

## Answers

### **MCQ**

ADBDB BDBCC CBBBD

### **Structured Questions**

- 16 (a) When CD is near PQ, the magnetic force on CD (due to magnetic field generated by current in PQ) is upwards and greater than the weight of CD.
- (b) As CD moves away from PQ, magnetic force decreases as the magnetic field generated by the current PQ weakens. CD can remain in equilibrium when the magnetic force on CD is equal to the weight of CD.
- 17 (a)  $4.8 \text{ m s}^{-1}$
- (b) Leftwards
- (c) Remains the same
- 18 (a) A to B
- (b) 0.075 N
- (c) 31 A
- 19 (a) (i)  $4.6 \times 10^{-14} \text{ N}$   
(ii)  $5.0 \times 10^{16} \text{ m s}^{-1}$
- (b) 0.023 m
- (c) Circular arc to the right within the field; straight line beyond the field
- 20 (a) Into the page
- (b) 0.46 T
- (c) (i) Same direction; greater radius  
(ii) 0.50 T
- 21 (a) Upwards

- (b) (i)  $1.3 \times 10^7 \text{ m s}^{-1}$   
(ii)  $1.8 \times 10^{11} \text{ C kg}^{-1}$
  
- 22 (a) Into the page. The magnetic field must interact with the current to produce an upward magnetic force, and the direction can be determined by Fleming's left hand rule.
  
- (b) 0.060 T
  
- (c) (i) The particle will travel in an upward trajectory.  
(ii) The particle will travel in an upward trajectory.  
(iii) The particle will remain undeviated.