

FT - 15 (FR) (NEET - CBSE, GSEB) (12 - 04 - 2026)

ANSWER KEY

Q	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
Ans	3	3	1	4	1	4	2	2	4	3	2	2	3	2	3	4	2	2	3	1	
Q	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
Ans	1	2	3	1	2	4	1	2	2	4	3	3	4	2	3	4	3	4	2	2	
Q	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	
Ans	3	3	2	2	4	4	2	2	2	2	4	3	4	1	3	2	2	4	3	3	
Q	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	
Ans	1	1	3	4	3	3	3	1	1	3	3	4	2	1	3	4	2	2	4	2	4
Q	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	
Ans	3	3	4	4	1	2	1	2	2	4	1	1	1	3	3	4	1	1	3	2	
Q	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	
Ans	1	4	3	1	4	1	3	1	1	4	1	2	1	1	3	3	2	2	1	3	
Q	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	
Ans	3	3	3	4	1	2	2	2	2	4	4	4	1	4	2	1	3	3	3	2	
Q	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	
Ans	2	1	3	2	4	4	4	1	3	2	1	1	2	2	2	2	1	1	4	2	
Q	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	
Ans	4	1	3	4	1	4	1	2	1	4	1	2	3	2	4	3	2	3	3	1	

PHYSICS:

1. Sol. (3)

Let $v^x = kg^y \lambda^z \rho^\delta$. Now by substituting the dimensions of each quantities and equating the powers of M , L and T we get $\delta = 0$ and $x = 2, y = 1, z = 1$.

2. Sol. (3)

$$t = \sqrt{\frac{2h}{g+a}} = \sqrt{\frac{2 \times 2.7}{9.8+1.2}} = \sqrt{\frac{5.4}{11}} = \sqrt{0.49} = 0.7 \text{ sec}$$

As $u = 0$ and lift is moving upward with acceleration

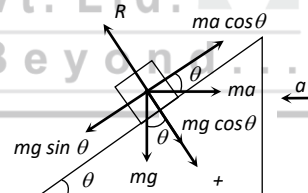
3. Sol. (1)

$$\frac{mv^2}{r} = \frac{k}{r^2} \Rightarrow mv^2 = \frac{k}{r} \therefore \text{K.E.} = \frac{1}{2}mv^2 = \frac{k}{2r}$$

$$\text{P.E.} = \int F dr = \int \frac{k}{r^2} dr = -\frac{k}{r}$$

$$\therefore \text{Total energy} = \text{K.E.} + \text{P.E.} = \frac{k}{2r} - \frac{k}{r} = -\frac{k}{2r}$$

4. Sol. (4)



When the whole system is accelerated towards left then pseudo force (ma) works on a block towards right.

For the condition of equilibrium

$$mg \sin \theta = ma \cos \theta \Rightarrow a = \frac{g \sin \theta}{\cos \theta}$$

\therefore Force exerted by the wedge on the block

$$R = mg \cos \theta + ma \sin \theta \quad R = mg \cos \theta + m \left(\frac{g \sin \theta}{\cos \theta} \right) \sin \theta$$

$$= \frac{mg(\cos^2 \theta + \sin^2 \theta)}{\cos \theta}$$

$$R = \frac{mg}{\cos \theta}$$

5. Sol. (1)

Retarding force $F = ma = \mu R = \mu mg \therefore a = \mu g$

Now from equation of motion $v^2 = u^2 - 2as$

$$\Rightarrow 0 = u^2 - 2as \Rightarrow s = \frac{u^2}{2a} = \frac{u^2}{2\mu g} \therefore = \frac{v_0^2}{2\mu g}$$

6. Sol. (4)

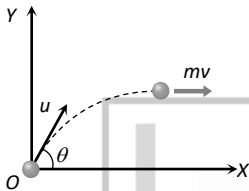
$$S = \frac{t^3}{3} \therefore dS = t^2 dt$$

$$a = \frac{d^2S}{dt^2} = \frac{d^2}{dt^2} \left[\frac{t^3}{3} \right] = 2t \text{ m/s}^2$$

Now work done by the force $W = \int_0^2 F \cdot dS = \int_0^2 ma \cdot dS$

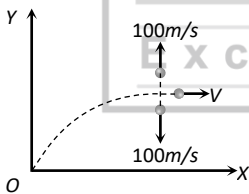
$$\int_0^2 3 \times 2t \times t^2 dt = \int_0^2 6t^3 dt = \frac{3}{2} [t^4]_0^2 = 24 \text{ J}$$

