

END OF TERM I EXAMINATIONS 2025

S.5 Physics Paper 2

Time: 1 hour 30 minutes

INSTRUCTIONS: Attempt any **three** questions.

SECTION A

- 1.(a) S.1 students in your school were given an assignment in which they have been asked to make a report on laws of reflection, formation of virtual image by a plane mirror and how this image can be located using optical pins. These students have approached you for assistance. Help them to make the report. (04 marks)
- (b) A ray of light is incident on a plane mirror. The plane mirror is then turned about a fixed position through an angle, α keeping the direction of the incident ray constant. If the reflected ray turns through an angle, β , find the relationship between α and β . (04 marks)
- (c) A child 1.4 m tall and her eyes are 10 cm below the top of her head would like to buy a plane mirror which can enable her see the whole of her body when the mirror fixed on a vertical wall while standing vertically. She is bothered by the minimum length of the mirror which can serve the purpose and how far from the ground is the top of the mirror. Help the child to solve the problem. (06 marks)
- (d) A farmer wishes to fix a solar panel in space that can run a water pump which can pump water for his animals from underground. He has been advised that before he fixes it, he needs to first determine the angle of elevation of the incident solar energy from the sun. Help the farmer design a device which can be used and show him how it operates. (06 marks)
2. (a) (i) Draw a ray diagram to show the formation of real image of a real finite object by a converging mirror. (02 marks)
- (ii) Show that the radius of curvature of a concave mirror is twice its focal length. (05 marks)
- (b) (i) With the aid of ray diagram, differentiate between regular and diffuse reflection. (04 marks)
- (ii) Show that if two plane mirrors are inclined at an angle, θ to each other, then the total deviation of light produced is 2θ . (04 marks)
- (c) Explain with the aid of a ray diagram the term caustic curve. (03 marks)

END