## Answers for Tutorial 3

The marks to be awarded for each question are indicated in square brackets.

Problem 1 [10]

Magnitude of electric field  [2]

Distance moved  [2]

Work done  [2]

Hence  [2]

No work done because movement of charge is perpendicular to direction of E field [2]

Problem 2 [10]

Vector describing particle’s motion  [2]

 [2]

Work done  [2]

Angle  from  [3]

Hence  [1]

Problem 3 [5]

Torque  [2]

 [3]

Problem 4 [10]

Potential energy  [4]

Potential energy  [4]

Change in potential energy  [2]

Problem 5 [15]

Electric field  [3]

The electric field is uniform, has a magnitude of 240 Vm-1 and points in the –ive y direction [2]

Change in potential energy [2]

Work done  [2]

 [3]

Hence the work done appears as the change in potential energy of the system [1]

The work done is independent of the path taken, so the result must be the same despite the intermediate step [2]

The maximum total mark for this Tutorial is 50.