7. Sol. (2)



Momentum of ball (mass m) before explosion at the highest point $= mv \hat{i} = mu \cos 60^\circ \hat{i}$

$$= m \times 200 \times \frac{1}{2} \hat{i} = 100 m \hat{i} \text{ kgms}^{-1}$$



Let the velocity of third part after explosion is V

After explosion momentum of system =

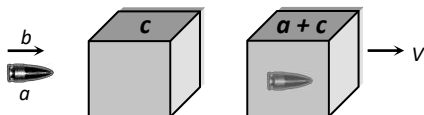
$$\vec{P}_1 + \vec{P}_2 + \vec{P}_3$$

$$= \frac{m}{3} \times 100 \hat{j} - \frac{m}{3} \times 100 \hat{j} + \frac{m}{3} \times V \hat{i}$$

By comparing momentum of system before and after the explosion

$$\frac{m}{3} \times 100 \hat{j} - \frac{m}{3} \times 100 \hat{j} + \frac{m}{3} V \hat{i} = 100 m \hat{i} \Rightarrow V = 300 \text{ m/s}$$

8. Sol. (2)



Initially bullet moves with velocity b and after collision bullet get embedded in block and both move together with common velocity.

By the conservation of momentum

$$\Rightarrow a \times b + 0 = (a + c) V \Rightarrow V = \frac{ab}{a + c}$$

9. Sol. (4)

$$g = \frac{4}{3} \pi \rho G R \therefore \frac{g_1}{g_2} = \frac{R_1 \rho_1}{R_2 \rho_2}$$

10. Sol. (3)

$$T = 2\pi \sqrt{\frac{r^3}{GM}} \Rightarrow T^2 = \frac{4\pi^2}{GM} (R + h)^3$$

$$\Rightarrow R + h = \left[\frac{GMT^2}{4\pi^2} \right]^{1/3} \Rightarrow h = \left[\frac{GMT^2}{4\pi^2} \right]^{1/3} - R$$

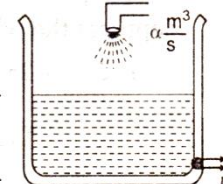
11. Sol. (2)

$$\text{Work done} = 4\pi R^2 T (n^{1/3} - 1) = 4\pi \left(\frac{D}{2} \right)^2 \sigma (n^{1/3} - 1)$$

$$= \pi D^2 \sigma (27^{1/3} - 1) = 2\pi D^2 \sigma$$

12. Sol. (2)

Level of water in the vessel will be maximum when rate of inflow of water = rate of outflow of water



$$\text{or } \alpha = av$$

$$\text{or } \alpha = a \sqrt{2gh}$$

$$\text{or } h = \frac{\alpha^2}{2ga^2}$$

$$\text{i.e. } h \propto \alpha^2$$

13. Sol.(3)

PV = constant

T = constant

$$\text{Now } \rho = \frac{PM}{RT}$$

or $\rho \propto P$ for T = constant

Hence, P- ρ graph is a straight line passing through origin.

14. Sol. (2)

In adiabatic process, slope of PV -graph.

$$\frac{dP}{dV} = -\gamma \frac{P}{V} \Rightarrow |\text{Slope}| \propto \gamma$$

From the given graph $(\text{Slope})_2 > (\text{Slope})_1 \Rightarrow$

$\gamma_2 > \gamma_1$ therefore 1 should correspond to O_2 ($\gamma =$

1.4) and 2 should correspond to He ($\gamma = 1.66$)

15. **Sol. (3)**

According to Newton's law of cooling Rate of cooling \propto Mean temperature difference

$$\Rightarrow \frac{\text{Fall in temperature}}{\text{Time}} \propto \left(\frac{\theta_1 + \theta_2}{2} - \theta_0 \right)$$

$$\therefore \left(\frac{\theta_1 + \theta_2}{2} \right)_1 > \left(\frac{\theta_1 + \theta_2}{2} \right)_2 > \left(\frac{\theta_1 + \theta_2}{2} \right)_3$$

$$\Rightarrow T_1 < T_2 < T_3$$

16. **Sol. (4)**

$$T = 2\pi \sqrt{\frac{l}{g}} \Rightarrow T \propto \frac{l}{\sqrt{g}}$$

$$\Rightarrow \frac{\Delta T}{T} \times 100 = -\frac{1}{2} \left(\frac{\Delta g}{g} \right) \times 100 = -\frac{1}{2} (-2\%) = 1\%$$

