6. Automated and emerging technologies

6.2 Robotics

Marking scheme

Q1)

Question	Answer	Marks
(a)	Any **two** from: • It has a **mechanical** structure/framework • It has **electrical** components // by example	2
(b)	Any **two** from: e.g. • Employees don't need to lift heavy furniture • Employees can be protected from dangerous tasks • Employees can utilise their skills in other tasks • Employees don't need to perform repetitive/mundane tasks	2

Question	Answer	Marks
(c)	Any **one** from: e.g. • Expensive to **install/purchase/setup** • High ongoing costs/maintenance costs • May deskill the workforce • If they malfunction, production may stop	1

Q2)

Question	Answer	Marks
(a)	The robot can perform actions **without human intervention**	1
(b)	Any **three** from: • It has a **mechanical structure/framework** • It has **electrical** components • It is programmable • It can move	3

(d)	Any **two** from: Example: • The robot is more accurate when planting seeds • The robot does not need to take breaks // works 24/7 • The robot will not get bored of performing a repetitive task • The farmer can perform other tasks whilst the robot is planting the seeds • The robot may be faster/more efficient (at planting seeds) • Safer as the robot can work in a more dangerous environments (e.g. with animals in a field) • Doesn't need to pay **labour** costs/**wages**	2

Question	Answer	Marks
(e)	Any **two** from: Example: • The robot may have been expensive to **purchase** • The robot may need **maintenance** and this may be costly • The robot may take away jobs from humans that previously planted the seeds • Farmer/workers may be deskilled • Farmer may need training in how to use the robot • If it breaks the farmer will need to manually plant • If faulty it may cause damage to farm/seeds • Cannot adapt to a **new/unexpected** event	2
(f)	Any **two** from: Example: • The robot can now **adapt itself** by changing its own **rules/data/ processes** • The robot will become more efficient • … as it has a **greater knowledge** of its **surroundings/environment** • … as it can remember where a fence is • … as it can remember the route it needs to take • … as it can remember where any obstacles are to avoid • … as it can remember where to start and stop sowing seeds • … as it may make fewer errors	2