I recommend that you mark answers on the exam form first, then fill out the answer sheet when you have completed the exam. Fill out your answer sheets carefully and avoid erasing answers. You will have the entire class period to complete this exam. Good luck!

A. “Either/Or” Questions (2 points each, 28 points total). Select the correct term of the two provided to make the statement true, and mark the corresponding letter (a or b) on your answer sheet.

1. Most of the hormones produced by endocrine glands are (a. peptides / d. steroids).

2. (a. Glucagon / b. Insulin) increases blood glucose levels.

3. Contraction of a single skeletal muscle fiber to a single brief response is a(n) (a. all-or-none / b. graded) response.

4. Photoreceptors in the retina synapse with (a. ganglion cells / b. bipolar cells).

5. Application of (a. norepinephrine / b. acetylcholine) would cause heat rate to increase.

6. Most of the Ca\textsuperscript{2+} needed for smooth muscle contraction comes from (a. inside / b. outside) the cell.

7. Areas of the body with fine motor control tend to have muscles with (a. many small / b. a few large) motor units.

8. To focus in near objects, the ciliary muscles of the eye (a. contract / b. relax), causing the lens to thicken.

9. Blood pressure in the ventricles is highest during (a. systole / b. diastole).

10. The (a. anterior / b. posterior) lobe of the posterior pituitary contains the axon terminals of neurosecretory cells originating in the hypothalamus.

11. The (a. atrioventricular valves / b. semilunar valves) close at the end of ventricular systole.

12. The (a. left / b. right) side of the heart drives the flow of blood through the systemic circuit.


14. Exchange of materials between blood and interstitial fluid takes place in the (a. arterioles / b. capillaries).
B. Multiple choice questions. Choose the best answer (3 points each, 72 points total).

15. In resting skeletal muscle fibers, ________ covers myosin binding sites on the thin filament, preventing crossbridge formation.
   a) actin             c) troponin
   b) tropomyosin       d) dopamine

16. ________ is a hormone secreted by the anterior pituitary that stimulates the adrenal cortex to produce glucocorticoids.
   a) ACTH (adrenocorticotropic)  c) aldosterone
   b) ADH (antidiuretic hormone)  d) cortisol

17. ________ are lymphocytes that produce antibodies.
   a) macrophages             c) T cells
   b) monocytes               d) B cells

18. What is the cardiac output of an individual with a stroke volume of 80 ml and a heart rate of 75 beats/min?
   a) 155 ml/min            c) 6 L/min
   b) 1.067 L/min           d) 600 ml/min

19. Bilirubin is produced from the ________ of hemoglobin
   a) globin (polypeptide chain)  c) Fe^{2+} ion
   b) heme                          d) none of the above

20. Which of the following hormones is produced by the posterior pituitary?
   a) LH (luteinizing hormone)    c) prolactin
   b) TSH (thyroid stimulating hormone)  d) ADH (antidiuretic hormone)

21. ________ is a hormone produced by the thyroid gland that stimulates removal of Ca^{2+} from the blood.
   a) Calcitonin                c) Parathyroid hormone
   b) Mineralocorticoid          d) GH (growth hormone)

22. Which of the following would decrease cardiac output?
   a) increased sympathetic NS activity
   b) release of epinephrine from the adrenal glands
   c) increased end-diastolic volume
   d) decreased venous return

23. ________ are large blood vessels that transport blood at high speed from the heart.
   a) Arteries                 c) Capillaries
   b) Venules                  d) Veins
24. Unlike other types of muscle fibers, _______ muscle fibers do not have actin and myosin arranged in sarcomeres.
   a) striated    c) smooth
   b) skeletal    d) cardiac

25. ____________ is a hormone produced by the thyroid gland used to control *basal metabolic rate* and heat production by the body.
   a) PTH (parathyroid hormone)  c) cortisol
   b) melatonin                   d) thyroid hormone (thyroxine or triiodothyronine)

26. The sense of *vision* is perceived in the ___________ of the cerebral cortex.
   a) frontal lobe    c) insula lobe
   b) temporal lobe    d) occipital lobe

27. The ___________ of an ECG is associated with *ventricular repolarization*.
   a) P wave    c) S wave
   b) T wave    d) R wave

28. The ___________ of skeletal muscle fibers releases Ca$^{2+}$ inside the cells in response to action potentials.
   a) sarcolemma    c) sarcomere
   b) sarcoplasmic reticulum    d) sarcoma