17. **Sol. (2)**

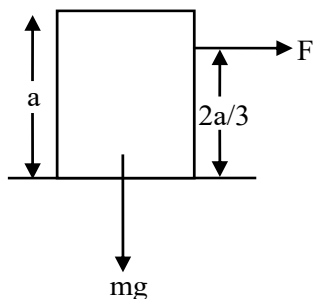
Standard wave equation which travel in negative x direction is $y = A \sin(\omega t + kx + \phi_0)$

For the given wave $\omega = 2\pi m = 15\pi$, $k = \frac{2\pi}{\lambda} = 10\pi$

$$\text{Now } v = \frac{\text{Co-efficient of } t}{\text{Co-efficient of } x} = \frac{\omega}{k} = \frac{15\pi}{10\pi} = 1.5 \text{ m/sec}$$

$$\text{and } \lambda = \frac{2\pi}{k} = \frac{2\pi}{10\pi} = 0.2 \text{ m.}$$

18. **Sol. (2)**



Balancing torque about point o

$$Mg (a/2) = F (2a/3),$$

$$F = 3/4 mg$$

19. **Sol. (3)**

$${}_1\mu_2 = \frac{1}{\sin C} \Rightarrow \frac{\mu_2}{\mu_1} = \frac{\lambda_1}{\lambda_2} = \frac{1}{\sin C}$$

$$\Rightarrow \frac{6000}{4000} = \frac{1}{\sin C} \Rightarrow C = \sin^{-1} \left(\frac{2}{3} \right)$$

20. **Sol. (1)**

In the direction of electric field, potential decreases.

21. **Sol. (1)**

22. **Sol. (2)**

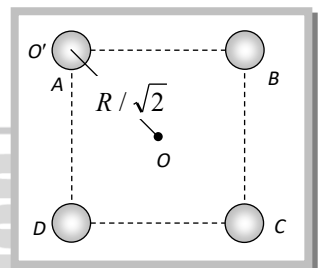
$$M. I. \text{ of sphere } A \text{ about its diameter } I_{O'} = \frac{2}{5} Mr^2$$

Now $M. I.$ of sphere A about an axis perpendicular to the plane of square and passing through its

$$\text{centre will be } I_O = I_{O'} + M \left(\frac{R}{\sqrt{2}} \right)^2 = \frac{2}{5} Mr^2 + \frac{MR^2}{2}$$

[by the theorem of parallel axis]

Moment of inertia of system (i.e. four sphere)



$$= 4I_O = 4 \left[\frac{2}{5} Mr^2 + \frac{MR^2}{2} \right]$$

$$= \frac{2}{5} M [4r^2 + 5R^2]$$

23. **Sol. (3)**

$$P = \tau \omega$$

$$\Rightarrow \tau = \frac{100 \times 10^3}{2\pi \frac{1800}{60}} = 531 \text{ N-m}$$

24. **Sol. (1)**

$$l = \frac{FL}{\pi r^2 Y} \therefore l \propto \frac{L}{r^2} \text{ (Y and F are constant)}$$

$$\frac{l_2}{l_1} = \frac{L_2}{L_1} \times \left(\frac{r_1}{r_2} \right)^2 = (2) \times \left(\frac{1}{2} \right)^2 = \frac{1}{2}$$

$$\Rightarrow l_2 = \frac{l_1}{2} = \frac{0.01m}{2} = 0.005m$$

25. **Sol. (2)**

$$F = - \left(\frac{dU}{dx} \right).$$

In the region BC slope of the graph is positive

$\therefore F =$ negative i.e. force is attractive in nature

In the region AB slope of the graph is negative

∴ F = positive i.e. force is repulsive in nature

26. Sol. (4)

$\vec{a} \cdot \vec{b} = 0$ i.e. \vec{a} and \vec{b} will be perpendicular to each other

$\vec{a} \cdot \vec{c} = 0$ i.e. \vec{a} and \vec{c} will be perpendicular to each other

$\vec{b} \times \vec{c}$ will be a vector perpendicular to both \vec{b} and \vec{c}

So \vec{a} is parallel to $\vec{b} \times \vec{c}$

27. Sol. (1)

If suppose initial length $l_1 = 100$ then

$$l_2 = 100 + 100 = 200$$

$$\frac{R_1}{R_2} = \left(\frac{l_1}{l_2}\right)^2 = \left(\frac{100}{200}\right)^2 \Rightarrow R_2 = 4R_1$$

$$\frac{\Delta R}{R} \times 100 = \frac{R_2 - R_1}{R_1} \times 100 = \frac{4R_1 - R_1}{R_1} \times 100 = 300\%$$

28. Sol. (2)

When one of the slits is closed, there appears general illumination from a single source. Interference does not take place.

