MATCHING: Match labeled areas with the appropriate terminology from the list below.

Using Figure 14.1, match the following:

1) Myelin sheath.
2) Cell body of ANS preganglionic neuron.
3) Cell body of ANS postganglionic neuron.
4) Cell body of the somatic neuron.

TRUE/FALSE. Answer "A" if the statement is true or "B" if it is false.

5) Because the ANS is a visceral motor system, afferent pathways are of no importance and actually are rarely found.
6) The autonomic nervous system may cause activation or inhibition, depending on the division that is active and the target that is affected.
7) Thermoregulatory responses to increased heat are mediated by the sympathetic nervous division.
8) The adrenal medulla is considered a "misplaced" sympathetic ganglion by some.
9) Most disorders of the autonomic nervous system reflect abnormalities of smooth muscle control.

10) Acetylcholine is the substance released by the axonal endings of the somatic efferent fibers and by the parasympathetic nerve fiber endings.

11) Most body organs are innervated by only the sympathetic division of the nervous system.

12) Through direct neural stimulation, the sympathetic division promotes many metabolic effects via hormone release.

13) Alpha-adrenergic effects are usually stimulatory and mediatory.

14) Cranial nerves VII, IX, and X contain postganglionic fibers of the parasympathetic nervous system.

15) The ANS stimulates smooth and skeletal muscles and glands, whereas the somatic nervous system innervates cardiac muscles only.

16) Norepinephrine-releasing fibers are called cholinergic fibers.

17) Autonomic ganglia are motor ganglia only.

18) The craniosacral division is another name for the parasympathetic division.

19) Most blood vessels are innervated by the sympathetic division alone.

20) The structures that specifically exhibit vasomotor tone are mostly under sympathetic control.

21) Because many of the same cardiac cells are innervated by both parasympathetic and sympathetic fibers, the influence of the two divisions on the heart is synergistic.

22) β-adrenergic receptors are the only receptors found on the heart.

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

23) The secretions of the adrenal medulla act to supplement the effects of ________.
   - A) neurosecretory substances
   - B) vagus nerve activity
   - C) parasympathetic innervation
   - D) sympathetic stimulation

24) Which of the following does not describe the ANS?
   - A) a system of motor neurons that innervates all muscle cells
   - B) a system of motor neurons that innervates smooth and cardiac muscle and glands
   - C) general visceral motor system
   - D) involuntary nervous system
25) The somatic and autonomic nervous systems differ in all of the following except _______.  
A) their efferent pathways  
B) their effectors  
C) to some degree in target responses to their neurotransmitters  
D) all of the neurotransmitters

26) A drug that might be used specifically to reduce heart rate in cardiac patients could be _______.  
A) anticholinesterase  
B) norepinephrine  
C) epinephrine  
D) a beta-blocker

27) Cardiovascular effects of the sympathetic division include all except _______.  
A) dilation of the blood vessels serving the skin and digestive viscera  
B) constriction of most blood vessels  
C) dilation of the vessels serving the skeletal muscles  
D) increase of heart rate and force

28) Over 90% of all parasympathetic fibers are derived from cranial nerve number _______.  
A) VII  
B) X  
C) XII  
D) V

29) The "resting and digesting" division of the autonomic nervous system is the _______.  
A) parasympathetic division  
B) peripheral nervous system  
C) sympathetic division  
D) somatic division

30) Control of temperature, endocrine activity, and thirst are functions associated with the _______.  
A) medulla  
B) hypothalamus  
C) cerebellum  
D) thalamus

31) Which of these effectors is not directly controlled by the autonomic nervous system?  
A) smooth muscle  
B) cardiac muscle  
C) most glands  
D) skeletal muscle

32) Which of the following is not a result of parasympathetic stimulation?  
A) increased peristalsis of the digestive viscera  
B) elimination of urine  
C) salivation  
D) dilation of the pupils

