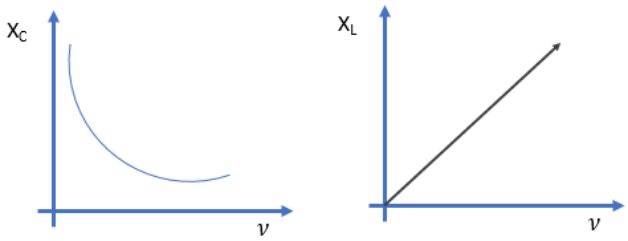
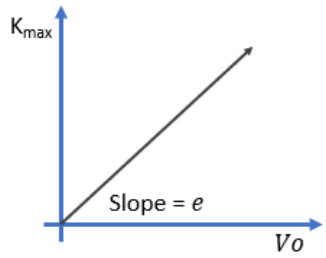
INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF SCIENCE 2020-21

Marking scheme Subject: Physics (042)

SECTION-A

1	$[M^{-1}L^{-3}T^{4}A^{2}]$	1
2	ZERO Or 0.711 microfarad	1
3	0.4%, $R = \rho l/A = \rho l^2/Al = \rho l^2/V$, $R \propto l^2$	1/2+1/2
4	Having infinite resistance, Or $[B] = [ML^{0}T^{-2}A^{-1}]$	1
5	Definition + M = m(2l)	1/2+1/2
6	$e = M\, di/dt$, $e = 7.5 \times 10^{3}$ V	1/2+1/2
7	No, increases as $Z = \sqrt{R2 + (\omega L)2}$ Or 	1/2+1/2
8	It carries energy and momentum.	1/2+1/2
9	$\lambda' = \lambda/\mu = 4000$Å, $f' = f = c/\lambda = 5 \times 10^{14}$ Hz Or plane	1/2+1/2 Or 1
10		1
11	c	1
12	d	1
13	a	1
14	d	1

SECTION-B

15	(i) a (ii) b (iii) a (iv) c (v) c	**1** **1** **1** **1**
16	(i) d (ii) a (iii) c (iv) b (v) a	**1** **1** **1** **1**

SECTION-C

17	**B = λD/d = 0.5 mm**	**1+1**
18	**$I_R = I_1 + I_2 + 2\sqrt{I1I2}$ COSϕ** **(i) $4I_O$** **(ii) 0**	**1** **½** **½**
19.	**μ = c/v = 1/sinC** **v = c sinC = 1.5 x 10^8 m/s** **Or** **For medium R, because angle of refraction is minimum, μ is maximum and speed is minimum.**	**1+1**
20	**Using formula e = V = W/q = [$ML^2T^{-3}A^{-1}$]** **And, rate of change of flux = dϕ/dt = BA/t = FA/qvt = [$ML^2T^{-3}A^{-1}$]** **Or** **(i) Self-inductance and mutual inductance** **(ii) self-inductance of a coil which induces unit volt of emf when rate of change in current is 1 amp/sec.**	**1+1**
21	**At the point of intersection, two tangents are obtained, not possible.** **Or** **Each diagram 1 mark**	**1+1**
22	**Each graph 1 mark**	
23.	**F = qvB sinθ** **(i) θ = 0** **(ii) θ = 90**	
24	**M = niA** **Direction depends on current (north to south polarity)** **[AL^2]**	
25.	**M = IA = 9 x 10^{-3} Am^2.** **Perpendicular to the plane away from the observer.**	

SECTION-D

26	**Statement of ohm's law** **Two different formula of drift velocity** **Comparing and proved.**	**1** **1** **1**
27	**Faradays 2nd experiment, diagram and explanation.** **Or** **e = Blv** **e = 0.21V**	**1+1+1**
28	**$\tan\phi = V_L - V_C/V_R = 0$** **$\phi = 0$**	**1+1+1**
29	**Definition of threshold frequency** **Definition of cut-off potential** **So that is can apply retarding force on photoelectrons in order to approach zero current.** **Or** **Each graph and slope**	**1+1+1** **1.5+1.5**
30	**$Mv^2/r = Kq^2/r^2$ and $mvr = nh/2\pi$** **R = 0.53Å.**	

SECTION-E

31	**B, as C = q/v** **Equipotential surfaces diagram** **Negative charge and diagram** **Or** **Graphs** **Proof** **And energy density**	**1+2+2**
32	**Faraday's law** **Lenz's law and comparison with mechanical work** **proof of e = Blv** **Or** **Theory** **Construction** **Working** **Diagram** **Graphical representation of changing the flux and induced voltage**	**1+2+2**
33	**(a) Definition of wavefront** **Types of wavefront with diagram** **Proof of reflection or reflection on basis of wave theory.** **Or** **Three different diagrams after reflection/refraction.** **Find λ using, $\lambda = c/v$** **Using $B = \lambda D/d$, $d = \lambda D/B = 1mm$.**	**1+2+2**