SNC2D Exam Review

The break down of this examination is as follows:

Part A: Multiple Choice (KU/Inq)	**40 marks**	**40 minutes**
Part B: Matching (MC) (total of 20 worth 1/2 mk each)	**10 marks**	**10 minutes**
Part C: Short Answer (MC) (3 out of 6 questions)	**15 marks**	**15 minutes**
Part D: Problem (Inq) (3 out of 6 questions)	**15 marks**	**15 minutes**
Part E: Essay (Comm) (1 out of 4 questions)	**10 marks**	**10 minutes**

Below are practice questions to help you prepare for the exam. Mr. Szerminski has the answers to the questions to lend to you to check once you have done them.

Multiple Choice

Identify the choice that best completes the statement or answers the question.

____ 1. During interphase, the cell is carrying out all of the following activities, *except*
   a. division
   b. respiration
   c. growth
   d. specialized functions

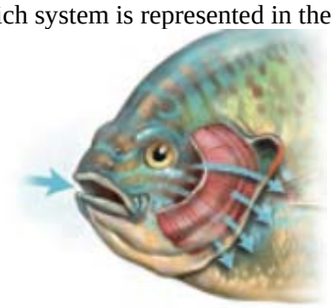
____ 2. Cells living with other cells within a multicellular organism
   a. include amoebas
   b. are similar in shape to all of the other cells
   c. carry out their life functions without the help of other cells
   d. are all highly specialized

____ 3. Which organelle is present in the cells of a tree but not present in the cells of a human?
   a. nucleus
   b. vacuole
   c. endoplasmic reticulum
   d. chloroplast

____ 4. What is coronary artery disease?
   a. a weakened heart
   b. a virus
   c. partially blocked coronary arteries
   d. holes in the coronary arteries

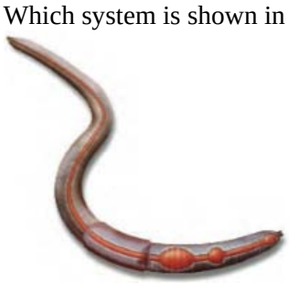
____ 5. Which of the following are signs of a heart attack?
   a. chest pain or pressure
   b. anxiety
   c. dizziness
   d. all of the above

____ 6. Which system is represented in the diagram shown below?



   a. digestive
   b. respiratory
   c. nervous
   d. musculoskeletal

____ 7. Which system is shown in the worm below?



a. digestive
b. respiratory
c. musculoskeletal
d. circulatory

____ 8. Based on what you have learned, which hypothesis best describes how immunizations might work to protect people from various diseases?
a. They provide vitamins to strengthen the immune system.
b. They provide a small dose of disease so the immune system can know how to defeat the disease.
c. They store needed medicine in the body to fight the disease.
d. They remove toxins from the body that lead to disease.

____ 9. Which system(s) tell(s) us when we need to eat or drink something?
a. digestive
b. circulatory
c. nervous
d. all the above

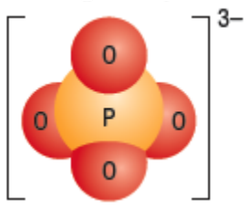
____ 10. Engineers in a factory want to use a spray of dry abrasive to clean paint from machinery. The best chemical for this purpose would be
a. hydrogen peroxide
b. baking soda
c. water
d. carbon dioxide

____ 11. What is true about nickel-cadmium rechargeable batteries?
a. They lose their ability to hold their charge after many discharge-recharge cycles.
b. It is estimated that over half of the cadmium leaching into ground water from landfills comes from discarded NiCd batteries.
c. Cadmium is highly toxic and is known to cause cancer in humans.
d. all of the above

____ 12. Of the following, which would be the best conductor of electricity?
a. pure water
b. tap water
c. sea water
d. freshwater from a lake

____ 13. What is the correct chemical formula for the compound copper(II) fluoride?
a. CuF_2
b. Cu_2F
c. CuF
d. Cu_2F_2

____ 14. The diagram represents a



a. polyatomic ion
b. molecule
c. ion
d. none of the above

____ 15. Choose the correct word equation for

$Zn + CuSO_4 \rightarrow ZnSO_4 + Cu + energy$
a. reactant + reactant → energy
b. zinc + copper sulfate → zinc sulfate + copper + energy
c. zinc + copper → zinc sulfate + copper sulfate + energy
d. zinc sulfate + copper sulfate → zinc + copper + energy

