

# Markscheme

① TAC|GGT|CAG|GCC|ACC|CTC|GAA|TTA|AGA|TTC|ATT  
AUG CCA GUC CGG UGG GAG CUU AAU UCU AAG UAA mRNA  
met - pro - val - arg - trp - glu - leu - asn - ser - lys (STOP) polypeptide

② a) TAC|GGT|CAG|CC|ACC|TC|GAA|TTA|AGA|TTC|ATT  
AUG CCA GUC GGU GGG AGC UUA AUU CUA AGU AA mRNA

- i) met - pro - val - gly - gly - ser - leu - ile - leu - ser
- ii) deletion - frameshift
- iii) will be affect as most of polypeptide is composed of different amino acids

b) TAC|GGT|CAG|GCC|ACC|CCC|GAA|TTA|AGA|TTC|ATT  
AUG CCA GUC CGG UGG GGG CUU AAU UCU AAG UAA mRNA

- i) met - pro - val - arg - trp - gly - leu - asn - ser - lys (STOP)
- ii) missence - base substitution
- iii) will be affect as different polypeptide sequence

c) TAC|GGT|CAG|GCC|ACC|CTC|GAA|TTA|AGA|TTT|ATT  
AUG CCA GUC CGG UGG GAG CUU AAU UCU AAG UAA mRNA

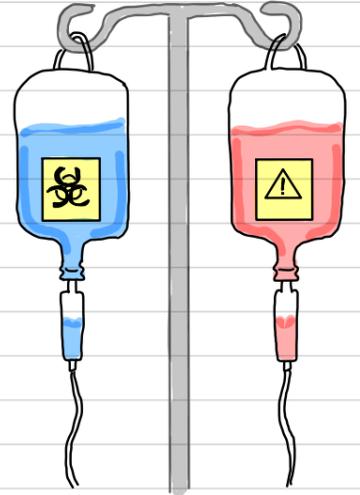
- i) met - pro - val - arg - trp - glu - leu - asn - ser - lys (STOP)
- ii) silent - base substitution
- iii) no affect as same polypeptide formed

d) TAC|GGT|CAG|GCC|ACT|CTC|GAA|TTA|AGA|TTC|ATT  
AUG CCA GUC CGG UGA GAG CUU AAU UCU AAG UAA mRNA

- i) met - pro - val - arg (STOP)
- ii) nonsense - base substitution
- iii) will be an affect - polypeptide shortened, likely non-functional

- ③ a) difficult to diagnose as cancer cells are your own cells thus unlike an infection it will not trigger an immune response which is typical signs used in diagnoses. The earliest sign of cancer is a tumor which can be small or hidden, making it difficult to detect early. By the time some cancers start causing symptoms like pain/bleeding etc it has grown / spread a lot

difficult to treat as again, cancer cells are your own cells so targeting only cancerous cells and not healthy cells is difficult. Chemotherapy targets fast-dividing cells so they address cancer BUT also healthy fast dividing cells: skin, blood, stomach lining, hair, nails

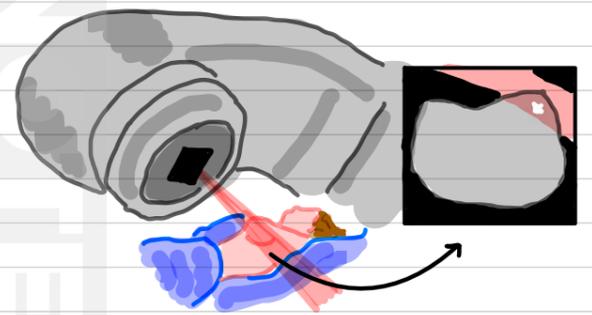


- b) Chemotherapy - drugs given to a cancer patient, typically through IV

- ↳ the drugs target fast-dividing cells and cause them to die or stop dividing ex: prevent DNA replication by inhibiting enzymes
- ↳ exposes entire body, ideally targeting cancer clusters that have metastasized

Radiation therapy - uses high energy radiation or particles (x-ray, gamma,  $H^+$ , electrons)

- ↳ the radiation causes DNA / cell damage, leading to cell death
- ↳ usually done locally to target a specific region



- ④ many potential answers - share answers with class

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MARIER