**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM NO: \_\_\_\_\_\_\_\_\_\_\_\_CLASS:\_\_\_\_\_\_\_\_\_\_**

**DATE: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ SIGN: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_TARGET\_\_\_\_\_\_\_\_\_**

**FORM FOUR**

**PHYSICS**

**MID-TERM EXAM**

**TERM 1, 2024**

**INSTRUCTIONS: (Answer all the questions) TIME: (11/2 HOURS)**

1. Define the following terms as used in curved lens.

i) Principal focus (F). (1mk)

ii) Focal length (f) (1mk)

1. Distinguish between a real and a virtual image. (2mk)
2. A boy scout wanted to light up his match stick using a lens. State the type of lens he should use and explain how? (3mk)
3. Under what conditions does a converging lens form

(i) Real images (1mk)

(ii) Virtual images (1mk)

1. Sketch on a diagram to illustrate how a convex lens is used as a magnifying glass. (3mks)
2. Show that the linear magnification M of a convex lens is given by

 (2mks)

1. You are provided with a metre rule, distant object, concave mirror and a white screen. Briefly describe how you can estimate the focal length of the focal length of the convex lens. (3mks)
2. Figure shows an object **‘O’** in front of a lens.

**F**

**F**

**2F**

**2F**

**O**

1. By drawing appropriate rays on the same figure state the position of the image formed (3mk)

(ii) Explain the adjustments you would make on the position of the object above in order to obtain a real magnified image (2mk)

1. Define the term “accommodation” as applied to human eye. (2mk)
2. Define angular displacement. (1mk)
3. Define a radian (1mk)
4. **Define** angular velocity and state its **SI** unit (2mk)
5. Explain why bodies in circular motion undergo acceleration even when their speed is constant. (2mk)
6. The figure below shows a container with small holes at the bottom in which wet clothes have been put.

**Holes**

**Container**

**Clothes**

When the container is whirled in air at high speed, it is observed that the clothes dry faster. Explain how the rotation of the container causes the clothes to dry. (3mk)

1. A particle revolves at 4 HZ in a circle of radius 7cm. calculate its.
2. Linear speed. 2mks
3. Angular velocity. 2mks
4. A 150g mass tied to a string is being whirled in a vertical circle of radius 30cm with uniform speed. At the lowest position, the tension in the string is 9.5N. calculate,
5. The speed of the mass. 3mks
6. The tension in the string when the mass is at the uppermost position of the circular path. (take g = 10m/s2) 3mks

1. A lead shot of mass 40g is tied to a string of length 70cm. It is swung vertically at 5 revolutions per second. Determine;

(i) Periodic time. (2mks)

(ii) Angular velocity (2mks)

(iii) Linear velocity (2mks)

(iv) Maximum tension in the string. (3mks)