____ 16. How do you know that the following equation is balanced?

$C_4H_8 + 6\ O_2 \rightarrow 4\ CO_2 + 4\ H_2O$
a. There are 4 C on each side.
b. There are 4 C, 8 H, and 4 O on each side.
c. There are 4 C, 8 H, and 6 O on each side.
d. There are 4 C, 8 H, and 12 O on each side.

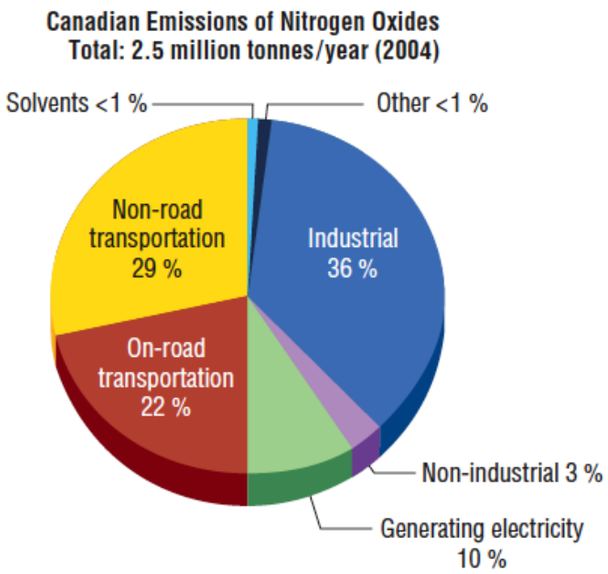
____ 17. Hydrogen is not the ideal fuel because

a. it requires energy to be produced
b. it does not burn cleanly
c. it produces greenhouse gases when burned
d. it will not burn

____ 18. Which of the following is true?
a. Alloys of iron are always less rust-resistant than pure iron.
b. Alloys of iron can be more rust-resistant than pure iron.
c. Pure iron is more rust-resistant than stainless steel.
d. Pure iron is more rust-resistant than copper.

____ 19. NO_x
a. is the formula for any kind of air pollution
b. refers to nitrogen dioxide only
c. refers to a number of nitrogen oxides
d. refers to nitrogen monoxide only

____ 20. According to this graph, what percentage of nitrogen oxides emissions resulted from cars, trains, or air transportation?



a. 29 %
b. 22 %
c. just under 50 %
d. just over 50 %

____ 21. How do acids assist in the storage of food?
a. They eat away at freezer burn.
b. They prevent contamination by bacteria.
c. They react with air.
d. They improve the taste of certain foods.

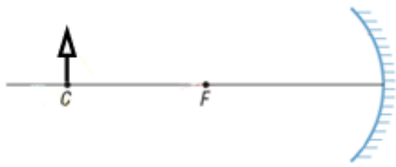
____ 22. Highly basic solutions are
a. safe to handle
b. sweet tasting
c. corrosive and reactive like highly acidic solutions
d. corrosive but not reactive

____ 23. What is unusual about the base NH_4OH, ammonium hydroxide?
a. It has a hydroxide ion.
b. It is an acid because it has 5 hydrogens.
c. It has a metal cation.
d. It has a non-metal cation.

____ 24. What gets neutralized in a neutralization reaction?
a. acids only
b. bases only
c. both acids and bases
d. ionic compounds only

____ 25. Magnifying mirrors are usually concave because concave mirrors
a. can form either a virtual or a real image
b. form a virtual image that is in front of the mirror
c. form a virtual image that is smaller than the actual object
d. form a virtual image that is larger than the actual object

