

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- (a) 1. Lipid soluble;
Ignore 'not water soluble' or 'fat soluble'.
2. (Diffuse through) phospholipid (bilayer);
Ignore reference to joining to receptors/channels/carriers but reject passage through protein channels/carriers.
- 2
- (b) 1. Has a (specific) tertiary structure/shape;
Accept in context of AR or testosterone.
Ignore 3D.
2. (Structures are) complementary;
Reject reference to antigen.
Reject reference to active site, enzyme, substrate or induced fit.
- 2
- (c) 1. (AR is) a transcription factor;
Ignore 'binds to bases' or 'binds to gene'.
2. Binds to DNA/promoter;
Reject reference to active site, enzyme, substrate or induced fit.
3. (Stimulates) RNA polymerase;
- 2 max
- (d) 1. With 16 or fewer than 16 (repeats the association) is significant;
*If none of the marks is awarded allow principle mark of (prostate) cancer more likely with 16 or less than 16 (repeats) **or** (prostate) cancer less likely with 17 or more than 17 (repeats)*
OR
*Alternative principle mark Correctly links significant/not significant to correct probability value/percentage **or** to rejecting/accepting the null hypothesis.*
Reject 'the results are significant'.
Accept 'difference in results is significant'.
2. *With 17 or more than 17 (repeats the association) is **not** significant;
3. *With 16 or fewer than 16 (repeats) there is less than a 5% or less than 0.05 probability of being due to chance

OR

*With 17 or more than 17 (repeats) there is more than a 5% or more than 0.05 probability of being due to chance

OR

*Explanation of a probability value e.g. 0.30 is a 0.30 or 30% probability of being due to chance;

Accept equivalent responses in terms of 95% or 0.95 probability.

4. *With 16 or fewer than 16 (repeats) reject the null hypothesis

OR

*With 17 or more (repeats) accept the null hypothesis;

**Accept reference to any number of repeats (e.g. 18) between 17 to 20 for 17 or more than 17 (repeats).*

3 max

[9]

Q2.

- (a) 1. Affects/damages basement membrane

OR

More protein channels/carriers in basement membrane;

2. Proteins can pass into the (glomerular) filtrate/tubule;
Ignore nephron.

2

- (b) Box 4 The non-homologous section of an X chromosome

1

- (c) 1. Effective as D has lower protein (than B/C);
Accept descriptions of each group e.g. A = wild type mice. B = AS mice. C = AS mice that received AS stem cells. D = mice that received wild type stem cells.
Accept 'healthy' or 'without AS' for 'wild type'.

2. Not fully effective as D has higher protein than A;
3. Do not know all results for other mice in D

OR

Only shows results for 68% of mice;

4. Some of D mice may have been cured

OR

Some of D may have died;

5. Do not know actual/numerical quantity of protein;
6. (Investigation) only on mice

OR

(Investigation) not on humans;
Accept 'rats' for 'mice'.

7. Rejection may occur;
Accept 'immune response' for rejection.
8. Only shows results for 20 weeks/short-time period

OR

Long-term effects not known;
Ignore answers relating to sample size or statistical test.

4 max

- (d) 1. (Transplanted stem cells) differentiate/specialise;
2. Reduce loss of protein at the glomerulus

OR

Prevents protein moving into filtrate;
Accept Bowman's/renal capsule.