

**ANSWER KEY****Chapter 15 Test Answer Key****BLM 15.4.1A**Answers to **Multiple Choice** Questions

1. b
2. d
3. b
4. c
5. d
6. a
7. d
8. b
9. c
10. a
11. d
12. b
13. c
14. b
15. d
16. a
17. d
18. c
19. b
20. c
21. b
22. a
23. a
24. d
25. c

Answers to **Numerical Response** Questions

1. 2, 4, 1, 3
2. 5, 3, 1, 4, 2
3. 2, 2, 1, 3
4. 4, 2, 1, 3

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### Sample Answers to **Written Response** Questions

1. a) Nutritional functions:

- transports nutrients (for example, glucose, amino acids, fatty acids, minerals, and vitamins) from the mother's blood to the fetus's blood
- stores nutrients, such as carbohydrates, proteins, iron, and calcium, in early pregnancy and releases them into the fetus later, when fetal demand is greater than the mother can absorb from her diet.

Excretory functions:

- transports wastes (such as urea, ammonia, and creatine) from the fetal blood to the mother's blood

Respiratory functions:

- transports oxygen from the mother to the fetus and carbon dioxide from the fetus to the mother

Endocrine functions:

- secretes hormones, such as estrogen, progesterone, and human chorionic gonadotropin
- allows hormones from the fetus to diffuse into the mother's blood and hormones from the mother to diffuse into the fetus's blood

Immune functions

- transports antibodies from the mother into the fetus's blood to provide passive immunity (5 marks)

b) The proximity of the maternal and embryonic blood systems permits nutrients and oxygen to diffuse from the mother's circulatory system to the developing baby and for wastes to leave the baby's circulation and enter the mother's excretory system. They are separate to prevent the mixing of the mother's blood with the baby's blood, which could trigger an immune response (antibodies from the mother's blood could, if the maternal blood type is different from that of the fetus's blood type, destroy the red blood cells of the fetus). (3 marks)

c) The placenta does not filter out substances such as nicotine in cigarette smoke. Nicotine (a teratogen) can diffuse across the membranes of the placenta and enter the baby's blood. Cigarette smoke can constrict the fetus's blood vessels, preventing the fetus from getting enough oxygen. Mothers who smoke tend to have babies that are underweight. Cigarette smoke during pregnancy also increases the risk of having premature births, stillbirths, and miscarriages. There is mounting evidence of behavioural problems and reduced intellectual ability in children of smoking mothers. (3 marks)

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- d) Because the umbilical cord physically links the fetus with the placenta, and because the placenta is a source of nutrition and gas exchange for the fetus, the function of the umbilical cord likely would be to provide a means for transporting nutrients and oxygen to the fetus, as well as a means for transporting carbon dioxide and waste products from the fetus. (2 marks)
- e) In the fetus, blood entering the right atrium is oxygen-rich. Rather than pumping blood into the pulmonary system, it is more advantageous to get the oxygen-rich blood directly to the left side of the heart where it can be pumped to the rest of the fetal cells. (2 marks)
- f) Because the placenta does the work of exchanging oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) through the mother's circulation, the fetal lungs are not used for breathing. The ductus arteriosus helps to get the oxygen-rich blood from the right side of the heart into the systemic circulatory system of the fetus. (2 marks)