2.

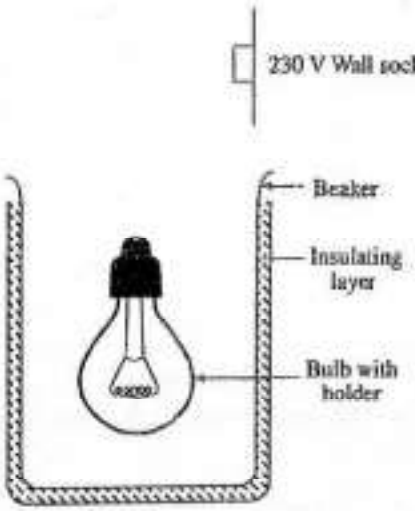

Figure shows some of the apparatus provided to you to experimentally determine the electric power dissipated as heat from a 230 V, 25 W filament bulb. You are asked to use water to collect heat given out by the bulb.

(*a*) (i) Complete the above diagram by including the other required apparatus, to show the experimental set up that you would use to perform this experiment, and label the items.

(ii) Mark on the diagram the level up to which you fill water.

(*b*) Give **two** reasons as to why it is advantageous to use a small beaker in this experiment.

(1) .....

(2) .....

(*c*) Give a list of apparatus needed to take measurements in this experiment.

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(*d*) When this experiment was performed with a 230 V, 25 W filament bulb, the temperature of water was found to increase from 28 °C to 37 °C in 10 minutes. Mass of the water used was 240 g. Estimate the electrical power that was transferred to water as heat (specific heat capacity of water = 4200 J kg^{-1} K^{-1}).

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(*e*) The value obtained in (*d*) above may not be exactly equal to the power dissipated as heat from the bulb. Give **two** possible modes of heat loss which are not taken into account in this experiment.

(1) .....

(2) .....

(*f*) Certain manufacturers indicate a maximum power rating for electric **lamp shades**. Briefly explain the reason for this.

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