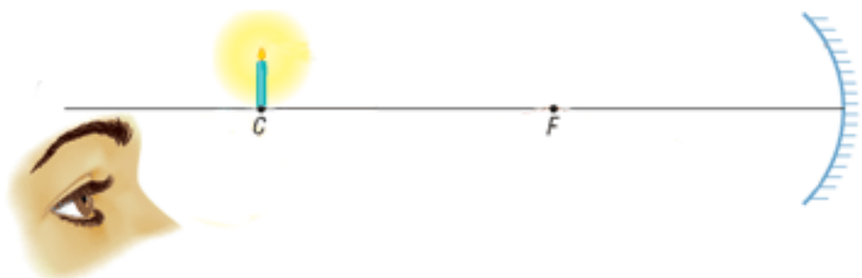
____ 26. Where will the image of this object be located?



a. at *F*
b. between *F* and *C*
c. between *F* and *V*
d. at *C*

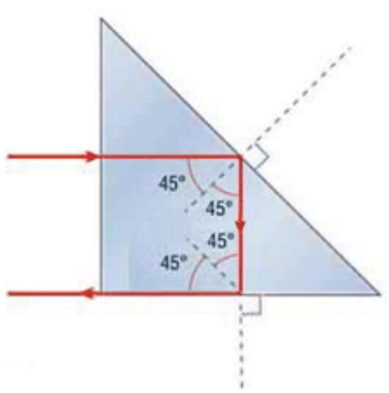
____ 27. Why do cars reflected in a side-view mirror appear to be farther away than they actually are?
a. The car is moving at high speed.
b. The image is formed alongside the car rather than behind it.
c. The image is reduced, and things look smaller as they move farther away.
d. They don't; they appear to be closer than they are.

____ 28. An object is placed at C. What kind of image will this situation produce?



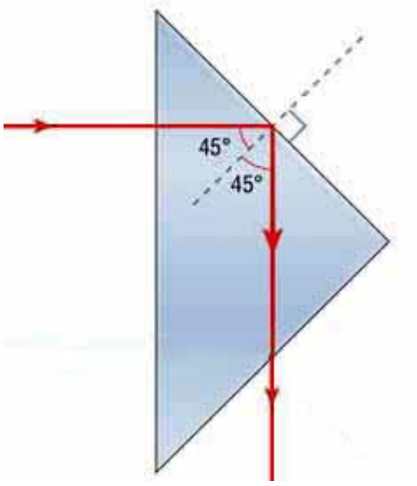
a. real, upright, same size as the original
b. real, inverted, smaller the original
c. real, inverted, same size as the original
d. virtual, upright, same size as the original

____ 29. How would you change this diagram to make it accurate?



a. Move the lower right-angle symbol to the other side of the normal.
b. Have the incident ray strike the prism at a different angle.
c. Have the refracted ray continue downward out of the prism perpendicular to the incident ray.
d. It is accurate as it is.

____ 30. How would you change this diagram to make it accurate?



a. Have the incident ray enter the prism directly opposite the apex.
b. Have the incident ray enter the prism from the other side.
c. Have the refracted ray refract a second time and exit the prism to the left perpendicular to the refracted ray.
d. It is accurate as it is.

____ 31. The speed of light in acrylic is 2.01×10^8 m/s. What is the index of refraction of acrylic?
a. 1.47
b. 2.42
c. 1.49
d. 2.01

____ 32. Which of the following is a virtual image?
a. moonlight on a lake
b. the Sun when it is near the horizon
c. a mirage on the highway
d. all of the above

____ 33. You can calculate a medium's index of refraction if you know the speed of light in that medium and
a. the angle of incidence of a given light ray
b. the angle of refraction of a given light ray
c. the density of the medium
d. the speed of light in a vacuum

____ 34. Astronomers have built a new observatory high in the mountains. It has a refracting telescope with an objective lens that is 2 m in diameter. The images they get through the telescope are blurry and distorted. What might be the problem?
a. The lens is too big.
b. The observatory is at too high an altitude.
c. The telescope should have a second lens to fix the distortions.
d. The temperature around the observatory is too cold.

____ 35. An object 15.1 cm tall is placed in front of a converging lens. An upright, virtual image of magnification 2.5 is formed. What is the height of the image and where is it located?
a. 6.04 cm from the lens, on the same side as the object.
b. 6.04 cm from the lens, on the opposite side from the object.
c. 37.75 cm from the lens, on the same side as the object.
d. 37.75 cm from the lens, on the opposite side from the object.