29. Sol. (2)

Here internal resistance is given by the slope of

graph i.e. $\frac{x}{y}$. But conductance = $\frac{1}{\text{Resistance}} = \frac{y}{x}$

30. Sol. (4)

$$\frac{H}{t} = \frac{V^2}{R} \Rightarrow \frac{H}{t} \propto \frac{1}{R}$$

31. Sol. (3)

Magnetic field on the axis of circular current

$$B = \frac{\mu_0}{4\pi} \cdot \frac{2\pi i r^2}{(x^2 + r^2)^{3/2}} \Rightarrow B \propto \frac{nr^2}{(x^2 + r^2)^{3/2}}$$

32. Sol. (3)

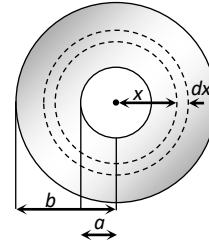
$$\text{Number of turns per unit width} = \frac{N}{b-a}$$

Consider an elemental ring of radius x and with thickness dx Number of turns in the ring

$$= dN = \frac{Ndx}{b-a}$$

Magnetic field at the centre due to the ring element

$$dB = \frac{\mu_0 (dN)i}{2x} = \frac{\mu_0 i}{2} \cdot \frac{Ndx}{(b-a)} \cdot \frac{1}{x}$$



∴ Field at the centre

$$= \int dB = \frac{\mu_0 Ni}{2(b-a)} \int_a^b \frac{dx}{x}$$

$$= \frac{\mu_0 Ni}{2(b-a)} \ln \frac{b}{a}$$

33. Sol. (4)

Since |Displacement| ≤ Distance

$$\therefore \frac{|\text{Displacement}|}{\text{time}} \leq \frac{\text{Dis tan ce}}{\text{time}}$$

|Average velocity| ≤ Average speed

34. Sol. (2)

$$I = \frac{M}{V} = \frac{M}{\text{mass/density}}$$

$$\text{given mass} = 1\text{gm} = 10^{-3}\text{kg},$$

$$\text{and density} = 5\text{gm/cm}^3 = \frac{5 \times 10^{-3}\text{kg}}{(10^{-2})^3\text{m}^3} = 5 \times 10^3\text{kg/m}^3$$

$$\text{Hence } I = \frac{6 \times 10^{-7} \times 5 \times 10^3}{10^{-3}} = 3$$

35. Sol. (3)

$$\text{Self-inductance } L = \mu_0 N^2 A / l = \mu_0 n^2 l A$$

Where n is the number of turns per unit length and N is the total number of turns and $N = nl$

In the given question n is same. A is increased 4 times and l is increased 2 times and hence L will be increased 8 times.

36. Sol. (4)

$$P = \frac{e^2}{R}; e = -\frac{d}{dt}(BA) = A \frac{d}{dt}(B_0 e^{-t}) = AB_0 e^{-t}$$

$$\Rightarrow P = \frac{1}{R}(AB_0 e^{-t})^2 = \frac{A^2 B_0^2 e^{-2t}}{R}$$

$$\text{At the time of starting } t = 0 \text{ so } P = \frac{A^2 B_0^2}{R}$$

$$\text{Sol. } \Rightarrow P = \frac{(\pi r^2)^2 B_0^2}{R} = \frac{B_0^2 \pi^2 r^4}{R}$$

37. Sol. (3)

Initially, $T = 2\pi\sqrt{\frac{M}{k}}$ and

Finally, $\frac{5T}{3} = 2\pi\sqrt{\frac{M+m}{k}}$

$\therefore \frac{5}{3} \times 2\pi\sqrt{\frac{M}{k}} = 2\pi\sqrt{\frac{M+m}{k}}$

or $\frac{25M}{9k} = \frac{M+m}{k}$

or $9m + 9M = 25M$ or $\frac{m}{M} = \frac{16}{9}$

38. Sol. (4)

Phase angle $\phi = 90^\circ$, so power $P = Vi \cos \phi = 0$

39. Sol. (2)

At resonant frequency, $X_L = X_C \therefore Z = R$

(minimum) there for current in the circuit is maximum.

40. Sol. (2)

$\lambda = \frac{h}{\sqrt{2mE}} \Rightarrow \lambda \propto \frac{1}{\sqrt{m}}$

(E = same)

41. Sol. (3)

When the atom gets appropriate energy from outside, then this electron rises to some higher energy level. Now it can return either directly to the lower energy level or come to the lowest energy level after passing through other lower energy levels, hence all possible transitions take place in the source and many lines are seen in the spectrum.

