**Section Two: Problem-solving** **50% (90 Marks)**

This section has **seven (7)** questions. You must answer **all** questions. Write your answers in the space provided. Suggested working time for this section is 90 minutes.

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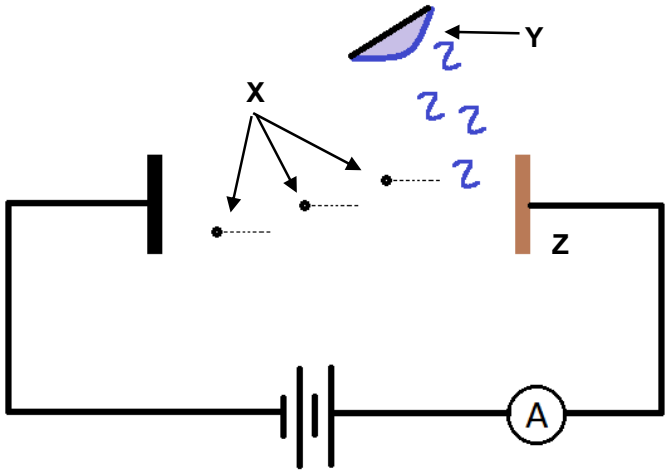
**Question 14** **(13 marks)**

The equipment below is used in an experiment to test the particle nature of light.




(a) The part "Y" is the monochromatic light. Name and describe the function of the parts labelled "X" and "Z" (4 mark)

| Label | Name | Description of function/behaviour |
|---|---|---|
| X | | |
| Z | | |

(b) Describe what the "work function" means in the context of this experiment. (2 marks)

(c) To test for the particle nature of light, the light source is monochromatic (i.e.: consisting of a single colour). If the frequency of the light is decreased, photocurrent will halt. Explain how this observation supports the particle model of light: (3 marks)

(d) Calculate the minimum voltage required between the two plates to ensure the ammeter detects zero current when the wavelength of the incident light is 345 nm and the work function is 1.50 eV (i.e. find the stopping voltage). (4 marks)

Answer: _____ V

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