Anatomy & Physiology Event Leader Instructions

Stations need to be printed in color. Copy enough response sheets for each team to have one.

There are 15 stations for this test. If you have slightly more than 15 teams, you can intersperse the included rest stations and use the test as is. If you have more than 19 teams, use a second set of stations and run 2 groups at the same time.

Station 1 – needs a model of the skin. Use photograph if model is not available.
Station 3 – needs 1 set of colored pencils (green, red, blue).
Station 5 – has a set of skin disorder cards to be set out at the station. If you are printing this test, you can leave them in sheets or cut them apart.
Station 11 – if available, use the cow eye included in the airtight bag. Do NOT allow students to open the bag.

Teams should get 3 minutes per station. After 3 minutes, they should rotate to the next station.
Station 1

Match the letter of the indicated structure with the correct term below.

1. Adipose Tissue
2. Erector Muscle
3. Hair Follicle
4. Hair
5. Sweat Gland Duct
6. Stratum Spinosum
7. Stratum Corneum
8. Lamellated Corpuscle

9. The cells of the epidermis receive nourishment from blood vessels found in the___.
   A. dermis
   B. subaceous gland
   C. arrector pili muscle
   D. adipose tissue

10. The dermis layer containing fat cells, sweat glands, and blood vessels is the __ layer.
    A. epidermis
    B. stratum basale
    C. stratum spinosum
    D. reticular

11. Dermis and epidermis are anchored to each other by
    A. tendons
    B. dermal papillae.
    C. keratinocytes.
    D. hyperkeratosis.

12. An open comedo is commonly known as a
    A. Mole
    B. Birthmark
    C. Blackhead
    D. Whitehead

13. The thick skin on the palms of the hands and soles of the feet have an additional layer of epidermis called_____________________.

14. Most skin sensory receptors are in what layer?
Station 2

For each function listed below, name the site or sites where it occurs. Some answers will have more than 1 site, list all that apply.

A. Epidermis    B. Dermis    C. Hypodermis

15. Synthesis of pigments
16. Protects against dehydration and mechanical injury
17. Sensory reception for touch, temperature, pain and pressure
18. Temperature regulation

Match the description or picture to the type of cell, you will use some answers more than once:
A. Keratinocytes    B. Melanocytes    C. Langerhans cells    D. Merkel cells

21. Produce immune response against pathogens entering skin.
22. 4 – 5 layers, produces keratin, waterproofs skin.
23. Produce pigment.

Abominable Skin
Source: http://www.medicalhistology.us/twiki/pub/Main/ChapterSixSlides/a48b_dark_skin_40x_labeled.jpg
26. A medium power view through the hypodermis shows a ______, a sensory receptor for deep pressure and vibration.
Station 3

Select the word that best fills in the blank.

27. The skin produces a pigment called _______ to protect the body from ultraviolet radiation.
   A. Melamine
   B. Melanocine
   C. Cochineal
   D. Melanin

28. The inability to produce skin pigment is called __________.
   A. Albinism
   B. Keloidalis
   C. Rosacea
   D. Psoriasis

29. The skin reacts to ultraviolet radiation by synthesizing vitamin ___.

30. The cells manufacturing skin pigment are in the layer called ___.
   A. stratum lucidum
   B. stratum corneum
   C. stratum basale
   D. stratum spinosum

31. A man got his finger caught in a machine at a factory. The damage was less serious than expected, but nonetheless, the entire nail was torn from his right index finger. The parts lost were the body, root, bed, matrix, and cuticle of the nail. Is the nail likely to grow back?

