

1. The diagram below is a depiction of a part of an AC induction motor. Explain the role and function of this part.

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2. The Manhattan Project is the code name given to the development of atomic (nuclear fission) bombs during World War II. 6

Discuss the significance of this project for society.

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3. The process used industrially to convert some fractions from the refining of petroleum into useful products such as ethene is: 1

- A catalytic cracking
- B fractional distillation
- C polymerisation
- D dehydration

4. Using the aid of diagrams, outline how is motor effect used in :

6

1) Loud speakers

and

2) Galvanometers

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5. Justify the procedure you used to compare the reactivities of an alkane and its corresponding alkene. Name the alkane, alkene and any other reagents used.

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6. A solution contains three cations,  $\text{Ba}^{2+}$ ,  $\text{Cu}^{2+}$  and  $\text{Pb}^{2+}$ . The flow chart indicates the plan used to confirm the identity of these cations.

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(a) Name Precipitate 2.

(b) Write a balanced net ionic equation for the formation of Precipitate 1.

(c) Suggest a test and the expected result that would confirm the identity of the metal cation remaining in Filtrate 2.

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7. Outline J.J. Thompson's experiment which helped clarify the true nature of cathode ray.

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8. Identify the occurrences of transformers in the society and justify their necessity.

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9. Discuss the use of eddy currents in the context of electromagnetic braking and induction cook tops.

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10. Describe the force(s) experienced by astronauts and objects inside international space station.