

Name	Score

Question 1:

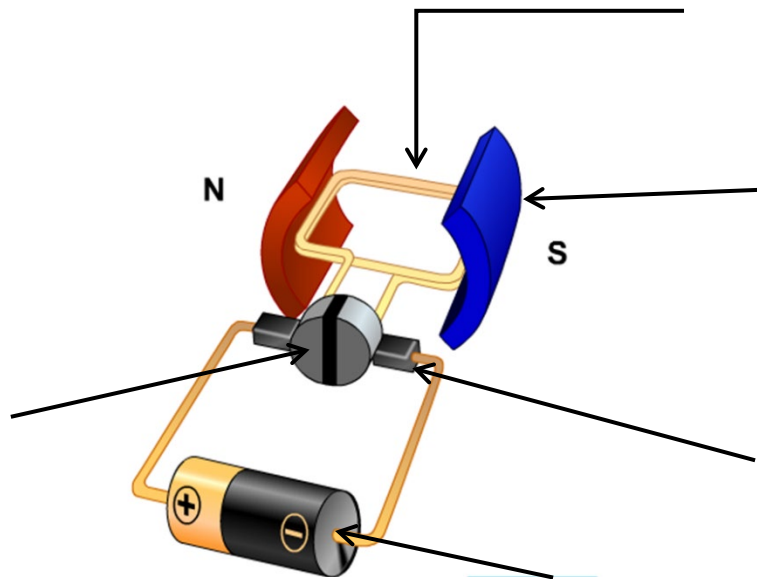
a) Identify two types of AC motors and give a characteristic of each (4 marks)

b) Explain how a three-phase induction motor generates a rotating magnetic field. (4 marks)

c) An AC motor rated at 400 V, 50 Hz is operating in a different country with a 60 Hz supply. Discuss two possible effects this could have on the motor's performance (4 marks)

Question 2:

a) Label the 5 parts of this DC motor (5 marks)



b) Explain the purpose of the commutator in the DC Motor (2 marks)

c) Describe the difference between shunt and series DC Motors (3 marks)

Question 3:

A car manufacturing line has multiple robotic arms which are used to combine components. Each robotic arm has 3 joints which each have their own motor. These joints are then connected by a plastic housing to each other.

a) What is the purpose of the motors in the robotic arm? (2 marks)

b) How would encoders be used by the robotic arm? (3 marks)

c) Describe the difference between an incremental encoder and an absolute encoder and determine which type would be appropriate for use in the robotic arm (3 marks)

d) The car manufacturing line often gets very dusty as it is housed in an old building, can you explain why an optical encoder would be a poor option for this environment? (3 marks)

e) Can you suggest a better option for what type of encoder to use and justify why (3 marks)