32. Why or why not?

33. This is an extremely common toe problem. What causes “yellow toenails?”
   A. A fungus
   B. A virus
   C. A parasite
   D. Old Age
Station 3

34. Label and color the three following regions of hair.

- Cortex
- Cuticle
- Medulla

35. This person suffers from what pigment disorder?

36. What is the gland labeled in the picture to the right?

37. What does this gland produce?
38. Approximately ____ of skin aging is caused by the rays of the sun
   a. 0 – 25%
   b. 26% - 50%
   c. 51% - 75%
   d. 76% - 100%

39. How are antioxidants involved in the anti-aging effort?
   a. They reverse the aging process in skin cells
   b. They protect the skin from free radicals
   c. They block the sun’s rays
   d. They stimulate the growth of new skin cells

40. What vitamins act as antioxidants?
   a. A, C, and E
   b. A, B, and C
   c. B, C, and E
   d. C, D, and E

41. What are two skin-resurfacing techniques that reduce fine lines and wrinkles?
   a. Hydrabrasion and chemical peels
   b. Hydrabrasion and Botox
   c. Dermabrasion and chemical peels
   d. Dermabrasion and alpha-hydroxy acid treatments

42. Which of the twins below is likely a smoker?

43. Name 3 ways you skin changes as you get older.
Station 5

Match the pictures at this station with one of the diseases or conditions listed below.

44. First Degree Burn
45. Second Degree Burn
46. Third Degree Burn
47. Poison Ivy
48. Eczema
49. Carbuncle
50. Boils
51. Skin Cancer
52. Impetigo

53. An infection of herpes zoster that produces severely painful skin eruptions.
   A. Tuberculosis
   B. Shingles
   C. Mononucleosis
   D. Conjunctivitis
Station 6

54. The immune system can produce over ______ different antibodies.
   A. Five
   B. Five Hundred
   C. Five Thousand
   D. Five Million

55. The immune process which involves direct participation between body cells & foreign microorganisms is called ________
   A. Cell-mediated immunity
   B. Specific immunity
   C. Helper Gamma lymphocytes
   D. Suppressor T-lymphocytes

56. To prevent the immune reaction from becoming overactive, _____ are released.
   A. Helper T-lymphocytes
   B. Cytotoxica T-lymphocytes
   C. Suppressor T-lymphocytes
   D. Helper Gamma lymphocytes

57. Name the three main lines of defense the body has against invasion and give an example of each:

<table>
<thead>
<tr>
<th>Line of defense</th>
<th>Name</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st line of defense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd line of defense</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd line of defense</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Station 7

Immune System Crossword

Across
2. Causes localized redness, swelling, heat, and pain
5. A nonself marker that triggers the formation of lymphocyte armies
7. Any of a number of substances that are secreted by certain cells of the immune system and have an effect on other cells.
8. A colorless cell that circulates in the blood and body fluids and is involved in counteracting foreign substances and disease
9. Substances which bind to specific antigens and tag them for destruction
10. Stimulate gastric secretions and dilates blood vessels; released by the human immune system during allergic reactions

Down
1. The process of engulfing and breaking down pathogens and other unwanted substances
3. Disease-causing agent, such as bacteria and viruses
4. Macrophages secrete this, increases body temperature
6. Enzyme that kills pathogens by breaking open their cell walls; found in sweat, mucus, tears, and saliva
58. Which of the following terms is the correct label for step A in the diagram?
   A. Immunity
   B. Recognition
   C. Disposal
   D. Mobilization

59. Which of the following terms is the correct label for step B in the diagram?
   A. Immunity
   B. Mobilization
   C. Disposal
   D. Recognition

60. Which of the following terms is the correct label for step C in the diagram?
   A. Immunity
   B. Mobilization
   C. Disposal
   D. Recognition
61. What is occurring during step "C" of the immune response as indicated in the diagram?
   A. Antibodies are destroying pathogens.
   B. Pathogens are destroying antigens.
   C. Antigens are destroying germs.
   D. Pathogens are destroying antibodies.

62. The last step of the immune response, as indicated by label "D" in the diagram, creates a special type of B cell known as a
   A. killer B cell.
   B. antigen B cell.
   C. antibody B cell.
   D. memory B cell.

63. When bacteria enter the body through a cut in the skin
   A. the immune system shuts down.
   B. the third line of defense of the immune system is activated within seconds.
   C. the first line of defense of the immune system has succeeded.
   D. the second line of defense of the immune system is activated.

