CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)

FORM TWO PRE – NATIONAL EXAMINATION AUG 2025

PHYSICS
MARKING SCHEME

Qn1.

i	**ii**	**Iii**	**Iv**	**v**	**vi**	**vii**	**viii**	**ix**	**x**
C	A	B	A	C	D	D	C	B	C

Marks 10 Qn2.

I	Ii	Iii	iv	v
F	E	G	A	I

Marks 05

SECTION B (70)

3(a) Materials

- Magnetically soft : iron 03 marks

- Magnetically hard : steel, cobalt, nickel Properties

- Soft: easily magnetized and demagnetized 02 marks

- Hard: retain magnetism for a long time

(b) Applications of magnets (any 5):

i. In electric motors

ii. In speakers and microphones 05Marks

iii. In magnetic compasses

iv. In magnetic door locks

4 (a) Purpose of construction in a **clinical thermometer**:

- To measure body temperature accurately
- Has a constriction to prevent mercury from falling back quickly after use 05 marks

(b) Convert 373 K to Fahrenheit (°F):

- First to Celsius: 373 − 273 = 100°C 05 Marks

- Then: °F = (9/5 × 100) + 32 = 212°F

5 (a) **Due to inertia** the body tends to stay in motion even when the car stops, causing the passenger to lurch forward. Marks 3

b) Solution (Conservation of momentum)

Initial momentum = (6 × 0.8) + (2 × 0) = 4.8 kgm/s 07 mark

Total mass = 6 + 2 = 8 kg

Final velocity (V) = Total momentum / Total mass = 4.8 / 8 = 0.6 m/s

6(a) (diagrams) 01 marks

- Distance is total path covered (scalar).

- Displacement is shortest path between two points (vector). 03 Marks (b)

Draw velocity-time graph 01 marks

- Accelerate from 0 to 80 m/s in 20s (straight line up).

- Maintain 80 m/s for 2 min (horizontal line).

- Decelerate to 0 in 40 s (line sloping down). 06 Mark s

-Distance = area under the graph.

7 (a): i) Mechanical Advantage (MA)

Is the ratio of weight to the effort applied 01mark

MA = Load / Effort (no unit)

ii). Velocity Ratio (VR)

Is the ratio of Effort distance to the load distance 01 mark

VR = Distance moved by effort / Distance moved by load (no unit)

iii) Efficiency (η or e)

η = (MA / VR) × 100% or (Useful work / Input work) × 100 01mark

7 (b) Calculation

- VR = 5

- Work input = 600 J 02 marks

- Load = 800 N

- Distance moved by load = 0.5 m

→ Work output = Load × Distance = 800 × 0.5 = 400 J

→ Efficiency = (400 / 600) × 100 = 66.7% 03 marks

→ MA = Load / Effort

Effort = Work input / Effort distance = 600 / (0.5 × 5) = 240 N

→ MA = 800 / 240 ≈ 3.33 02 mark

8(a) Why are luggage compartments located at the bottom of a bus? Luggage compartments are located at the bottom of a bus to

Lower the center of gravity, increasing stability. 05 marks Prevent luggage from blocking passenger space.

Allow for easier loading and unloading from the ground level.

b) Answer:

Moment = Force × Distance from pivot

Distance = 30 cm = 0.3 m 05 marks

Moment = 20 N × 0.3 m = 6 Nm

9 (a) i) Solar energy is renewable and free, unlike petrol which is a non-renewable fossil fuel.

ii) Solar cars are environmentally friendly as they do not emit harmful gases 05 marks

(b) i) Risk of harmful gas emissions such as hydrogen sulphide.

ii) Possibility of ground instability and earthquakes. 05 marks

iii). High underground temperatures may pose fire or explosion risks.

SECTION C (15)

10 (a) Parallel connection is best because 02 marks

-Each bulb works independently. If one goes off, others stay on.

-All bulbs receive the same voltage. 03 marks

-Bulbs glow at full brightness.

(b) Diagram: 06 marks

Dry cell: Power source. Switch:
Controls current flow.
Lamp: Converts electrical energy to light. 04 Marks
Ammeter: Measures current in amperes.
Voltmeter: Measures voltage across components.