____ 36. Flexible roll film was invented by
a. George Eastman in 1884
b. George Kodak in 1884
c. George Eastman in 1984
d. George Kodak in 1984

____ 37. What is accommodation?
a. the process of changing the focal length of the lens in the eye
b. the loss of elasticity in the lens of the eye that results in presbyopia
c. the process of changing the size of the iris to allow more or less light into the eye.
d. none of the above

____ 38. If you were trapped on a desert island, what kind of lens could you use to make a fire?
a. diverging
b. converging
c. Not enough information is given.
d. none of the above

____ 39. Every converging lens has two focal points. What factor determines which one is the principal focus and which is the secondary principal focus?

a. the curve of the lens
b. the distance of the object from the lens
c. the magnification of the lens
d. the direction in which the light rays from the object are entering the lens

____ 40. The image of an object from a converging lens is located at 2*F*. Where is the object?
a. beyond $2F'$
b. between F' and $2F'$
c. at $2F'$
d. Not enough information is given.

Completion
Complete each statement.

41. One of the functions of the cells in a particular part of the body is to produce mucus. These cells contain many _____.
42. Cells that use a lot of energy, such as muscle cells, have a lot of _____.
43. Plant cells that are exposed to sunlight most likely contain _____.
44. A plant's cell wall is made of a rigid substance called _____.
45. When digestive acids back up into the esophagus, the result is known as _____.
46. Transplanting organs from one species to another is called _____.
47. A number written in front of a substance in a balanced chemical equation is called a _____.
48. Most neutralization reactions are _____ reactions.
49. Pollution control equipment on today's cars is _____ 100 % effective.
50. Evidence that lemon juice has a high concentration of hydrogen ions is that it tastes _____.

Matching

Match the term with its definition or description.

a. bases
b. neutral
c. acids
d. acid leaching
e. neutralization reaction
f. hydroxide ions
g. antacid
h. acid precipitation
i. dry deposition
j. buffering capacity
k. acid-base indicator
l. pH scale

____ 51. substances that react with metals and carbonates
____ 52. feels slippery and tastes bitter
____ 53. a substance that changes colour depending on the acidity or basicity of the solution
____ 54. high concentration in a base
____ 55. a numerical acidity scale
____ 56. a pH reading of 7
____ 57. a process that removes heavy metals from contaminated soils
____ 58. neutralizes stomach acid
____ 59. the process in which acid-forming pollutants fall directly to Earth in non-liquid form
____ 60. the ability of a substance to resist changes in pH
____ 61. a chemical reaction in which an acid and a base react to form an ionic compound and water

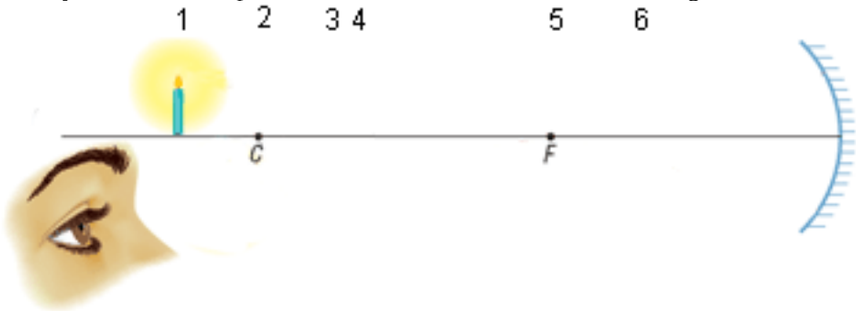
Choose the name or symbol for various substances.

a. HCl
b. NO_x
c. HF
d. NaHCO
e. NaOH
f. CaO
g. KOH
h. $Mg(OH)_2$
i. NO_2
j. SO_2

____ 62. sulfur dioxide
____ 63. sodium hydrogen carbonate or baking soda
____ 64. nitrogen dioxide
____ 65. calcium oxide or lime
____ 66. nitrogen oxides
____ 67. hydrofluoric acid

