FORM TWO TERM ONE EXAM 2017

PHYSICS
MARKING SCHEME
PAPER 2

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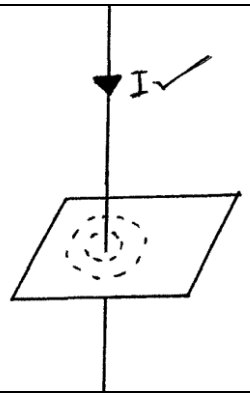
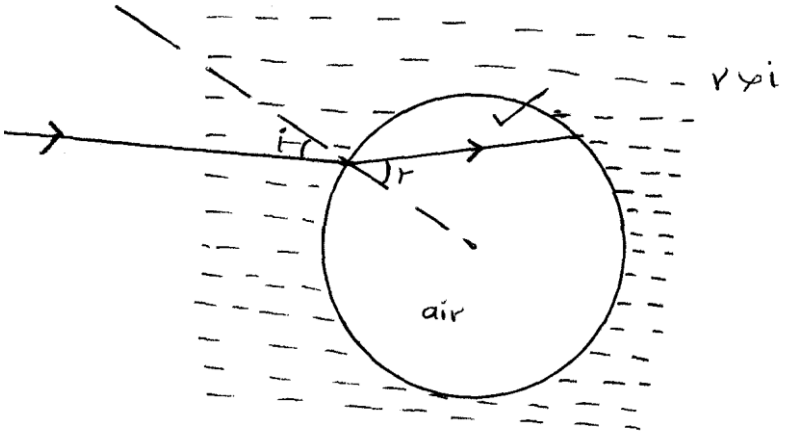
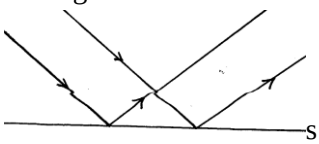
PHYSICS. PAPER 2
(THEORY)
MARKING SCHEME FORM 3

1.	SECTION A A luminous source of light emits light while a non-luminous source reflects light ✓	1mk
2.	Electrons are repelled from the cap and flow to the leaf and plate.✓ Repulsion between the electrons on the plate and those on the leaf causes the leaf to rise.✓	2mks
3.	f = $\frac{Number\ of\ waves}{Time\ taken}$ ✓ = $\frac{1\frac{3}{4}}{35\times10^{-3}} = 50H_3$ ✓ Alt. $f = \frac{1}{T} = \frac{1}{25-5\times10^{-3}}$ = $50H_3$ ✓	2mks
4.	Width of the aperture/ slit should be approximately or nearly equal to λ of the incident wave;	2mks
5.	Slope = $\frac{0.9-0.4}{3-7}$ ✓ = $-\frac{1}{f}$ ✓ = $-\frac{0.5}{5} = 0.125$ f = 8cm ✓	3mks
6.	P = $\frac{V^2}{R}$ ✓ R = $\frac{V^2}{P} = \frac{240^2}{2500}$ = 23.04Ω ✓	2mks
7.		1mk
8.	Repulsion only occurs between like poles of magnets while attract also occur between a magnet and a magnetic material	1mk

9.		1mk
10.	Hydrogen gas bubbles form around the positive plate. ✓ The hydrogen gas insulates the positive plate thus increasing internal resistance ✓	2mks
11.	Electrons are attracted towards the rod leaving the atoms at the other end of the ball with net positive charges Trees absorb sound	2mks 1mks
12.	In conductor the resistance increases with increase ✓ in temperature while in a semiconductor the resistance reduces with increase in temperature.	1mk
13.	E = Ir + IR ✓ = 2 x 0.5 + 2 x 10 = 11V ✓	2mks
	SECTION B	
14.	(a) (i) The ratio of the sine of angle of incidence to the sine of angle of refraction is a constant for a pair of media (ii) – Do not absorb light energy like mirrors - Not affected by thickness as mirrors - Do not wear off like the peeling of siyvering on mirror. (b) (i) $k^nw = k^na\ a^nw$ $= \frac{1}{1.44} \times 1.33 = 0.9236$ (ii) $i = 70^0$ $\frac{Sini}{Sinr} = 0.9236$ $Sin\ r = \frac{sin\ 70^0}{0.9236} = 1.0174$ r is greater than 90^0 hence the light reflection  (iii) The different colours travel at different velocities hence would have different angles of refraction and are dispersed (iv) The eye would see a spectrum since the light rays are dispersed in the kerosene layer and are internally reflected at the kerosene – water surface the eye would see a spectrum at the surface	1mk 2mks 3mks 3mks 1mks 2mks
15.	(a) Current flowing through a conductor is directly proportional to the potential difference across it provided the temperature and other physical conditions are kept constant (b) (i) The work done in driving charges through the coil is high due to its resistance. This energy is converted into heat in the coil (ii) $V = IR \quad R = \frac{V}{I}✓ \quad = \frac{12V}{2.4}✓$ $= 5.0\Omega$ (iii) H = VIt H = 12 x 2.4 x 60	1mk 2mks 3mks

	= 1728J (iv) – Using a source with higher emf - Reducing the length of the coil = P = $\frac{V^2}{R}$	3mks 2mks
16.	(a) capacitance c is the charge stored in a capacitor per unit voltage (i) the deflection of the leaf decreases since the pd reduces with the distance of separation, the greater the deflection, the smaller the capacitance. (ii) the deflection of the decreases since the pd increases with the area of overlaps or the greater the deflection the smaller the capacitance. (iii) the deflection of the leaf decreases, the capacitance increases ,since the smaller the deflection the greater the capacitance. $C_T=C_1+\frac{C_2C_3}{C_2+C_3}$ ✓1 $=3\mu F+\frac{4\times 4}{4+4}$ ✓1 $=3\mu$ F+2 μ F✓1 $=5\mu$ f✓1 Charge on the 3 μ F capacitor is the same as the overall charge Q =CV✓1 =5.0×10✓1 =50C✓1	1mk 2mks 2mks 2mks 3mks 3mks
17.	$(a)(i)T=\frac{T}{20}=\frac{36}{20}=1.8s$ $(ii)\ f=\frac{1}{T}=\frac{1}{1.8}=0.5556Hz$ $(c)80cm\Rightarrow S4\lambda$ $V=f\lambda$ $=\frac{1}{1.8}\times 0.2=0.111m/s$	2mks 3mks 3mks
18.	a)- A small force (effort) is used to overcome a large force (Load) - Less energy is expended in doing work - Less time is used in accomplishing the task b) (i) - In one revolution, both wheel and axle complete one circumference - V.R = Effort Distance/Load distance = $2\prod$ R/$2\prod$ r - V.R = R/r (ii) V.R = 50/5 = 10 M.A = efficiency x V.R/100 = 90x10/100 = 9 Effort = Load/M.A = 200/9 = 22.22N c) Gas Pressure = At.Pressure – Pressure due to H_g Volume P_g = 1.0x10^5 – 0.4 x 13600x10 = 94560N/m^2 d) By lowering the temperature of the liquid	2mks 3mks 3mks 3mks 1mk