Practice Question Set For A-Level
Subject : Physics
Paper-3 Topic: Section A(Practical Skills Set-3)

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Name of the Student:_____
Max. Marks : 26 Marks **Time : 26 Minutes**

Mark Schemes

Q1.

(a) brightness (or apparent magnitude) of star from a distance of 10 pc **(1)**

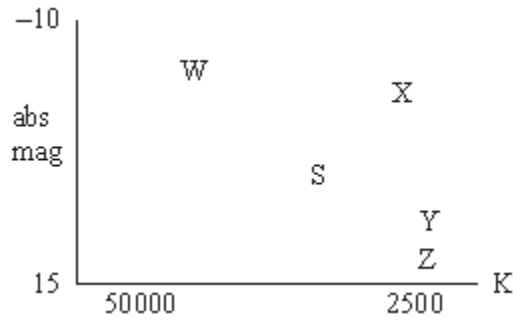
1

(b) (i) temperature from 50000 K to 2500 K **(1)**
absolute magnitude from +15 to –10 **(1)**

(ii) S at 6000 K, and abs mag 5 **(1)**

(iii) W above and to left of S **(1)**
X above and to right of S **(1)**
Y below and to right of S **(1)**
Z below and to right of S **(1)**

7



[8]

Q2.

(a) (use of $m - M = 5 \log(d/10)$ gives)
$3.54 - (-20.62) = 5 \log (d/10)$ **(1)**

$d = 6.7(9) \times 10^5$pc **(1)**

2

(b) use of $\frac{\Delta\lambda}{\lambda} = -\frac{v}{c}$ **(1)**

$$\Delta\lambda = -\frac{0.21121 \times 105 \times 10^3}{3.0 \times 10^8} = -7(.4) \times 10^{-5}$$

$$\lambda' = 0.21121 - 7(.4) \times 10^{-5} = 0.21114m$$ **(1)**

(allow C.E. for incorrect value of Δλ)

2

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(c) $t\left(=\frac{d}{v}\right) = \frac{6.79 \times 10^5 \times 3.08 \times 10^{16}}{105 \times 10^3}$ **(1)**

$= 2.0 \times 10^{17}$s **(1)**

(1.99×10^{17}s)

(allow C.E. for value of d from (a))

2

[6]

Q3.

(a) (i) circuit diagram to show:
wire, ammeter, battery, (variable resistor) and switch in series **(1)**
[or potentiometer with ammeter in correct position]
voltmeter across the wire **(1)**

(ii) (method: constant length of wire)
measure length (of wire) **(1)**
measure diameter (of wire) **(1)**
measure voltage (across) and current (through wire) **(1)**
vary resistor to obtain different voltage and current **(1)**
alternative
[(method: variable length of wire)
measure length (each time) **(1)**
measure diameter **(1)**
(for full length of wire) measure voltage and current **(1)**
voltmeter to shorter lengths, measure voltage (and current) **(1)**]

(iii) (use of) $\rho = \frac{RA}{l}$ (to calculate ρ) **(1)** (for either method)
calculate A from (πr^2) **(1)** (for either method)
(method: constant length of wire)
determine $R\left(=\frac{V}{I}\right)$ for (one) length **(1)**
repeat readings (for same length and) take mean of ρ or R **(1)**
[or plot graph of V vs I to give mean R **(1)**
or gradien = $\frac{\rho}{A}$ **(1)**]
alternative
[(method: variable length of wire)
determine $R\left(=\frac{V}{I}\right)$ for each length **(1)**
calculate ρ for each length and take mean **(1)**
[or graph of R vs l **(1)** with correct gradient **(1)**]

10

(b) (use of $R = \frac{\rho l}{A}$ gives) $\frac{2.0}{4.0} = \frac{1.1 \times 10^{-7} l}{7.8 \times 10^{-9}}$ **(1)**

$l = 0.035$ m **(1)**

2

[12]

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