

PHYSICS GROUP WORK L5(SOD, NIT AND MMP)

SECTION A: 55MARKS

Q1. List the two types of physical quantities. **(2 marks)**

Q2. Give the instruments used for measuring the following physical quantities:

a) Mass **(1 mark)**

b) Force **(1 mark)**

Q3. Enumerate three (3) Characteristics of real image given by concave mirror. **(3 marks)**

Q4. List three (3) advantages of solar energy. **(3 marks)**

Q5. Fill the table below:

Quantity	S.I Unit name	Symbol of unit
Time		
Force		
Length		
Temperature		
Volume		

/ 5MARKS

Q6. State the two laws of reflection. **(2 marks)**

Q7. Given the expression of refractive index of a transparent medium

$$n = \frac{c}{v},$$

, what C and V stand for? **(2 marks)**

Q8. Classify the physical quantities among scalar or vector quantities:
Given physical quantities: Force, Temperature, Weight, Mass and Velocity.
(5 marks)

Q9. A. What do you understand by random error? **(1 mark)**

B. how can you reduce random error? **(1 mark)**

C. In an experiment, it is found that the experimental value is very close to actual value, hence the experimental value is called **(1 mark)**

i. Precise

ii. Accurate

iii. Suitable

iv. Mean

- D. How can you correct systematic errors? **(1 mark)**
- Q10.** What is meant by the term “dimension” of a physical quantity? **(2 marks)**
- Q11.** A) Explain why the net charge on the capacitor is zero. **(2 marks)**
B) Give the S.I unit of capacitance. **(1 mark)**
- Q12.** Differentiate elastic collision and inelastic collision. **(2 marks)**
- Q13.** A page of a book has width of 14.5 cm and length of 21.4 cm. What is its area in square millimeter? **(4 marks)**
- Q14.** Suppose you take a trip that covers 240 km and takes 4 hours. in meter per second.
a) Convert 20km into m **(1 mark)**
b) Convert 4h into s **(1 mark)**
c) Determine Your average speed. **(2 marks)**
- Q15.** Calculate the mass of an object whose potential energy is 2kJ from the top of height of 2m to the ground to ($g = 10\text{N/kg}$). **(4 marks)**
- Q16.** A charge of $4\mu\text{C}$ is placed in a vacuum. Determine the electric field intensity at a point P at a distance of 20cm from the charge, ($k = 9 \times 10^9$). **(4 marks)**
- Q17.** Two capacitors of $C_1 = 6\mu\text{F}$ and $C_2 = 3\mu\text{F}$ are connected in series with a cell of 12V Calculate the equivalent capacitance. **(4 marks)**

SECTION B: Attempt only 3 questions in section B (30 marks)

- 18.** Arrange the following forms of energy as renewable or non-renewable energies: **(10 marks)**
- a) Biogas
 - b) Natural gas
 - c) Biomass
 - d) Coal
 - e) Wind energy
 - f) Solar energy
 - g) Crude oil (Petroleum)
 - h) nuclear energy
 - i) Geothermal energy
 - j) Fossil fuel

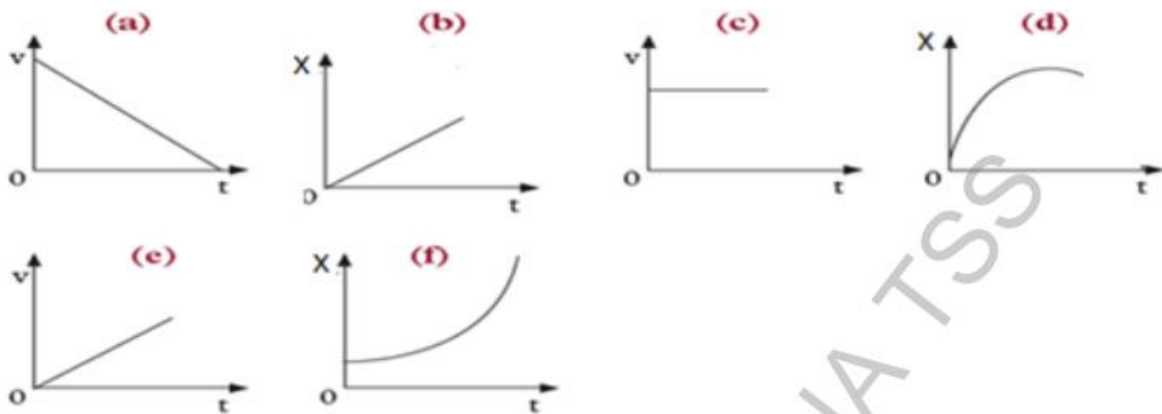
Q19. A bus changes its speed from 180 m/s to rest in 10 s. Calculate the:

- i) Acceleration of the bus **(3 marks)**
ii) Displacement of the bus **(5 marks)**
- The obtained value on a.i) is positive or negative? Explain why? **(2 marks)**

Q20. A. The sketches in the Figures below represent different types of motion of

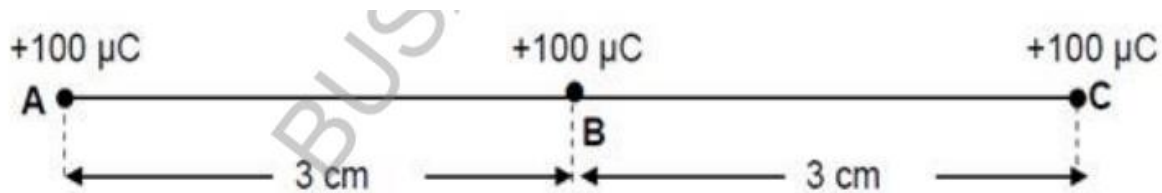
bodies. Organize each graph in its corresponding type of motion.

(6 marks)



B. A tractor accelerates from rest to a velocity of 20 m/s in 5 s. Calculate the acceleration of the tractor in that time. **(4 marks)**

Q21. Three $+100 \mu\text{C}$ point charges, **A**, **B** and **C**, are equally spaced on a straight line in a vacuum. The charges are a distance of 3 cm from each other as shown in the figure below, ($k = 9 \times 10^9$).



- Calculate the net electrostatic force experienced by point charge C due to charges A and B. **(9 marks)**
- Indicate the direction of net force. **(1 mark)**

Q22. (a) A tree 18 m high is observed with a pinhole camera that is placed 40 m

away. If the camera is 20 cm long, calculate the:

(i) Magnification produced by the pinhole camera. **(4 marks)**

(ii) Height of the image **(4 marks)**

(b) Can the magnification can be negative? yes or No. Justify your answer. **(2 marks)**

SECTION C: Attempt only 1 question in section C (15 marks)

Q23. a) A beam of light traveling in the air, strikes a flat slab of glass (Rectangular block of glass) at an incident angle of 45° . The index of refraction of the glass is **1.5**. By using a figure, interpret the relation between incident ray and emergent ray. **(6 marks)**

b) What would happen to the refracted ray when the incident ray enters in the glass? **(1 mark)**

c) At the moment of entering glass, what is the angle of refraction (refractive index of air is **1.00**)? **(5 marks)**

d) What would happen to the angle of refraction when the ray leaving the glass to air? **(3marks)**

Q24. The table below shows the displacement of a cyclist on the way of school:

Displacement (m)	0	80	160	240	240	280
Time (s)	0	20	40	60	80	100

a) Draw a graph of displacement $d = f(t)$ to reflect this information. Plot the time in seconds on the x-axis and choose a scale of 1cm to represent 10s, plot the displacement in meters on the y-axis and choose a scale of 1cm to represent 50m. **(6Marks)**

b) From your graph drown in a), deduce the formula of the speed of the cyclist in the interval (0 – 60 s). **(1 mark)**

c) For the first 60s, determine the average speed. **(3 marks)**

d) What is the information reflected by the graph in the interval (60s - 80s)? **(1mark)**

e) The last 20s, determine the average speed. **(4 marks)**

END!!!!!!!!!!!!!!