

- (iii) A green with red flowers when viewed in a red light will appear;
- A. Completely red
 - B. Completely yellow
 - C. Completely green
 - D. Yellow with red flowers
 - E. Green with red flowers.
- (iv) Which of the following is an example of Fundamental force;
- A. Frictional force
 - B. Torsional force
 - C. Stretching force
 - D. Gravitational force
 - E. Viscous.
- (v) A constant wire of diameter 0.40mm has resistance of 10Ω . What is the length if the resistivity of wire is 5.0×10^{-7} ?
- A. 0.39m
 - B. 2.51m
 - C. 3.62m
 - D. 0.82m
 - E. 5.41m
- (vi) Lenz's law can be used to predict the;
- A. Magnitude of back e.m.f in circuit
 - B. Magnitude of induced current in a circuit
 - C. Direction of applied e.m.f across circuit
 - D. Direction of induced e.m.f or e.m.f in a circuit
 - E. Size of magnetic flux in a coil.
- (vii) The cost of electricity for a 2000W electric fire used for 10:30 hours at a rate of Tsh. 8.00 per unit is;
- A. Shs 160
 - B. Shs 80
 - C. Shs 168
 - D. Shs 1600
 - E. Shs 3200

- (viii) Which of the following electromagnetic waves is used to detect the flaws and defects in steel plates;
- A. Infrared waves
 - B. Ultraviolet waves
 - C. U – rays
 - D. Gamma rays
 - E. Microwaves.
- (ix) The Phenomenon observed when vibrating system is interfered is;
- A. Interference
 - B. Polarization
 - C. Diffraction
 - D. Reflection
 - E. Resonance.
- (x) The condition of semi-conductor can be enhanced by;
- A. Change the pressure or removal of impurities
 - B. Increase of Temperature and impurities
 - C. Increase of external resistance
 - D. Addition of impurities
 - E. Reducing temperature.

2. Match the items in list A with response in list B by writing the letter of the correct response;

LIST A	LIST B
(i) Passenger feel loss of balance	A. Law of Inertia
(ii) Motion under the influence of gravity	B. Newton's 2 nd law
(iii) A body moving with constant velocity	C. Newton's 3 rd law
(iv) Kilogram metre per seconds	D. Acceleration
(v) Rocket propulsion	E. Free fall motion
	F. Momentum
	G. Impulse
	H. Zero acceleration.

SECTION B

3. (a) (i) Define the Term Upthrust.
(ii) List two conditions for a body to float.
- (b) (i) Draw a well labelled diagram of Hydrometer.
(ii) Why do graduations of Hydrometer start with small number at the top and large number at the bottom of the stem?
4. (a) (i) List three (3) rules used to locate image in curved mirror.
(ii) Give two (2) similarities and two (2) differences between an eye and a lens.
- (b) Briefly explain why principal focus of the converging mirror is real and that of diverging mirror is virtual.
- (c) A pin at the bottom of the vessel 16cm deep when the vessel is filled with water, the pin appears to rise when viewed from above. Find the apparent depth.
5. (a) Explain briefly each of the following basing on the production of x-rays in x-ray tube;
(i) Why tungsten is embedded in copper?
(ii) Why the tube should be evacuated?
(iii) Why the tube should be shielded?
(iv) What would happen if the tube is not evacuated?
(v) Why is it necessary to have oil cooling the anode?
- (b) Write down the uses of x-rays in;
(i) Hospitals.
(ii) Agriculture.
6. (a) (i) List three (3) effects of an electric current.
(ii) Sketch the lines of force between repulsive and attractive poles of two bar magnets.
- (b) (i) Mention two (2) applications of electromagnets.
(ii) Illustrate how right hand grip rule is used to determine electric current and magnetic field directions.
7. (a) Define the following terms;
(i) Earthquake.
(ii) Tides.
- (b) (i) Give two (2) difference between Jovian and Terrestrial planets.
(ii) Mention three (3) uses of satellite.

- (c) Mention four (4) effects of global warming.
- 8. (a) Briefly explain why;
 - (i) Moon is termed as silent satellite.
 - (ii) An aeroplane sometimes leaves a sonic boom behind.
- (b) (i) Define Echo.
 - (ii) Two boys A and B stand 85m and 340m respectively from the tall building. B fires a gun, what is the time interval between the two reports heard by B?

SECTION C

- 9. (a) Define the terms;
 - (i) P-type semi-conductor.
 - (ii) N-type semi-conductor.
- (b) (i) List down four types of diodes.
 - (ii) List down two (2) applications of transistors.
- (c) Distinguish between Analogue signals and Digital signals.
- (d) What is amplifier as used in electronics?
- 10. (a) State laws of electromagnetic induction.
- (b) Mention four (4) applications of electromagnetic inductions.
- (c) A step up transformer has 10000 turns in the secondary coil when connected to 12V a.c supply. Calculate the voltage across the secondary coil.
- 11. (a) Define the following terms;
 - (i) Shunt.
 - (ii) Multiplier.
- (b) Mention three factors that determine the sensitivity of a galvanometer.
- (c) A moving coil galvanometer of internal resistance 100Ω gives full-scale deflection for a current of 10mA. How can you convert the device to;
 - (i) A voltmeter reading up to 5V.
 - (ii) An ammeter reading up to 10A.