____ 68. magnesium hydroxide
____ 69. sodium hydroxide
____ 70. hydrochloric acid
____ 71. potassium hydroxide

An object is shown at position 1. Match each location on the diagram with a description.



a. position 2
b. positions 3, 4, or 6
c. position 6
d. positions 1, 2, 3, 4
e. position 1
f. positions 3 or 4
g. position 4
h. position 5.
i. position 5 or 6
j. positions 1, 2, 3, 4, 6

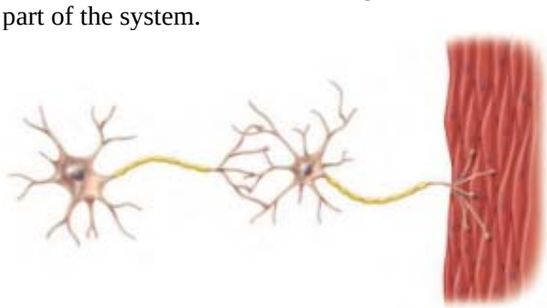
____ 72. When is the image the same size as the object?
____ 73. When is the image real and larger than the object?
____ 74. When is the image virtual?
____ 75. When is the image real?
____ 76. When is the image is between C and F?
____ 77. When is the image larger the object?
____ 78. When do you see no image?
____ 79. When do you see no real image?
____ 80. When do you see an image that is different in size than the object?

Short Answer

81. What does mitosis accomplish within the cell?

82. Do all animal cells look the same? Explain.

83. Generalize what occurs in the diagram below. Include in your description the name and function of the yellow part of the system.



84. Explain why a chlorine atom can “steal” an electron from a lithium atom if the two bump together.

85. Sodium chloride dissolves very well in water. Calcium carbonate barely dissolves in water, if at all. Offer ideas to explain this observation.

86. List three molecular compounds that have helped you or made your life better in the last day. Explain how each has helped.

87. Suppose we could completely get rid of gasoline-powered cars. How would you then feel about a ban on drilling for oil? Explain.

88. Write a general word equation for a complete combustion reaction and give an example of a complete combustion reaction.

89. Name an example of something in your everyday life that helps you understand the law of conservation of mass. Explain how it helps you.
90. Suppose you accidentally spilled some acidic cleaning fluid in a fish tank. What household substance could you quickly grab to try to fix the situation?
91. Why did the firefighters need an absorbent material to clean up the mess remaining after they neutralized the potassium hydroxide spill with cola in 2007 and left only a salt and water?
92. Why do power plant emissions from tall smoke stacks create a problem for people who live hundreds of kilometres from the power plant?

93. Aspirin is an acid and has been known to cause stomach upsets. How do you think *buffered* aspirin might prevent stomach upsets?
94. Explain why a glass prism splits white light.
95. Explain why some optical devices use prisms rather than mirrors to reflect light.
96. Explain how a window can be both reflective and transparent.
97. Describe an example of partial reflection and refraction from your everyday life.
98. An engineer has a sample of a transparent substance X that is either quartz, glass, or some kind of plastic. How can she use refraction to identify the substance?
99. If you had to teach a student in Grade 4 about what refraction is and why it occurs, what would you say?
100. What are the similarities and differences between hyperopia and presbyopia?

2D-exam-review Answer Section

MULTIPLE CHOICE

1. A
2. C
3. D
4. C
5. D
6. B
7. A
8. B
9. C
10. B
11. D
12. C
13. A
14. A
15. B
16. D
17. A
18. B
19. C
20. D
21. B
22. C
23. D
24. C
25. D
26. D
27. C
28. C
29. C
30. C
31. C
32. D
33. D
34. A
35. C
36. A
37. A
38. B
39. D
40. C

COMPLETION

41. Golgi bodies
42. mitochondria
43. chloroplasts
44. cellulose
45. heartburn

46. xenotransplantation
47. coefficient
48. double displacement
49. less than
50. sour