64. A chemical that is produced as a part of the inflammatory response is
   A. flagella.
   B. cilia.
   C. monoamine.
   D. histamine.
70. The largest lymphatic vessel of the body, the thoracic duct, empties into a vein called the ____.
   A. Left subclavian vein
   B. Submandibular lymph node
   C. Right cubclavian vein
   D. Superior vena cava

71. Lymph is filtered in masses of tissue called __________.
   A. Vena cava
   B. Adipose
   C. Adrenal gland
   D. Lymph nodes
72. To aid the immune system lymph nodes produce ____________
   A. Lacteals
   B. Reticular fibers
   C. Antibodies
   D. Melanocytes

73. Lymph node cells are primarily T-lymphocytes and ____________.
   A. B lymphocytes
   B. Refractors
   C. Suppressor T lymphocytes
   D. Alpha lymphocytes

74. Lymph nodes in the armpits are known as ______________.
   A. Humerous lymph nodes
   B. Axillary lymph nodes
   C. Lacrimal lymph nodes
   D. Radial lymph nodes
Station 10

HIV Transmission

Background

A dentist showed symptoms of HIV infection in late 1986, and was diagnosed with AIDS in 1987. At the time of the AIDS diagnosis, AZT therapy was begun, discontinued for a short period in late 1987, then restarted and continued until his practice closed in 1989. All of the dentist's employees, including the dental hygienists, tested negative for HIV antibodies.

The dentist wrote an open letter to his former patients, which prompted 591 persons to be tested for HIV antibodies. The following list summarizes the seropositive individuals.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Sex</th>
<th>Clinical Status</th>
<th>HIV Risk Factor</th>
<th>Dental Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>F</td>
<td>AIDS</td>
<td>No</td>
<td>6</td>
</tr>
<tr>
<td>B</td>
<td>F</td>
<td>CD4&lt;500/mm³</td>
<td>No</td>
<td>21</td>
</tr>
<tr>
<td>C</td>
<td>M</td>
<td>CD4&lt;200/mm³</td>
<td>Unknown</td>
<td>14</td>
</tr>
<tr>
<td>D</td>
<td>M</td>
<td>AIDS</td>
<td>Yes</td>
<td>19</td>
</tr>
<tr>
<td>E</td>
<td>F</td>
<td>CD4&lt;500/mm³</td>
<td>No</td>
<td>10</td>
</tr>
<tr>
<td>F</td>
<td>M</td>
<td>AIDS</td>
<td>Yes*</td>
<td>5</td>
</tr>
<tr>
<td>G</td>
<td>M</td>
<td>CD4&lt;400/mm³</td>
<td>No</td>
<td>2</td>
</tr>
</tbody>
</table>

* Patient F was an infrequent sex partner of patient E. Their last contact was in the fall of 1988.

** Tested seronegative in October and December 1988, positive in December 1990.

Analyses of DNA and amino acid sequences from HIV isolated from the patients strongly suggest that five of the patients were infected by the dentist.

75. Which two were not?

76. How did you arrive at your conclusion?
77. Desensitization can be accomplished by:
   A. avoiding the antigen.
   B. injecting IgG antibodies.
   C. injecting small doses of the antigen.
   D. injecting IgE antibodies.

78. A patient with congenital hypogammaglobulinemia lacks B cells. Symptoms of this disease include:
   A. pneumocystis pneumonia.
   B. frequent viral diseases.
   C. cancer.
   D. frequent bacterial diseases.

79. A patient with <200 CD4 cells/cubic millimeter and swollen lymph nodes would be diagnosed with:
   A. category A HIV infection.
   B. AIDS.
   C. category C HIV infection.
   D. category B HIV infection.

80. One week after taking penicillin, a 50-year-old woman experiences bullae (rash) over her entire body. What is your diagnosis?
   A. Localized anaphylaxis.
   B. Cell-mediated hypersensitivity.
   C. Immune complex autoimmunity.
   D. Penicillin is toxic.

81. A skin test is used to detect the presence of:
   A. immune complexes.
   B. antibodies.
   C. antigens.
   D. allergens.

82. AIDS treatments work by targeting all of the following except:
   A. gp120
   B. reverse transcriptase
   C. viral protease
   D. ribosomes
Station 11

Use the pictures and eye at this station to identify the following parts.

