

NTSE STAGE – 1

SOLUTION - PHYSICS

1. (A)
 For super conductors,
 Resistivity (ρ) = 0
 \therefore Conductivity (σ) = $\frac{1}{\rho} = \frac{1}{0} = \infty$

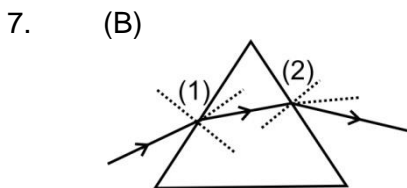
2. (B)
 SI unit of Magnetic field intensity (\vec{B}) is “Tesla (T)”

3. (A)
 If Distance = 0; object is at rest
 So, Displacement = 0

4. (C)
 Viscous force is fluid friction, it is non-conservative in nature.

5. (C)
 Escape velocity is given by $V_e = \sqrt{2gR}$
 $= \sqrt{2 \times 9.8 \times 6.4 \times 10^6}$
 $= 11.2 \text{ km/s}$

6. (B) When a satellite falls to an orbit of smaller radius, its orbital speed increases.
 Hence its K.E. will increase.

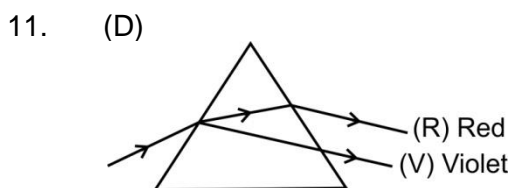


Ray bends twice

8. (A)
 Transverse waves can not exist in a gas medium. Hence waves inside gas are always longitudinal.

9. (D)
 Petroleum

10. (A)
 Moon



12. (C)
 All Jovian planets have rings around them.
 i.e. Jupiter, Saturn, Uranus, Neptune.

13. (C)
 $1 \text{ kWh} = (1000 \text{ W}) \times (3600\text{s}) = 3.6 \times 10^6 \text{ Ws} = 3.6 \times 10^6 \text{ J}$

SOLUTION – CHEMISTRY

14. (B)
Milk : Because it is only colloidal solution among them.
15. (D)
Soda water : Homogeneous solution of liquid water and CO₂ dissolved in it under pressure
16. (A)
MgCl₂ : Magnesium chloride
17. (C)
Isotopes are those chemical species which have same atomic number (i.e. number of proton and number of electrons) but different atomic mass.
18. (B)
Electronic configuration of Cl⁻ is 2, 8, 8
19. (D)
Electronic configuration of Na is 2, 8, 1 as its atomic number is 11
20. (A) & (B)
At 0°C water can exist in both i.e. solid and liquid state so both a and b are correct.
(most appropriate answer is (A) among all options)
21. (A)
Homogeneous solution
22. (A)
Fractional distillation (using difference in boiling point of gases)
23. (B)
Cl⁻ chloride anion
24. (A)
J.J. Thomson
25. (A)
2n²
26. (A)
Atomic number of C is 6 so its electronic configuration will be 2, 4

SOLUTION – BIOLOGY

- 27. D
- 28. B
- 29. D
- 30. B
- 31. A
- 32. D
- 33. B
- 34. D
- 35. B
- 36. D
- 37. A
- 38. B
- 39. C
- 40. C

SOLUTION – SST

- | | |
|------|------|
| 41.B | 61.C |
| 42.A | 62.A |
| 43.C | 63.A |
| 44.D | 64.A |
| 45.C | 65.D |
| 46.A | 66.C |
| 47.A | 67.A |
| 48.B | 68.A |
| 49.C | 69.B |
| 50.D | 70.B |
| 51.A | 71.B |
| 52.A | 72.A |
| 53.C | 73.C |
| 54.B | 74.D |
| 55.C | 75.A |
| 56.D | 76.C |
| 57.C | 77.B |
| 58.A | 78.A |
| 59.B | 79.D |
| 60.B | 80.B |

MATHS

81. (D)
 $q \neq 0$
82. (A)
 $p(n) = 2n + 1$
 $2n + 1 = 0$
 $x = -1/2$
83. (D)
 ∞
84. (A)
 $\angle P = \angle Q = \angle R = \angle S = 90^\circ$
PQRS is rectangle
85. (D)
 $V = 15a^3 = 15 \times 3^3 = 405$
86. (B)
87. (C)
Mean of $\left(\frac{n}{2}\right)^{\text{th}}$ and $\left(\frac{n}{2} + 1\right)^{\text{th}}$ term
88. (C)
89. (B)
90. (B) 3
91. (A)
 $\frac{x-1}{y} = \frac{1}{3}$ $\frac{x}{y+8} = \frac{1}{4}$
 $3x - 3 = y$ $4x = y + 8$
 $3x - 3 = 4x - 8$
 $5 = x$ $y = 12$
92. (A)
 $a_n = a + (n - 1)d$
 $99 = 12 + (n - 1)3$
 $(n - 1) = 87/3$
 $N = 30$
93. (B)
 $AB^2 = AC^2$
 $6^2 + (y - 5)^2 = 4^2 + (y - 3)^2$
 $y = 9$
So, B (0, 9)
94. $\sec A(1 - \sin A)(\sec A + \tan A)$
 $(\sec A - \sec A \cdot \sin A)(\sec A + \tan A)$
 $(\sec A - \tan A)(\sec A + \tan A)$
 $\sec^2 A - \tan^2 A = 1$

95.

(A)

$$\begin{aligned} A &= \frac{\pi r^2 \theta}{360} \\ &= \frac{22}{7} \times 14 \times 14 \times \frac{30}{360} \\ &= \frac{154}{3} \end{aligned}$$

96.

(B)

$$\begin{aligned} \text{Sum} &= \frac{n(n+1)}{2} \\ \text{Mean} &= \frac{n+1}{2} \end{aligned}$$

97.

(C)

$$P(E) = \frac{\text{Favourable outcome}}{\text{Total outcome}} = 2/9$$

98.

(C)

All Integers are not rational number

99.

(C)

$$\begin{aligned} \tan 60 &= \frac{h}{15} \\ h &= 15\sqrt{3} \end{aligned}$$

100.

(A)

$$a_n = 3 + 2n$$

$$a_1 = 5$$

$$a_2 = 7$$

$$a_3 = 9$$

$$a_{24} = 3 + 48$$

$$= 51$$

$$S_{24} = \frac{n}{2}(a + \ell)$$

$$= \frac{24}{2}(5 + 51)$$

$$= 12 \times 56$$

$$= 672$$