

Biology 12
 August 2006 — Form A
 Provincial Examination — Answer Key

Cognitive Processes

K = Knowledge
U = Understanding
H = Higher Mental Processes

Question Types

67 = Multiple Choice (MC)
6 = Written Response (WR)

Topics	Prescribed Learning Outcomes (PLOs)	Weightings
1. Cell Biology	A, B, C, D	18%
2. Cell Processes and Applications	E, F, G, H	18%
3. Human Biology	I, J, K, L, M, N, O, P	64%

Question Number	Keyed Response	Cognitive Process	Mark	Topic	PLO	Question Type
1.	B	K	1	1	A1	MC
2.	C	H	1	1	A1	MC
3.	A	U	1	1	A1	MC
4.	C	U	1	1	A1	MC
5.	A	U	1	1	A1	MC
6.	D	K	1	1	B2	MC
7.	D	U	1	1	C1	MC
8.	C	U	1	1	C2	MC
9.	D	H	1	1	C2	MC
10.	A	U	1	1	C4	MC
11.	D	U	1	1	C5	MC
12.	D	U	1	1	D1	MC
13.	B	K	1	1	D1	MC
14.	D	U	1	1	D1	MC
15.	C	U	1	1	D2	MC
16.	C	U	1	1	D2	MC
17.	A	U	1	2	E4	MC
18.	B	U	1	2	E1	MC
19.	D	U	1	2	E1	MC
20.	C	K	1	2	E1	MC
21.	A	K	1	2	G1	MC
22.	B	U	1	2	G3	MC
23.	D	U	1	2	G3	MC
24.	D	H	1	2	G4	MC
25.	A	U	1	2	G3	MC
26.	A	U	1	2	G3	MC
27.	A	H	1	2	H6	MC
28.	B	K	1	2	H2	MC
29.	D	U	1	2	H6	MC

Question Number	Keyed Response	Cognitive Process	Mark	Topic	PLO	Question Type
30.	C	K	1	3	I1	MC
31.	B	K	1	3	I1	MC
32.	C	H	1	3	I2	MC
33.	C	H	1	3	I4	MC
34.	D	U	1	3	I7	MC
35.	C	H	1	3	I7	MC
36.	C	U	1	3	J1	MC
37.	A	H	1	3	J1	MC
38.	B	K	1	3	J2	MC
39.	B	H	1	3	J5	MC
40.	C	U	1	3	J9	MC
41.	B	H	1	3	J12	MC
42.	C	K	1	3	K1	MC
43.	C	U	1	3	K1	MC
44.	B	K	1	3	K2	MC
45.	D	K	1	3	L1	MC
46.	D	U	1	3	L5	MC
47.	D	K	1	3	L6	MC
48.	A	H	1	3	L8	MC
49.	A	U	1	3	M1	MC
50.	D	U	1	3	M2	MC
51.	C	H	1	3	M3	MC
52.	D	K	1	3	M6	MC
53.	D	K	1	3	M8	MC
54.	B	K	1	3	N4	MC
55.	B	K	1	3	O1	MC
56.	C	K	1	3	O2	MC
57.	C	H	1	3	O2	MC
58.	C	H	1	3	O2	MC
59.	C	U	1	3	O2	MC
60.	A	U	1	3	O5	MC
61.	B	U	1	3	O5	MC
62.	C	K	1	3	P7	MC
63.	A	K	1	3	P1	MC
64.	D	U	1	3	P1	MC
65.	A	H	1	3	P6	MC
66.	D	U	1	3	P10	MC
67.	A	H	1	3	P12	MC

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Provincial Examination — Written-Response Key / Scoring Guide

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Topics

1. Cell Biology
2. Cell Processes and Applications
3. Human Biology

Prescribed Learning Outcomes (PLOs)

A, B, C, D

E, F, G, H

I, J, K, L, M, N, O, P

Weightings

18%

18%

64%

Question Number	Keyed Response	Cognitive Process	Mark	Topic	PLO	Question Type
1.	—	U	4	2	H3, 6	WR
2.	—	U	4	3	I1, 2, 4	WR
3.	—	U	4	3	J1	WR
4.	—	U	3	3	L6, 7	WR
5.	—	U	4	3	M6	WR
6.	—	U	4	3	P6	WR

1. Explain how the addition of mercury affects the rate of an enzyme-catalyzed reaction.

(4 marks)

KEY

- **Substrates bind to enzymes at the active sites.**
 - **Mercury ions denature the enzymes.**
 - **This results in a change in the shape of the active sites.**
 - **The substrates cannot bind to the active sites.**
 - **The rate of reaction decreases.**
- } any four for
1 mark each

2. Describe the complete chemical digestion of starch, into a form that can be absorbed in the small intestine. **(4 marks)**

KEY

- Salivary amylase digests starch.
 - Pancreatic amylase digests starch.
- } either one for
1 mark

AND

- starch → maltose (1 mark)
- maltase digests maltose (1 mark)
- maltose → glucose (1 mark)

3. How is the structure of an arteriole related to its function?

(4 marks)

KEY

- has thick walls that resist blood pressure
- has elastic fibres to allow stretching and recoil
- when the arteriole contracts, this increases blood pressure to the remainder of the body
- endothelium layer provides smooth surface (less friction) for blood movement
- has sphincters which control blood flow to the capillary beds
- has smooth muscles which control blood flow to the capillary beds

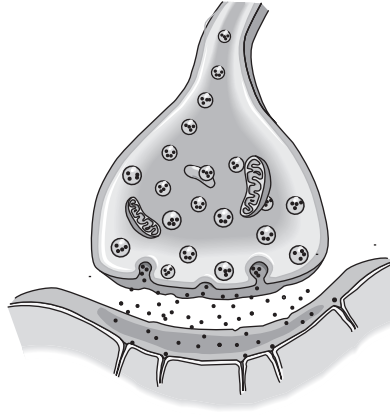
} any four for
1 mark each

4. Describe the conditions in the blood that cause the medulla oblongata to increase the rate of contraction of the diaphragm. **(3 marks)**

KEY

- **increased concentration of carbon dioxide (CO_2)**
 - **increased concentration of bicarbonate ions (HCO_3^-)**
 - **increased acidity**
 - **decreased concentration of oxygen (O_2)**
- } **any three for
1 mark each**

Use the following diagram to answer question 5.



5. Describe the sequence of events that occur when a nerve impulse reaches the structures shown above. (4 marks)

KEY

- Calcium ions move into the cell.
- They interact with contractile proteins and pull the vesicles to the surface of the presynaptic membrane.
- The vesicles merge with the presynaptic membrane and release neurotransmitters into the synaptic cleft.
- The neurotransmitters diffuse across the cleft.
- The neurotransmitters fit into receptor sites, causing the postsynaptic membrane to depolarize.

} any four for
1 mark each

6. Describe how negative feedback regulates the level of testosterone in the blood. (4 marks)

KEY

- The hypothalamus secretes gonadotropic-releasing hormone (GnRH).
- GnRH stimulates the anterior pituitary to secrete luteinizing hormone (LH).
- LH stimulates the interstitial cells of the testes to produce testosterone.
- As the level of testosterone rises, there is negative feedback exerted on the hypothalamus.
- As the level of testosterone rises, there is negative feedback exerted on the anterior pituitary.
- The secretion of LH slows down and testosterone decreases.

} any four for
1 mark each