83. Sclera
84. Vitreous humour
85. Optic Nerve
86. Iris
87. Lens

Use the brain diagram to identify the following:

88. Pituitary Gland
89. Pons
90. Medulla
91. Occipital Lobe
92. Thalamus
Station 11

Hearing is aided by the cerebrum's...
Both of these pictures are different views of the same thing
Both of these arrows are pointing to the part the pin is going through
Station 11

This arrow is pointing to the thick layer that the pin is sticking through.

This piece has been removed from the inside of the eye for better viewing.
93. The glossopharyngeal nerve relates to
   A. taste buds and hearing.
   B. tongue and pharynx.
   C. touch
   D. eyes and ears.

94. Your temperature, body weight, hunger and body water balance are maintained by your
   A. hypothalamus.
   B. pons
   C. corpus corpora.
   D. temporal lobe.

95. Hair cells detect pressure changes inside the cochlea via a structure called
   A. organ of Corti.
   B. oval window.
   C. vistibulochlear nerve.
   D. medulla

96. Smell is decoded in the temporal lobe of the cerebrum and
   A. thalmus
   B. frontal lobe.
   C. Broca’s area.
   D. papillae.

97. Fear, anger, pleasure, and sorrow are controlled in a ring of tissue called the
   A. pons.
   B. Corpus callosum
   C. hypothalmus.
   D. limbic system.
Station 12

98. Is this a normal EEG?

99. Which of these EEGs shows a person in deep sleep?

100. Neurons with only one dendrite and one axon with the soma in between are known as ______.
    A. Monopolar
    B. Bipolar
    C. Multipolar
101. Motor neurons send nerve impulses from the _________ to the muscles.
   A. Central nervous system
   B. Niggl body
   C. Glial cells
   D. Ganglia

102. A neuron which is not transmitting a nerve impulse is both resting and ___.
   A. Unipolar
   B. Bipolar
   C. Polarized
   D. Unpolarized

103. __________ provide insulation to the axons.
   A. Schwan cells
   B. Neurofibril node
   C. Myelin sheaths
   D. Oligodendrites

104. The peripheral nervous system has 2 divisions called the somatic and the _______ division.
   A. Microgalia
   B. Myelin
   C. Axon
   D. Autonomic

105. A nerve impulse happens at ____________.
   A. Resting potential
   B. Synaptic potential
   C. Active potential
   D. Action potential
Station 13

Match the symptom with the sleep problem.

106. Insomnia  A. Involves going into REM sleep at sleep onset
107. Sleep apnea  B. Involves waking up many times during sleep
108. Narcolepsy  C. Extreme autonomic system arousal; usually occurs in children
109. Sleepwalking  D. Involves trouble falling and staying asleep
110. Night terrors  E. NOT in REM sleep during this behavior; often, but not limited to, children

111. The potential electrical difference in a resting neuron is caused by excess ___ inside the nerve.
    A. Calcium ions
    B. Sodium ions
    C. Potassium ions
    D. Hydroxyl ions

112. ____________ energy provides power to the sodium/potassium pump of the nerve cells.
    A. ADP
    B. ATP
    C. Oxygen
    D. Potential

113. When a nerve is depolarized it is in a(n) ____________ state.
    A. Negative
    B. Active
    C. Resting
    D. Refractory
114. The diagram above shows examples of:
   A. Synapses
   B. Neurilemmas
   C. Glial gaps
   D. Somas

115. The neurotransmitter which activates muscles at the neuromuscular junction is ________.
   A. Acetylcholine
   B. Norepinephrine
   C. Epinephrine
   D. Myelin

116. The primary effectors of nerve activity in the body are ________.
   A. Organs and tissues
   B. Bones and muscles
   C. Axons and dendrites
   D. Glands and muscles
117. When acetylcholine has been released into a synapse it is _____.
   A. Converted to potassium
   B. Converted to sodium
   C. Broken down
   D. Unchanged

118. The left side of the diagram above shows what type of autonomic nervous system?

119. Which side of the diagram (left or right) are responses controlled by the hypothalamus?
Station 14

120. Damage to the patches of myelin can result in _____________.
   A. Epilepsy
   B. Multiple sclerosis
   C. Arthritis
   D. Bipolar disorder

121. A disease characterized by abnormal tissues called senile plaques and neurofibrillary tangles.
   A. Benign senescent forgetfulness
   B. Shingles
   C. Alzheimer's disease
   D. Multi-infarct dementia

122. This man most likely suffers from what nervous system disorder?
123. This picture shows a normal brain and one that is a severe case of what nervous system disorder?

