

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- (a)
- One mark**
- for each row.

If values do not match the given unit, **max 1**.

Concentration of copper sulfate solution/ g kg^{-1}	Volume of 100 g kg^{-1} copper sulfate solution / cm^3	Volume of water / cm^3
75	22.5	7.5

*Accept dm^3 / mm^3 for volume unit.**Accept $0.0225/2.25 \times 10^{-2}/22\ 500$ and $0.0075/7.5 \times 10^{-3}/7500$* *Ignore units in 2nd row.**Do not accept $\text{mm}^{-3}/\text{cm}^{-3}/\text{dm}^{-3}/\text{ml}$*

2

- (b) 1. Density of 10% protein solution = 1.028;
 2. More dense (than 25 g kg^{-1} copper sulfate solution);

2

- (c) 16.5 **and** 22;
Must be in correct order

1

- (d) Any
- three**
- from:

(Tom)

- (Healthy donor) not allowed to donate;
- Less blood collected

OR

Fewer patients treated;

- Cause Tom anxiety (about his health);

(Lucy)

- (Gives blood) when it may not be safe (for her) to do so;

5. (Her blood) may not help patients;
6. Her (missed) low haemoglobin goes untreated;
Max 2 for either Tom or Lucy
If no credit awarded, max 1 mark for idea of too little haemoglobin left to carry oxygen in blood
OR
reduced oxygen to respiring tissues

3 max

[8]

Q2.

- (a) 1. 2 nuclei (in cells)

OR

Cells (stopped) at telophase;

2. Cytokinesis prevented

OR

Stopped (new) cell membrane forming

OR

Stopped cytoplasm dividing;

Accept cell membrane not dividing/splitting/ pinching (in the cell)

2

- (b) 1. (MiTMAB) binds (to dynamin) other than the active site;

Accept (MiTMAB) binds to dynamin at an allosteric OR inhibitor site

2. Changes the shape of (dynamin) active site

OR

Changes the tertiary structure (of dynamin/ enzyme);

Accept denature for 'change in shape'

3. Not complementary so substrate does not bind (to active site)

OR

Not complementary so no/fewer enzyme-substrate complexes (form);

Accept ES complex in this instance

Ignore ESC

Accept fit OR attach for bind

3

- (c) 1. (At) lowest concentrations (all) dynamin is not inhibited

OR

(At) lowest concentrations (MiTMAB) does not cause cell death/inhibit cytokinesis;

Accept graph readings in range 30 to 70 for lowest;

Accept 'has no effect' for 'cause cell death/inhibit cytokinesis'

Accept 'prevents inhibition of cell death' for 'causes cell death'

Accept 'cell replication' OR mitosis for cytokinesis

2. (As MiTMAB) concentration increases more dynamin is inhibited/inactive

OR

(As MiTMAB) concentration increases cell death increases

OR

(As MiTMAB) concentration increases cytokinesis decreases

OR

No change in cell number at 2000 ($\mu\text{g dm}^{-3}$)

OR

No change in cell number at 0.0 (on y axis);

Accept 'cell replication' OR mitosis for cytokinesis

3. (At) highest (MiTMAB) concentrations all dynamin is inhibited

OR

(At) highest concentrations (MiTMAB) causes cell death

OR

(At) highest concentrations (MiTMAB) inhibits cytokinesis;

Accept 'prevents inhibition of cell death' for 'causes cell death'

Accept 'cell replication' OR mitosis for cytokinesis

Accept graph readings >2000 to 8000 for highest

3

- (d) Correct answer in range 19.3 to 19.7 = **2 marks**;;

Accept for **1 mark** evidence of

70 **and** 2000 (correct readings from the graph) /

30 **and** 2000 (correct readings from the graph)

OR

1930 (correct increase in MiTMAB, 70 to 2000) /

1970 (correct increase in MiTMAB, 30 to 2000)

OR

Division by 100/multiplication by 0.01 (correct conversion to mass in 0.01 dm^3);

Correct answer

19.3 (is obtained from 70 and 2000)

19.7 (is obtained from 30 and 2000)

*Accept for 1 mark, any value in range 30 to 70 **and** 2000*

Accept for 1 mark, any value in the range 1930 to 1970

2

[10]