42. Sol. (3)

By using $O = \sqrt{I_1 I_2} \Rightarrow O = \sqrt{8 \times 2} = 4 \text{ cm}$

43. Sol. (2)

The current through circuit

$i = \frac{P}{V} = \frac{100 \times 10^{-3}}{0.5} = 0.2 \text{ A}$

\therefore voltage drop across resistance = $1.5 - 0.5 = 1 \text{ V}$

$\Rightarrow R = \frac{1}{0.2} = 5 \Omega$.

44. Sol. (2)

Given that $K_1 + K_2 = 5.5 \text{ MeV} \dots(i)$



From conservation of linear momentum

$P_1 = P_2$

or $\sqrt{2K_1(216m)} = \sqrt{2K_2(4m)}$

as $p = \sqrt{2Km}$

$\therefore K_2 = 54K_1$

$\dots(ii)$

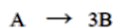
Solving equation (i) and (ii) we get $K_2 = \text{K.E. of } \alpha\text{-particle} = 5.4 \text{ MeV}$

45. Sol. (4)

As we know that;

- i. Source of microwave frequency is magnetron valve
- ii. Source of infrared frequency is vibration of atoms and molecules.
- iii. Source of gamma ray is radioactive decay of nucleus.
- iv. Source of X-ray is transition of electron in inner shells.

79. Sol.(2)



$$\text{conc. at } t=0 \quad a \quad 0$$

$$\text{conc. at } t=t \quad (a-x) \quad 3x$$

$$\text{When } \frac{3x}{a-x} = 1, \text{ then } x = \frac{a}{4}$$

$$\therefore t = \frac{2.303}{k} \log \frac{a}{a-x}$$

$$\frac{2.303}{2.303 \times 10^{-4}} \log \frac{a}{a-\frac{a}{4}} = 10^4 \times (\log 4 - \log 3)$$

$$= 1200 \text{ second} = 20 \text{ minute}$$

80. Sol.(4)

$$A_1 \cdot e^{-E_{a1}/RT} = A_2 \cdot e^{-E_{a2}/RT}$$

$$\frac{A_2}{A_1} = e^{(E_{a2}-E_{a1})/RT}$$

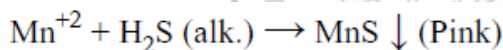
$$10^2 = e^{\frac{1200}{RT}}$$

$$2 \ln 10 = \frac{1200}{RT}$$

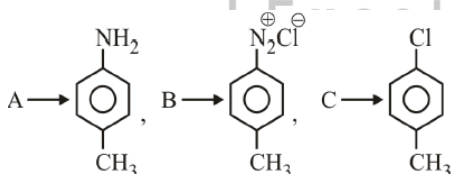
$$2 \times 2.303 = \frac{1200}{2 \times T}; T = \frac{600}{4.606} \text{ K}$$

81. Sol.(3)

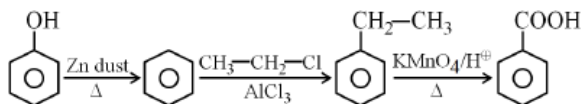
82. Sol.(3)



83. Sol.(4)



84. Sol.(4)



85. Sol.(1)

$$\alpha = \sqrt{\frac{K_a}{C}}; \frac{\alpha_1}{\alpha_2} = \sqrt{\frac{C_2 = 0.001}{C_1 = 0.1}} = \sqrt{10^{-2}}$$

$$\frac{\alpha_1}{\alpha_2} = 10^{-1} = \frac{1}{10}$$

86. Sol.(2)

Principal Quantum number determines, size & energy of shell.

Azimuthal Quantum number determines shape and angular momentum of electron in orbital.

87. Sol.(1)

$$\text{For saturated solution : } \Lambda_m^\infty = \kappa \times \frac{1000}{s}$$

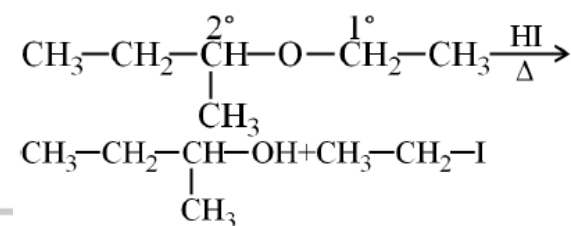
$$s = \frac{1.44 \times 10^{-6} \times 1000}{144}$$

$$s = 10^{-5} \text{ M}$$

$$\text{For AB type : } K_{sp} = s^2 = (10^{-5})^2$$

$$K_{sp} = 1 \times 10^{-10}$$

88. Sol.(2)



89. Sol.(2)

Electron affinity order is: Cl > F > Br > I.

90. Sol.(4)

-NO₂ is deactivating group so can't show FCR.