

SENIOR FIVE PHYSICS PAPER 1 TEST

DURATION: 1hour

INSTRUCTIONS

Attempt two questions picking one from each section

SECTION A

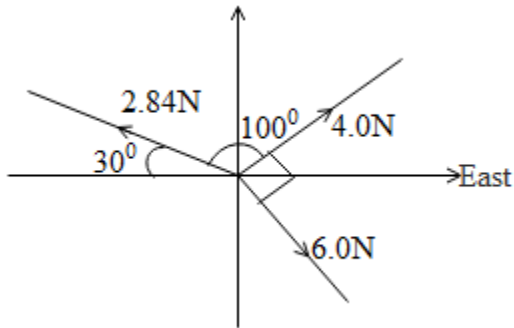
- 1 a i. Define dimensions and dimensions of a physical quantity 02marks
ii. Find the dimensions of force 04marks

- b Given that the velocity v of a wave on stretching the string depends on the mass of the unit length $\frac{m}{l}$ of the string and tension T in the string.

$$v = kT^x \left(\frac{m}{l} \right)^y, \text{ k is a constant. Find the value of x and y}$$

06marks

- c Define resultant force 01mark
Forces of 2.84N, 4.0N and 6.0N act on a particle of mass 5.0kg as shown



04marks

03marks

Find the;

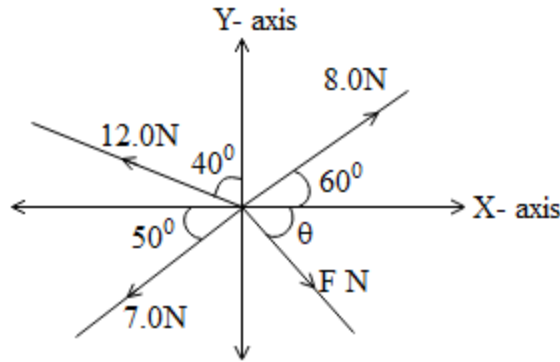
- a. Resultant force
b. Acceleration of the particle.

- 2 a Distinguish between fundamental and derived quantities giving four examples of each 04marks

Given $(p - a) = \rho g(h - b) + \frac{1}{2} \rho(v^2 - d)$, p = pressure, h = height, v = velocity. Find the dimensions of a and b

05marks

b



If the resultant force is zero. Find the

- | | | |
|---|---|---------|
| | i. Value of F | 04marks |
| | ii. The angle θ | 02marks |
| c | i. Define gravity and free fall | 02marks |
| | ii. Describe with velocity – time graph the motion of a body projected vertically upwards | 03marks |

SECTION B

- | | | | |
|---|---|---|---------|
| 3 | a | i. Define fixed point | 01mark |
| | | ii. List two examples of such points | 02marks |
| | b | Explain briefly how the upper fixed point can be calibrated | 04marks |
| | c | i. Describe how a constant volume gas thermometer works | 06marks |
| | | ii. List two corrections made on it to improve its accuracy | 02marks |
| | | iii. Explain why this thermometer is used to calibrate others | 02marks |
| | d | If a wire has a resistance of 35Ω at the triple point of water, find its resistance at 60°C . | 03marks |
| 4 | a | i. Define a thermometric property | 01mark |
| | | ii. List four examples of thermometric property | 02marks |
| | | iii. List four desirable properties of a thermometric property | 02marks |
| | b | The resistance R_θ of a wire varies with temperature θ as follow
$R_\theta = R_0(8000\alpha\theta - \alpha\theta^2)$ Given that $\alpha = \frac{1}{100}$. Find the temperature corresponding to 400°C on this gas scale and comment on your answer. | 06marks |
| | c | i. Describe how a thermocouple works | 06marks |
| | | ii. Explain why a thermocouple measures rapidly varying temperature | 03marks |

END