)
(4) (3) (2) (1)
- 3. (a) (b) (c) (d)
(4) (3) (2) (1)**
4. (a) (b) (c) (d)
(3) (4) (2) (1)

82. In the reaction $2PbO + C \rightarrow 2Pb + CO_2$

1. Carbon is reduced
2. PbO is oxidized
- 3. PbO is reduced**
4. PbO reduces carbon to CO₂

83. Which one of the following statements is wrong for the chemical reaction $A+B \rightarrow C$ if the reactants and product are gaseous in state?

- 1. One litre of A combines with one litre of B to give one litre of C.**
2. One mole of A combines with one mole of B to give one mole of C.
3. One gram A combines with one gram of B to give one gram of C.
4. One molecule of A combines with one molecule of B to give one molecule of C.

84. The volume of oxygen required for complete oxidation of 2 litres of methane at STP is

1. 4 litres
2. 12.25 litres
3. 1 litre
- 4. 8 litres**

85. Which one of the following produces more number of OH⁻ ions?

1. HCl solution

2. CH₃COOH solution
3. NH₄OH solution
- 4. NaOH solution**

86. Which one of the following produces more number of H₃O⁺ ions?

- 1. HCl solution**
2. CH₃COOH solution
3. NH₄OH solution
4. Mg(OH)₂ solution

87. Which one of the following is a weak base?

1. KOH
2. NaOH
- 3. NH₄OH**
4. None of the above

88. Which one of the following group elements are known as chalcogens?

- 1. 16**
2. 6
3. 1
4. 17

89. The number of electrons that are present in p-orbitals of Cl⁻ ion is

1. 6
2. 5
3. 11

4. 12

90. Elliptical orbits are introduced by

1. Bohr
2. Sommerfeld
3. Schrodinger
4. Zeeman

91. Which one of the following is the correct configuration of O^{2-} ?

1. $1s^2 2s^2 2p^4$
2. $1s^2 2s^2 2p^6$
3. $1s^2 2s^2 2p^2$
4. $1s^2 2s^2 2p^5$

92. Where do Na and N belong?

1. s-block
2. Na belongs to s-block and N belongs to d-block
3. p-block
4. Na belongs to s-block and N belongs to p-block

93. The atomic numbers of actinide series elements are

1. 58 to 71
2. 90 to 103
3. 92 to 105
4. 60 to 73

94. The order of second ionization energy values of O and N is

1. $O > N$
2. $N > O$
3. $O = N$
4. IE_2 is less than IE_1

95. Generally the order of electro negativity in groups

1. Decreases
2. Increases
3. Remain same
4. Initially decreases and then increases

96. Which one of the following is not an ionic compound?

1. NaF
2. NaCl
3. MgO
4. NH_3

97. The molecule with two bond pairs in two covalent bonds around the nucleus the central atom without any lone pair in the valence shell is

1. $BeCl_2$
2. BF_3
3. NH_3
4. CH_4

98. Which of the following is used as reducing agent in metallurgical process?

1. Coke
2. O_2
3. $KMnO_4$
4. None of these

99. The metal which does not displace hydrogen from dil. HCl is

1. Zn
2. Mg
3. Cu
4. Fe

100. Generally metallic oxides are converted into metals by

1. Roasting
2. Calcinations
3. Oxidation
4. Reduction