

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

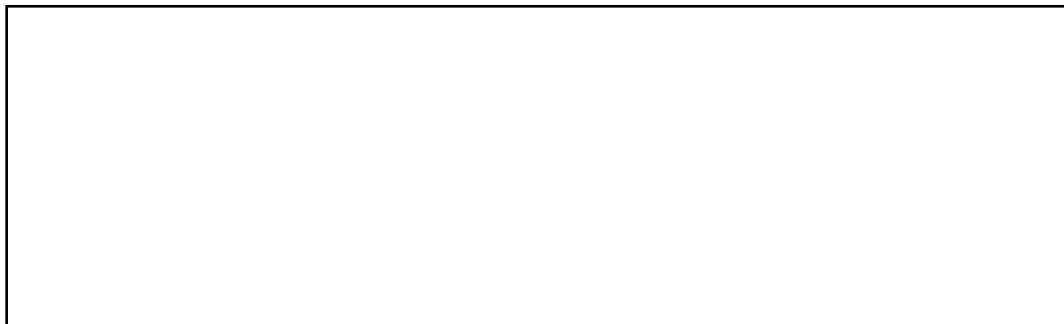
4. Using the aid of diagrams, outline how is motor effect used in :

6

1) Loud speakers

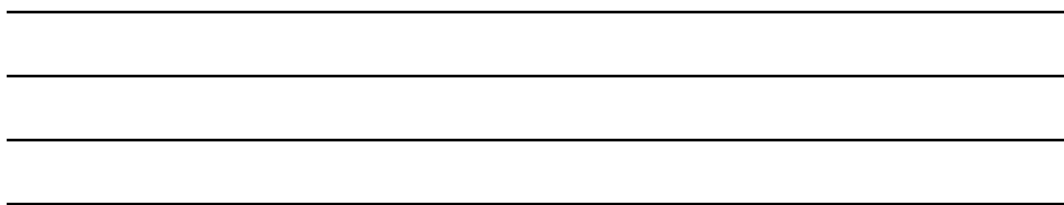
and

2) Galvanometers



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. 5

8. Identify the occurrences of transformers in the society and justify their necessity. 4

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.