MARKING GUIDE $X/30$

Name: …… Date ……

G H S S.2 PHYSICS TEST ONE 03/04/2020

SUBTOPIC: PINHOLE CAMERA

SECTION A

1. When a pin-hole camera is moved nearer an object, the size of the image
   A. remains the same B. becomes smaller
   (C) becomes larger D. becomes diminished

2. In a pin-hole camera, sharper and taller images are obtained by
   A. widening the hole and moving the object farther
   (B) narrowing the hole and moving the object nearer
   C. using a longer camera with a wider hole
   D. using a shorter camera with a narrower hole

3. A man 1.75 m tall stands at a distance of 7.0 m from the pinhole of pinhole camera. If the film is 0.20 m behind the pinhole, find the length of the image of the man formed on then film.
   A. 8.75 m B. 4.00 m C. 0.80 m (D) 0.05 m
   $\frac{h_I}{h_o} = \frac{V}{U}$, $\frac{h_I}{1.75} = \frac{0.2}{7}$, $h_I = 0.05m$

4. An object 6cm high is placed 24cm from a tiny hole in a pinhole camera. If the distance from the pinhole to the screen is 8cm, find then size of the image on the screen.
   A. 0.2cm (B) 2.0cm C. 18.0cm D. 32.0cm
   $\frac{h_I}{h_o} = \frac{V}{U}$, $\frac{h_I}{6} = \frac{8}{24}$, $h_I = 2cm$

5. A man 1.75m tall stands at a distance of 7.0m from the pinhole of a pinhole camera. If the film is 0.20m behind the pinhole, find the length of the image of the man formed on the screen.
   A. 8.75m B. 4.00m C. 0.80m (D) 0.05m

6. Which of the following is false?
   (A) Pinhole camera produces an erect image.
   B. Pinhole Camera produces a shadow
   C. Pinhole Camera produces an image
   D. Pinhole Camera produces an inverted image

7. Pinhole camera produces an?
   A. An erect and small image B. an erect and enlarged image
   (C) an Inverted and small image D. An inverted and enlarged image

8. What happens to the image produced by a pinhole camera when you move the back wall farther from the pinhole? It becomes
   (A) larger and fainter. B. smaller and fainter.
   C. larger and brighter. D. smaller and brighter.

9. Who was one of the first persons to make pinhole photographs?
   A. Niepce B. Talbot (C) Brewster D. Grepstad

10. What animal uses a pinhole to see?
    A. Crab B. Lobstah C. Shrimp (D) Nautilus

SECTION B

11. Define the term magnification as used in Physics and state its SI units. (2marks)
    Magnification is the ratio of the height of the image to the height of the object.
    Magnification has no units

    (b) An object of height 5 cm is placed 20 cm from a pin-hole camera which is 5 cm long. Calculate;

(i) the magnification. (2marks)

$$M = \frac{V}{U}$$

$$M = \frac{5}{20}$$

$$M = 0.25$$

(ii) the height of the image formed. (2marks)

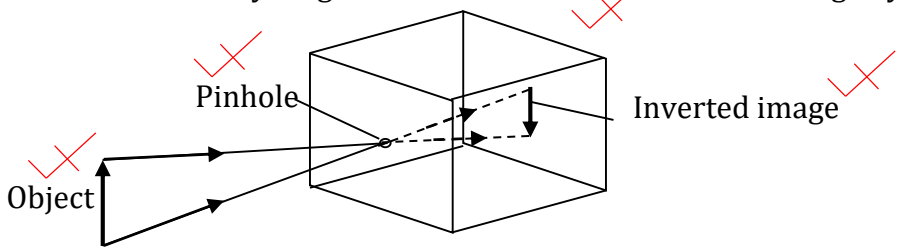
$$M = \frac{h_I}{h_o}$$

$$0.25 = \frac{h_I}{5}$$

$$h_I = 1.25\text{cm}$$

12. (a) An object of height 4 cm is placed 5 cm away from a pin-hole camera. The screen is 7 cm from the pinhole.

(i) Draw a scale a ray diagram to show the formation of an image by a pinhole camera. (2marks)



(ii) What's the nature of the image? (2marks)

Real an inverted

(iii) Find the magnification. (2marks)

$$M = \frac{V}{U}$$

$$M = \frac{7}{5}$$

$$M = 1.4\text{cm}$$

(iv) Calculate the height of the image formed by the pinhole camera. (2marks)

$$M = \frac{h_I}{h_o}$$

$$1.4 = \frac{h_I}{4}$$

$$h_I = 5.6\text{cm}$$

(b) Explain what happens to the image if;

(i) the pinhole is made larger. (3marks)

When the pinhole is made larger, the image becomes blurred (although brighter because a large hole allows in more light). This is because a wider hole is equivalent to many pinholes, each forming its own image in a slightly different position. So a collection of all these images is one blurred image.

(ii) very small. (3marks)

the smaller the pinhole, the sharper and the taller the image but only up to a point, because the smaller the pinhole the greater the visible effect of diffraction by the edges of the hole on the light waves.

END.