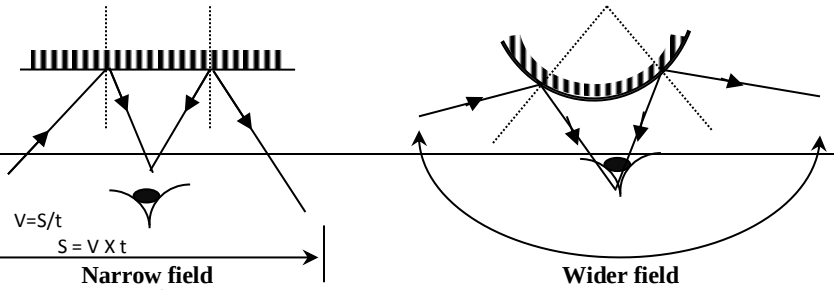
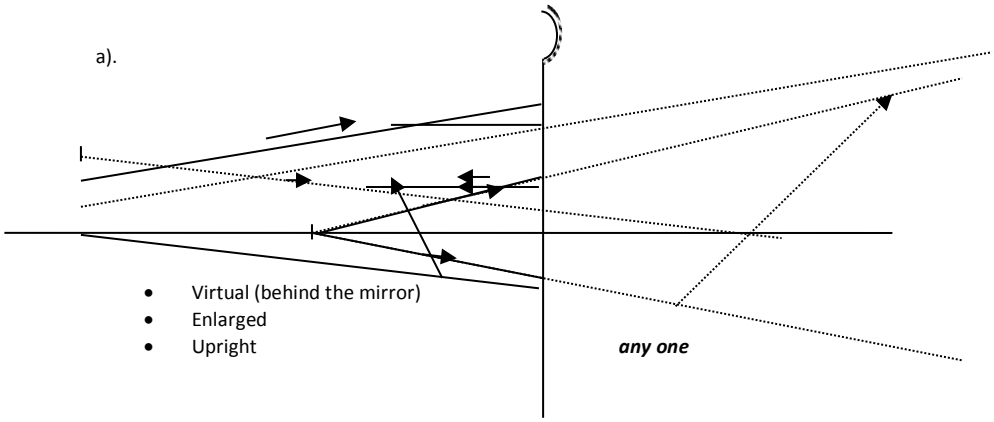
MARKING SCHEME

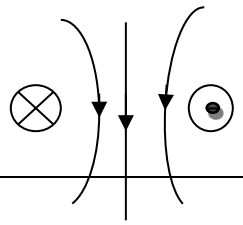
232/2 MARKING SCHEME
PHYSICS PAPER 2
MARCH/ APRIL 2018
TIME: 2 HRS.

Physics Paper 2.

SECTION A (25 MARKS)

1.		2 mks
2.	V=S/t S = V X t =330m/s X2S **= 660 m** **Narrow field** **Wider field**	2 mks

3.	a).  • Virtual (behind the mirror) • Enlarged • Upright ***any one***	2 mks 1mk
4.	$m = \frac{v}{u} \Rightarrow v = 3u$ $\qquad f = \frac{uv}{u+v} = \frac{1200}{80}$ $u + v = 80cm$ **= 15cm** **U = 20cm**	3mks
5.	i). light must be travelling from **optically** denser medium to an **optically** less dense medium. √1 ii). The angle of incidence in the **optically** denser medium must exceed a certain critical angle. √1	2mks
6.	${}_a n_g = \frac{\sin 90^o}{\sin 42^o}$ ${}_a n_g = \frac{1}{0.669}$ = **1.494**	3mks
7.	*a). X-rays* — **Kill cancerous cells** *b). Infra red* — **Source of warmth, burglar alarms** *c). Microwaves* — **Cooking, communication,**	3mks 3mks

8.	i) Waves with greater wavelengths are diffrated (spread) readily to cover awider region. ii) Increasing the slit reduces the extent of spread / diffration , waves will pass the slit as straight waves with a slight curvature at the ends.	2mks
9.		2mks
10.	**P**= $\frac{V^2}{R}$ V^2 =18 * 8 =144 V=12V	2mks
11.	-Detecting the shoal of fish -determination of **depth/distance** of the sea	1mk

SECTION B (55 MARKS)

