**PHYSICS F 4 M/S PP2**

1. Rectilinear propagation. 🗸¹

4. (a) Unlike poles attract, like poles repel 🗸¹

 (b) The keepers become magnetized thus neutralizing 🗸 the pole; this reduces

repulsion at the poles 🗸 thus helping in retention of magnetism.

5. It has a wider field of view than that of a plane mirror. 🗸

|  |  |
| --- | --- |
|  |  |

6

 **Total resistance R= 6+6+0.5Ω=12.5Ω**

 **Current I= V/R=3.0/12.5=0.24A**

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 **7. When the terminals of the heater are at a p.d of 240V and connected to an alternating current of frequency 50Hz, it converts 2500J of electrical energy to 2500 J of heat energy per second.**

**8. TV waves----microwaves—blue light---Ultra-violet—gamma rays.**

**9. Transformer uses a.c only while induction coil uses d.c**

**Transformer produces a humming sound while induction coil is quiet**

|  |  |  |  |
| --- | --- | --- | --- |
| 10,  | (a) | Transverse | Longitudinal wave |

|  |  |  |  |
| --- | --- | --- | --- |
|  | 1. | Displacement of particles in the wave is perpendicular to the direction of wave motion. | - Displacement of particles in the  wave is parallel to the direction  of wave motion. |
|  | 2. | Requires no medium for propagation. | - Requires a material medium for  propagation. |
|  | 3. | Can be mechanical or electromagnetic in nature. | - Purely mechanical wave. |

 Any 1 combination

 (b) 

Hence 

 (c) (i) Can travel for long distances as a beam without getting scattered.

 (ii) It can be reflected by tiny particles like grains hence can defect them. 🗸¹ Any 1

12. P = VI 🗸¹



 = 12.5A🗸¹

 The fuse is not suitable since the appliance is drawing more current than the

fuse rating 🗸¹ the fuse will blow off.

13.  **His car gets charged by friction during the day. He then acts as earth wire when he step on the ground holding the metal handle.**

**SECTION**

**14.** (a) (i) 🗸¹

 

 

 = 60V🗸¹

1. Power input = Power output 🗸¹



 = 1.25A🗸¹

 (iii) 

 = 16.67A 🗸¹

 (iv) Step-down transformer 🗸¹

 (b) (i) - To minimize power loss.

 - Thick cables minimizes resistance.

 (ii)  🗸¹

  🗸¹

  

Total

 Cost 187 × 9.50

 = Ksh.1776.50 🗸¹

1. No of units = 187

Fuel levy 187 

 = 130.90

Standing charge = 200.00

Total charge = 1776.50 + 330.90

 = Ksh.2107.40

15. (a) (i) Increasing the number of turns in the coil.

 (ii) Increasing the size of current.

(iii) Using a soft iron core.

1. Reducing the length of the core.

(b)

Motion

Field

B

A

1. E = IR + Ir

 = 5 × 1.6 + 5r --- (i)

E = 3.2 × 2.8 + 3.2r ---- (ii)

Hence

 5 × 1.6 + 5r = 3.2 × 2.8 × 3.2r

1.8r = 8.96 + 8

 1.8r = 0.96

 r = 

 E = 5 × 1.6 + 5 × 0.53

 = 8 + 2.65

 = 10.65V

(d)  🗸①

 🗸①

 = 

 = 63.6 × 10ˉ²m

 or

 63.6cm 🗸①

 (e) P.d across R = p.d across 10Ω resistor. 🗸①

 V + IR = 2 × 10 = 20V 🗸①

16.  **(a) (i) Long sight**

(ii) **--eye ball being too long**

**--focal length too short**

b. **It is the ability of the eye to focus the image on the retina**

c. (i). **1/u + 1/v = 1/f**

**1/u + 1/45=1/15**

 **1/u =1/15-1/45 =2/45**

 **U=45/2= 22.5cm**

 **Apparent depth =22.5cm**

**(ii) n= real depth/apparent depth**

 **real depth=n x AD**

 **= 4/3 x 45/2**

 **=15x2**

 **=30cm.**

 **gnl =1.4/1.6 =sin 450/sinr**

 **sinr =1.6sin45/1.4**

 **=0.742**

 **r = 53.0**

d. (i). **i = 450**

17. (a) (i) Increasing the surface area of the liquid. 🗸①

 (ii) Reducing the pressure on the liquid surface. 🗸①

1. Heat gained by water = Heat lost by metal block

Mw Cw Өw = MmCm Өm 🗸①

2 × 4200 × (50 – T1) = 10 × 450 × 70

  🗸①

T1 = 50 – 37.5 = 12.5°C 🗸①

1. Water has a high heat capacity hence can absorb a lot of heat 🗸①

(d) (i) Increasing the pressure on the ice. 🗸①

 (ii) Adding impurities e.g. salt 🗸①

1. As ether evaporates, it extra it’s the latent heat of vaporization from its surroundings

hence the water is cooled. 🗸①

|  |  |  |
| --- | --- | --- |
| (g) | Heat | Temperature |
|  | - Form of energy which flows  from a hotter to a cooler part of an object | - Degree of hotness or coldness  of an object measured on a given scale. |
|  | - Measured in joules | - Measured in Kelvin or °C. |
|  | - Measured using a calorimeter | - Measured using a thermometer. |

 Any two

1. Last…
2. **Up motion h1 = 40t – 5t2** ✓**1**

**Down motion h2 = 5t2**

**But h1 + h2 = 100m**

**100 = 5t2 + -5t2 + 40t✓1**

**t =** $\frac{100}{40}$ **= 2.5 seconds ✓1**

(ii) **hi = 40t – 5t2**

 **= (40 x 2.2) – 5 (2.5)2✓1**

 **= 100 – 31.25**

 **= 68.75m✓1 from the ground**

(b)

(i) **w = 2πf**

 **= 2 x**$\frac{22}{7} x 6$**✓**

 **= 37.7 radis✓**

1. **a = rw2**

 **= 0.6 x (37.72) ✓**

 **= 853.42 radis✓**

(iii)  **F = ma**

 **= 0.045 x 853.42✓**

 **= 38.4N ✓**

(iv) **v = rw**

 **= 0.6 x 37.7**

 **= 22.62 m/s ✓**