MATCHING

51. C
52. A
53. K
54. F
55. L
56. B
57. D
58. G
59. I
60. J
61. E

62. J
63. D
64. I
65. F
66. B
67. C
68. H
69. E
70. A
71. G

72. A
73. F
74. C
75. D
76. E
77. B
78. H
79. I
80. J

SHORT ANSWER

81. The contents of the nucleus are divided.
82. No, many cells are specialized cells whose appearance varies based on their function.
83. Messages in the form of electrical impulses are sent from the brain to the muscle, travelling from nerve cell to nerve cell. The yellow parts are the pathways, called axons, that the electrical impulses travel along. They are covered with the myelin sheath, which acts as an insulator as the impulses travel.
84. A lithium atom has one outer electron, so the outer orbit is far from full and the electron is weakly held. A chlorine atom strongly attracts an additional electron because its outer orbit is one electron away from being full. Thus the chlorine atom can pull the outer electron away from the lithium atom.

85. Sample answer: When both ionic compounds are placed in water, the water molecules will attempt to pull the ions apart. The attraction between the Na^+ and Cl^- ions is likely to be much less strong than the attraction between the Ca^{2+} and CO_3^{2-} ions, so the water molecules can pull NaCl apart, but not $CaCO_3$.
86. Sample answer: The molecular compound water helped me to get clean in the morning when I took a shower because water is such a good solvent. The molecular compound sugar gave me energy when I ate it. The molecular compound methane helped me cook my breakfast.
87. Answers may vary. Sample answer: I would be against the ban. Though we wouldn't need gasoline, a huge number of molecular compounds called petrochemicals are made from crude oil and natural gas, and we would still need them. Petrochemicals include plastics, synthetic fabrics, synthetic rubber, certain medicines, and even detergents.
88. Word equation:

    hydrocarbon + oxygen $\rightarrow$ carbon dioxide + water + energy

    $CH_4(g) + 2\ O_2(g) \rightarrow CO_2(g) + 2\ H_2O(g)$ + energy
89. Sample answer: It helps me to think of the law of conservation of mass in terms of a bank account. In a bank account, money cannot be created or destroyed. Any money you deposit will increase the balance of the account. Any money that you withdraw will decrease the balance. No changes in the balance can occur without either a deposit or a withdrawal taking place.
90. Sample Answer: I would add a mild base such as baking soda to try to correct the situation.
91. Sample Answer: The strong base, KOH, had been neutralized. However, the ionic compounds created by the neutralization reaction were still present, so they needed to be cleaned up.
92. Sample Answer: The polluting gases tall smoke stacks emit are deposited high into the atmosphere where prevailing winds can carry them hundreds of kilometres from the area directly around the plant.
93. Sample Answer: A buffer has the ability to resist pH change. So buffered aspirin would have the ability to neutralize the acid in the stomach as it worked.
94. Sample answer: When light enters the prism, it is refracted, but not all colours are refracted the same amount. Violet light slows down the most, so it refracts the most. Red light slows down the least, so it refracts the least. A ray of white light has become a spectrum of light of all different colours. The same thing happens when the light exits the prism, making the spectrum even easier to see.
95. Sample answer: When light is reflected in a mirror, some absorption occurs in the mirror, so all of the light is not reflected. Prisms absorb less light and reflect more light than mirrors do. Also, the reflective surface of a mirror deteriorates over time, which does not happen with a prism.
96. Sample answer: When light strikes the window glass, some of it is reflected back to our eyes, showing us a reflection of what's behind it. But some of the light passes through the window glass, illuminating whatever is beyond it.
97. Sample answer: When I look at the window, I can see the schoolyard outside and also a reflection of the classroom.
98. The engineer can refract light through the substance and determine its index of refraction. The index of refraction is characteristic for each substance so it will identify substance X.
99. Sample answer: When light moves from one thing to another—like from space into air, or from air into water—two things happen. The light changes speed, and it changes direction. This change in direction is called refraction.You see examples of refraction when you see a soda straw seem to bend in a glass of water.
100. Both are far-sightedness—the person can see distant objects well but not close-up objects. The cause of hyperopia is a misshapen lens that focuses *behind* the retina. A person with presbyopia has a very similar problem but it is due to lack of elasticity rather than a misshapen lens. Due primarily to aging, a presbyopic person just cannot switch back and forth between far-vision and near-vision. The lens is in a sense "permanently stuck" in far vision mode.