124. This diagram shows children with different severities of what disorder?
Station 14

125. A patient presents with the following symptoms:
   A. Lack of concentration
   B. Fatigue
   C. Depression
   D. Numbness of extremities
   E. Test results show plaque spots on brain and elevated levels of myelin basic protein in the cerebrospinal fluid.

   What does this patient most likely have?

126. Suggest 2 treatments to help this patient.

127. A patient (whose eye is below) comes to you with complaints of loss of peripheral vision. What is your diagnosis?

128. What are 2 treatment options you might suggest?
Station 15

Use the following choices to fill in the blanks: alcohol, caffeine, nicotine and marijuana

129. _______________ is thought to warm the body. However, it actually causes transfer of blood flow from the body core to the extremities and, as such, increases the risk of hypothermia.

130. ______ is commonly consumed to cause a mood of euphoria, relaxation, or increase in appetite.

131. _______________, in its commonly ingested form, is a liquid that is flammable.

132. ________________ is classified as “Generally Recognized As Safe” and may even offer modest protective effects against Parkinson’s Disease.

133. Most common short-term physical and neurological effects of ______________ include increased heart rate, increased appetite and consumption of food, lowered blood pressure, impairment of short-term and working memory, psychomotor coordination, and concentration. It is also linked with diseases of the liver.

134. This diagram shows the effects of what drug?
135. This diagram shows the effects of what drug?

136. This baby’s mother most likely used what substance while pregnant?

Source: www.examiner.com

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Station 5

A

B
Station 5
Anatomy & Physiology – Student Response Sheet

School: ________________________________ V JV1 JV2 JV3 JV4

Student Names: ____________________________

For each answer, fill in the blank or circle the correct response. Please be sure answers are legible and clear.

Station 1

1. __________
2. __________
3. __________
4. __________
5. __________
6. __________
7. __________
8. __________
9. A B C D
10. A B C D
11. A B C D
12. A B C D
13. ____________________________
14. ____________________________

Station 2

15. A B C
16. A B C
17. A B C
18. A B C
19. A B C
20. A B C D
21. A B C D
22. A B C D
23. A B C D
24. A B C D
25. A B C D
26. ____________________________

Station 3

27. A B C D
28. A B C D
29. A B C D
30. A B C D
31. Yes or No
32. ____________________________
33. A B C D
34. Label the diagram below.

Continue on next page.
Station 4

38. A B C D
39. A B C D
40. A B C D
41. A B C D
42. A
43. __________________________________
   __________________________________
   __________________________________

Station 5

44. ___
45. ___
46. ___
47. ___
48. ___
49. ___
50. ___
51. ___
52. ___
53. A B C D

Station 6

54. A B C D
55. A B C D
56. A B C D
57. 

1st ____________________________

2nd ____________________________

3rd ____________________________

Station 7

See crossword puzzle on last page.

Station 8

58. A B C D
59. A B C D
60. A B C D
61. A B C D
62. A B C D
63. A B C D
64. A B C D

Station 9

65. ____________________________
66. ____________________________
67. ____________________________
68. ____________________________
69. ____________________________
70. A B C D
71. A B C D
72. A B C D
73. A B C D
74. A B C D

Station 10

75. ____________ ___________
76. ____________________________
   ____________________________
77. A B C D
78. A B C D
79. A B C D
80. A B C D
81. A B C D
82. A B C D

Continue on next page.
Station 11

83. ______
84. ______
85. ______
86. ______
87. ______
88. ______
89. ______
90. ______
91. ______
92. ______
93. A  B  C  D
94. A  B  C  D
95. A  B  C  D
96. A  B  C  D
97. A  B  C  D