29. ___________ is an anterior pituitary hormone that stimulates the growth of muscle and bone, and the release of fat from adipose tissue.
   a) thyroxine    c) insulin
   b) adrenocorticotropin    d) growth hormone

30. The lymphatic system returns fluid lost from the blood through ___________ as it passed through the capillaries.
   a) vasoconstriction    c) osmoregulation
   b) vasodilation        d) ultrafiltration

31. ___________ is a pigment in red blood cells that enables them to transport oxygen.
   a) Troponin    c) Hemoglobin
   b) Actin        d) Myoglobin

32. ___________ , which consist of sensory neuron endings wrapped around collagen bundles, help prevent skeletal muscles from contracting too forcefully and damaging their attachment points.
   a) Intrafusal fibers    c) Golgi Tendon Organs
   b) Extrafusal fibers    d) Baroreceptors
33. In smooth muscle contraction, Ca\(^{2+}\) released into the cytosol binds to ____________.
   
   a) calmodulin          c) myosin light chain kinase (MLCK)
   b) troponin            d) myosin

34. The plateau phase of a myocardial action potential is caused by ____________.
   
   a) the flow of K\(^+\) into the cell  c) the flow of Ca\(^{2+}\) into the cell
   b) the flow of Na\(^+\) into the cell  d) the flow of Na\(^+\) out of the cell

35. The outer layer of the eye, made primarily of tough connective tissue, is called the ____________.
   
   a) sclera                    c) choroid
   b) fovea                     d) retina

36. ____________ are granulocytic leukocytes that secrete histamines to induce inflammation.
   
   a) Basophils          c) Eosinophils
   b) Neutrophils        d) Monocytes

37. Which of the following set of terms best describes the rod cells of the retina?
   
   a) color vision, high acuity, low sensitivity
   b) color vision, low acuity, high sensitivity
   c) black/white vision, high acuity, low sensitivity
   d) black/white vision, low acuity, high sensitivity

38. In the path of electrical excitation of the heart, the ____________ conducts electrical depolarization through the interventricular septum.
   
   a) Bundle of His          c) AV node
   b) Bundle of Hers         d) SA node
# Lecture Exam #3 Answers

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>3</td>
<td>A</td>
</tr>
<tr>
<td>4</td>
<td>B</td>
</tr>
<tr>
<td>5</td>
<td>A</td>
</tr>
<tr>
<td>6</td>
<td>B</td>
</tr>
<tr>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>8</td>
<td>A</td>
</tr>
<tr>
<td>9</td>
<td>A</td>
</tr>
<tr>
<td>10</td>
<td>B</td>
</tr>
<tr>
<td>11</td>
<td>B</td>
</tr>
<tr>
<td>12</td>
<td>A</td>
</tr>
<tr>
<td>13</td>
<td>A</td>
</tr>
<tr>
<td>14</td>
<td>B</td>
</tr>
<tr>
<td>15</td>
<td>B</td>
</tr>
<tr>
<td>16</td>
<td>A</td>
</tr>
<tr>
<td>17</td>
<td>D</td>
</tr>
<tr>
<td>18</td>
<td>C</td>
</tr>
<tr>
<td>19</td>
<td>B</td>
</tr>
<tr>
<td>20</td>
<td>D</td>
</tr>
<tr>
<td>21</td>
<td>A</td>
</tr>
<tr>
<td>22</td>
<td>D</td>
</tr>
<tr>
<td>23</td>
<td>A</td>
</tr>
<tr>
<td>24</td>
<td>C</td>
</tr>
<tr>
<td>25</td>
<td>D</td>
</tr>
<tr>
<td>26</td>
<td>D</td>
</tr>
<tr>
<td>27</td>
<td>B</td>
</tr>
<tr>
<td>28</td>
<td>B</td>
</tr>
<tr>
<td>29</td>
<td>D</td>
</tr>
<tr>
<td>30</td>
<td>D</td>
</tr>
<tr>
<td>31</td>
<td>C</td>
</tr>
<tr>
<td>32</td>
<td>C</td>
</tr>
<tr>
<td>33</td>
<td>A</td>
</tr>
<tr>
<td>34</td>
<td>C</td>
</tr>
<tr>
<td>35</td>
<td>A</td>
</tr>
<tr>
<td>36</td>
<td>A</td>
</tr>
<tr>
<td>37</td>
<td>D</td>
</tr>
<tr>
<td>38</td>
<td>A</td>
</tr>
</tbody>
</table>