

**Practice paper term 1**

**Class xii**

**Marking Scheme**

**Physics**

Section A		
Q. No.	Correct option	Hint/main points
1	a	Decreases K times
2	d	no work is done
3	a	$25 \times 10^{-2} \text{ J}$  Hint: $U = (1/2)CV^2$ $= (1/2)(50 \times 10^{-6}) \times 100 \times 100$ $= 25 \times 10^{-2} \text{ J}$
4	c	1:1  Hint: $B_A = \mu_0 I / 2R$ and $B_B = \mu_0 (2I) / 2 (2R)$ $= \mu_0 I / 2R$ Therefore $B_A / B_B = 1:1$
5	b	Very weak temperature dependent resistivity
6	a	$3.1 \times 10^{-4} \text{ T}$  Hint: $B = \mu_0 NI / 2r = 4\pi \times 10^{-7} \times 100 \times 0.40 / (2 \times 0.08) = 3.1 \times 10^{-4} \text{ T}$
7	a	$\tan^{-1} 1.7272$  Hint: $\tan \epsilon = B_V / B_H = 0.38 / 0.22$ $= 1.7272; \epsilon = \tan^{-1} 1.7272$
8	a	Scalar Quantity
9	a	Gauss's law

10	c	$1.6 \times 10^{-19} \text{ C}$
11	d	$E_{\text{axial}} = 1/4\pi\epsilon_0 (2p/r^3)$
12	d	All of the above
13	a	Parallel planes perpendicular to the direction of electric field.
14	c	$Q \propto V$
15	b	The magnetic field lines of a magnet do not form continuous closed loops.
16	a	$m = NIA$
17	d	$e = - d\phi/dt$
18	b	(i) b c d a b ; (ii) b a c b
19	d	$6.28 \times 10^{-5} \text{ V}$  Solution: $e = Bvl = B(1/2rw)l = B \frac{1}{2} r (2 \pi f) l$ $= 0.4 \times 10^{-4} \times 0.5 \times$ $(22/7) \times (2 \text{ rps}) \times 0.5$ $= 6.28 \times 10^{-5} \text{ volts}$ here $v = \text{av. linear velocity} = \frac{1}{2}(\text{velocity at rim} + \text{velocity at axil})$ $= \frac{1}{2} (rw + 0)$ $= \frac{1}{2} r w$
20	a	Alternating voltage
21	a	Current I lags behind the voltage by $\pi/2$
22	c	$L dI/dt + IR + q/C = V$
23	d	Relates with L-C-R circuit.

24	b	$I_{\text{rms}} = I_m / \sqrt{2}$
25	a	Transformer
		Section B
26	c	$6 \times 10^{-3} \text{ N}$  Hint: Use formula $F = k q_1 q_2 / r^2$
27	b	+1.6 C  Hint: use $q = ne$
28	a	Increases
29	a	$4 \mu\text{F}$  Hint: As circuit is satisfying Wheatstone bridge condition $C_{AC} = (4 \times 4) / (4 + 4) +$ $(4 \times 4) / (4 + 4)$ $= 2 + 2 = 4 \mu\text{F}$
30	a	Decreases  Explanation: The net field between the plates decreases as an electric field is induced in the opposite direction of the applied field.
31	c	$4 \times 10^3 \text{ V/m}$  $E = V/d = 12 / 3 \times 10^{-3} = 4 \times 10^3 \text{ v/m}$

32	b	<p>30 A</p> <p><math>I_{\max} = E/r+R = 12/0.4+0 = 30 \text{ A}</math></p> <p>here <math>R=0</math> for max. Current</p>
33	d	<p>2.25 V</p> <p>Hint: Use <math>E_2/E_1 = l_2/l_1</math></p>
34	b	<p>gets doubled</p> <p>Hint; Use Drift velocity formula <math>V_d = eET/m</math></p>
35	a	(i) CD; (ii) AB
36	c	<p>resistance of 60 watt bulb is greater than resistance of 100 watt bulb</p> <p>Hint: Use <math>P = V^2/R</math></p>
37	c	Both a and b
38	a	$R_A < R_g < R_v$
39	d	0.96 Nm
40	b	Clockwise
41	a	Maximum in situation (i)
42	c	Four times

		Hint; $L = \mu_0 n^2 A I$ ; $L \propto n^2$
43	d	Pure resistor
44	d	Energy
45	d	A is false and R is also false  Explanation: A stationary charge produces only an electric field .A moving charge is associated both with electric and magnetic field
46	a	Both A and R are true and R is the correct explanation of A.  Explanation: A stationary charge produces only an electric field .A moving charge is associated both with electric and magnetic field.
47	a	Both A and R are true and R is the correct explanation of A.
48	a	Both A and R are true and R is the correct explanation of A.  Explanation: Repulsion between opposite pairs increase area enclosed by the irregular loop.
49	a	Both A and R are true and R is the correct explanation of A.  hint: As $T = 2\pi m/qB$ therefore $T \propto m/q$

50	d	Zero
51	d	2mC; hint: torque =P E sin 30° 4 =q x 2a E sin 30° q = 2 m C
52	a	Zero
53	d	Unknown resistance
54	c	Meter bridge
55	d	Galvanometer