Station 12

98. Yes  or  No
99.  A  B  C  D  E
100. A  B  C
101. A  B  C  D
102. A  B  C  D
103. A  B  C  D
104. A  B  C  D
105. A  B  C  D

Station 13

106. A  B  C  D  E
107. A  B  C  D  E
108. A  B  C  D  E
109. A  B  C  D  E
110. A  B  C  D  E
111. A  B  C  D
112. A  B  C  D
113. A  B  C  D
114. A  B  C  D
115. A  B  C  D
116. A  B  C  D
117. A  B  C  D
118. _____________________________
119. Left  or  Right

Station 14

120. A  B  C  D
121. A  B  C  D
122. _____________________________
123. _____________________________
124. _____________________________
125. _____________________________
126. ________________________________
127. ________________________________
128. ________________________________
Station 15

129.______________________________
130.______________________________
131.______________________________
132.______________________________
133.______________________________
134.______________________________
135.______________________________
136.______________________________
Anatomy & Physiology – ANSWER KEY

For each answer, fill in the blank or circle the correct response. Please be sure answers are legible and clear.

Station 1

27. I
28. A
29. F
30. D
31. C
32. B
33. E
34. J
35. A B C D
36. A B C D
37. A B C D
38. A B C D
39. Stratum Lucideum
40. Dermis

Station 2

41. A B C
42. A B C
43. A B C
44. A B C
45. A B C
46. A B C D
47. A B C D
48. A B C D
49. A B C D
50. A B C D
51. A B C D
52. Pacinian Corpuscle

Station 3

44. A B C D
45. A B C D
46. A B C D
47. A B C D
48. Yes or No
49. Matrix is gone.
50. A B C D
51. Label the diagram below.
52. Vitiligo
53. Sebaceous
54. Sebum

Continue on next page.
Station 4

38. A B C D
39. A B C D
40. A B C D
41. A B C D
42. A B
43. ___ Any 3: Drier skin, thinner, sags, loss of collagen, age spots, wrinkles

Station 5

58. H
59. C
60. A
61. I
62. F
63. D
64. G
65. B
66. E
67. A B C D

Station 6

68. A B C D
69. A B C D
70. A B C D
71.

1st Phys & Chem / skin, stomach acid, mucous, tears

2nd Nonspecific Immune / macrophages, neutrophils, interferons, complement proteins

3rd Specific Immune / T & B cells

Station 7

See crossword puzzle on last page.

Station 8

137. A B C D
138. A B C D
139. A B C D
140. A B C D
141. A B C D
142. A B C D
143. A B C D

Station 9

144. ___ Tonsils
145. ___ Lymph Nodes
146. ___ Spleen
147. ___ Bone Marrow
148. ___ Thymus
149. A B C D
150. A B C D
151. A B C D
152. A B C D
153. A B C D

Station 10

154. ___ D & F
155. ___ They have other risk factors

156. A B C D
157. A B C D
158. A B C D
159. A B C D
160. A B C D
161. A B C D

Continue on next page.
Station 11

185.E
186.C
187.A
188.F
189.B
190.F
191.G
192.H
193.L
194.C
195.A B C D
196.A B C D
197.A B C D
198.A B C D
199.A B C D

Station 12

200. Yes or No
201. A B C D E
202.A B C
203.A B C D
204.A B C D
205.A B C D
206.A B C D
207.A B C D

Station 13

162.A B C D E
163.A B C D E
164. A B C D E
165.A B C D E
166.A B C D E
167.A B C D
168.A B C D
169.A B C D
170.A B C D
171.A B C D
172.A B C D
173.A B C D
174. Parasympathetic
175. Left or Right

Station 14

176.A B C D
177.A B C D
178. Parkinson’s
179. Alzheimer’s
180. Cerebral palsy
181. Multiple Sclerosis
182. Any 2: Physical therapy, injections of interferon beta, injections of corticosteroids
183. Glaucoma
184. Any 2: eye drops, surgery, laser removal
Station 15

208. Alcohol
209. Marijuana
210. Alcohol
211. Caffeine
212. Marijuana
213. Caffeine
214. Marijuana
215. Alcohol