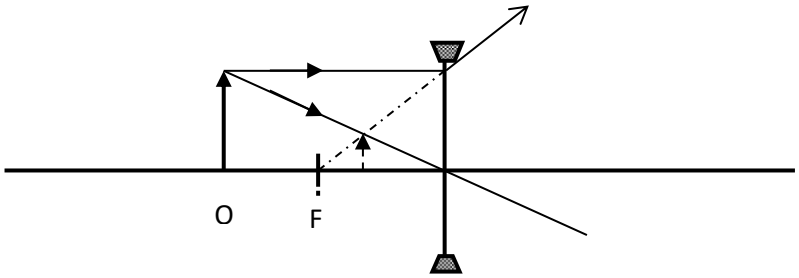
PHYSICS FORM 4 MARKING SCHEME

1. (a) $\frac{0.6}{2} = 0.3$

   f = 20 – 0.3 = 19.7cm

b)



c) i) convex/converging lens produces a real,magnified image.

ii) u+v=100 >>v=100-u

m= v/u

4=$\frac{100-u}{u}$

U=20cm >>v=80cm

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\frac{1}{f} = \frac{1}{80} + \frac{1}{20}$$

f=16cm

2. V=2πrf;

= 2 x 22 x 1.5 x 3;

7

= 28 . 286m/s;

ii) T= Mr2 - mg;

r

=0.45 x 28.29^2 - 0.45 x 10;

1.5

= 235 .60 N;

b) mark on the diagram- horizontal projection to the left

c) i) ω=ΔΘ

Δt;

= 4/10

0.01;

= 0 . 4

0.01

= 40 rad/s;

ii) T=1/f;

ω=2πf

40 =2πf; f=6.36Hz

T=0.1571s;

3. a) When a body is fully or partially immersed in a fluid, it experiences an upthrust equal to the weight of the fluid displaced. ✓1

b) i) weight = mg But m = d x v

$\therefore$ W = d x v x g ✓1

= 800 x $(0.04)^3$ x 10 ✓1

= 0.512N. ✓1

ii) Upthrust = weight of displaced fluid

= d x vol x g✓1

= 1000 x $(0.04)^3$ x 10✓1

= 0.64 N✓1

iii) Tension in the thread = Upthrust – weight of block

= 0.64 – 0.512✓1

= 0.128N✓1

4. $Pt = M_cC_c\Delta T + M_aC_a\Delta T$√1

180 x 36 = (0.1 x 400 x 12) + (0.2 x C_a x 12) √1

6480 = 480 + 2.4 ha

ha = 6480 – 480 = $\frac{6000}{2.4}$

= 2,500$Jkg^{-1}K^{-1}$√1

5. Pressure acting on the bubble decreases as it moves towards the surface. √1
6. Total capacitance in parallel = 2 + 3 = 5 μF

Effective capacitance = C_T = (5 x 1.5) / (5 + 1.5) = 1.154 μ

Total Charge stored $Q_T = C_TV$ = 10 x 1.154 = 15.54 μF

Charge stored by 1.5 μF Capacitor = total charge = 15.54 μF

7. M.A = L = 3000N = 1.5√1

$\frac{E}{}$ $\frac{}{2000N}$

V.R = $d\frac{E}{}$ = $10\frac{}{M}$ =2√1

$\frac{}{dl}$ 5m $\frac{}{}$

n% = M.A x 100 % = 1.5 x 100%

V.R 2

= 75%√1

8. Supports aquatic life

9. (i)B √1
   (ii) Impulsive force (ft) √1

10. (i) Stationary waves do not transfer energy away from source while progressive waves do. √1

    - Vibrations of particles at points between successive nodes are in phase√1 while in progressive, phases of particles near each other are different.

    - In stationary waves, distance between successive nodes or anti nodes is $\lambda/2$ while in progressive waves distance between successive troughs or crests is λ

    (ii) – Sound waves require material medium while e.m waves don't√1

    - Sound waves are longitudinal while e.m waves are transverse. √1

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