12.	a). when the magnetic flux through a circuit is changed an e.m.f is induced in the circuit which is proportional to the rate of change of the magnetic flux.	1mk
	b). Sound waves from a source set the diaphragm in **vibration** the when coil moves in the magnetic field, an induced e.m.f is produced and the vibrations of the e.m.f closely follow the **vibrations of the moving coil.** An amplifier is then used to increase the amplitude of this current before feeding **into the loudspeaker for conversion back to sound**	3mks
13.	**a). Refractive index is the bending of light owing to change in velocity at the interface.**	1mk

	b i). $n_{1=}\frac{sin\ i}{sin\ r}$ $n_{1=}\frac{sin\ 40}{sin\ 24}$ **=1.5804**	3mks
	b) ii) . $n_{1=}\frac{1}{sin\ C}$ **sin c** $= \frac{1}{1.5803}$ **=**	3mks
	b). iii) . $_1n_{2\,=}\frac{sin\ 24}{sin\ 26}$. $_1n_{2=}\frac{1}{sin\ C}$ **= 0.92784**	2mk
	b) 1v) . **a** $n_{2=}\frac{velocity\ of\ light\ in\ air}{velocity\ of\ light\ in\ medium\ 2}$ **a** n_2 **=** **an**$_1$ **x** $_1n_2$ **=1.5803 x 0.92784** **a** $n_{2=\ 1.4662}$ 1.4662 = $\frac{3\ x10^8}{v\ in\ medium\ 2}$ velocity in medium 2 = $2.0461\ X\ 10^8$ m/s	
14.	**a).** i). Controls the brightness of the spot on the screen. ii). Focuses the electron beam onto the screen	2mks

b). i). $T = timebaseXwavelength$

$T = 20mS/cmX\ 4cm$

= **80m**

$$f = \frac{1}{T} = \frac{1}{80X10^{-3}S}$$

= **200Hz**

3mks

ii) $Voltage = Y - gainXamplitude$

$Voltage = 5V/cmX3cm$

= **15V**

2mks

c).

i) Loud (constructive interference) and soft (destructive interference) sound is heard.

ii) **Maximum amplitude** or **horizontal line**

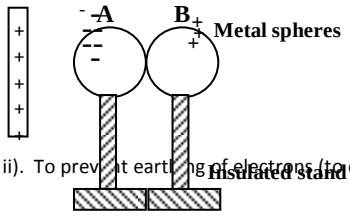
iii) Loud sound through CO.

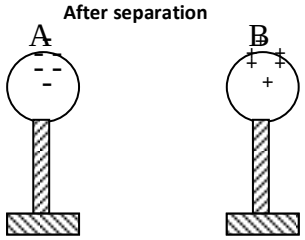
iv). Satisfy the condition of being coherent

- Same speed
- Same or nearly equal amplitudes
- Same frequency

15.

a). i).





2mks

ii). To prevent earthing of electrons (to or from earth).

b).

- ***Nature of dielectric***
- *distance of separation* ***any two***
- area of overlappe

c).

i) Q= CV

= 2 x10^{-6} x6V

=1.2 x10^{-5} C

Substitution of Q =1mk
Calculation of Q =1m

2mks

ii) effective capacitance

$C_T = 2\mu F + 4\mu F$

$= 6\mu F$

2mks

$$V = \frac{Q}{C} = \frac{1.2\times10^{-5}}{6\times10^{-6}} = 2V$$

p.d across each capacitor =2v

d). i) $E = IR + Ir$

$$E = 0.15(8) + 0.15r$$
$$E = 0.08(16) + 0.08r$$

E=1.2 + 0.15r --------i)
E=1.28 + 0.08r -----ii)

2mks

Solving these simultaneously, we have
0.08 = 0.07r

$$r = 1.143\Omega$$

2mks

ii).

$$E = 1.2 + 0.15(1.143)$$
$$E = 1.372V$$

16.

a).

A - Live wire
B - Earthing
C - Neutral

b). to open the shutters in the socket

c).

i). Fuse	**To safeguard against excess current in the circuit**
ii). Earthing	**At zero potential, to prevent one from receiving an electric shock**

d). i).

$$P = (2X\,40W) + 500W + 3000W$$

P = <u>3580W</u>

ii)

$$P = IV$$

$$I = \frac{P}{V} = \frac{3580W}{240V}$$

$$\underline{I = 14.92A}$$

2mks

iii).

$$E = \{(80Wx12hrs) + (500Wx24hrs) + (3000Wx3)\}x20days$$

	= [960+12000+9000]x20days = **<u>21.96kWh</u>**	