33) Which of the following statements is not true?  
A) Sympathetic ganglia are within a few centimeters of the CNS; parasympathetic are close to visceral organs served.  
B) Sympathetic origin is craniosacral; parasympathetic is thoracolumbar.  
C) Sympathetic division has short preganglionic and long postganglionic fibers; parasympathetic has long preganglionic and short postganglionic fibers.  
D) Sympathetic has extensive branching of preganglionic fibers; parasympathetic has minimal branching of preganglionic fibers.
34) Sympathetic responses generally are widespread because ________.  
   A) preganglionic fibers are short  
   B) NE and epinephrine are secreted into the blood as part of the sympathetic response  
   C) inactivation of ACh is fairly slow  
   D) preganglionic fibers are long

35) Autonomic ganglia contain ________.  
   A) the cell bodies of motor neurons  
   B) synapses between postganglionic fibers and their effectors  
   C) an outer connective tissue capsule around the cell bodies of preganglionic motor neurons  
   D) both somatic afferent and efferent neurons

36) The parasympathetic fibers of the ________ nerves innervate smooth muscles of the eye that cause the lenses to bulge to accommodate close vision.  
   A) abducens  
   B) trochlear  
   C) oculomotor  
   D) optic

37) The parasympathetic tone ________.  
   A) determines normal activity of the urinary tract  
   B) prevents unnecessary heart deceleration  
   C) accelerates activity of the digestive tract  
   D) causes blood pressure to rise

38) Beta-blockers ________.  
   A) have widespread sympathetic effects  
   B) are potent antidepressants  
   C) increase a dangerously low heart rate  
   D) decrease heart rate and blood pressure

39) Which is a uniquely sympathetic function?  
   A) regulation of body temperature  
   B) regulation of cardiac rate  
   C) regulation of respiratory rate  
   D) regulation of pupil size

40) Sympathetic division stimulation causes ________.  
   A) increased blood glucose, increased GI peristalsis, and decreased heart rate and blood pressure  
   B) increased blood glucose, decreased GI peristalsis, and increased heart rate and blood pressure  
   C) decreased blood glucose, increased GI peristalsis, and increased heart rate and blood pressure  
   D) decreased blood glucose, increased GI peristalsis, and decreased heart rate and blood pressure

41) The smooth muscle of the digestive viscera is served largely by the ________.  
   A) pelvic nerves  
   B) lumbar splanchnic nerves  
   C) tenth cranial nerve  
   D) cephalic plexus

42) The route of major parasympathetic outflow from the head is via the ________.  
   A) phrenic nerve  
   B) sacral nerve  
   C) vagus nerve  
   D) sympathetic trunk
43) Parasympathetic functions include ________.
   A) allowing the body to cope with an external threat
   B) lens accommodation for close vision
   C) a stimulation of heart rate and force of contraction
   D) mobilizing storage energy sources

44) Emotions influence autonomic reactions primarily through integration in the ________.
   A) inferior colliculus
   B) lateral horn of the spinal cord
   C) hypothalamus
   D) lateral geniculate of the thalamus

MATCHING: Match labeled areas with the appropriate terminology from the list below.

Using Figure 18.1, match the following:
45) Purkinje fibers.
46) SA node.
47) AV bundle.
48) AV node.
49) Bundle branches.
Using Figure 18.2, match the following:

50) Atrial depolarization.

51) Point after which pressure begins to rise in the aorta.

52) Ventricular repolarization.

53) Point that represents the "dup" sound made by the heart.
Using Figure 18.3, match the following:

54) Ventricular fibrillation.

55) Second-degree heart block.

56) Junctional rhythm.

57) Normal sinus rhythm.
**MATCHING. Choose the item in column 2 that best matches each item in column 1.**

**Match the following:**

<table>
<thead>
<tr>
<th>58) The pacemaker of the heart.</th>
<th>A) Purkinje fibers</th>
</tr>
</thead>
<tbody>
<tr>
<td>59) Found in the interventricular septum.</td>
<td>B) AV node</td>
</tr>
<tr>
<td>60) Network found in the ventricular myocardium.</td>
<td>C) AV bundle</td>
</tr>
<tr>
<td>61) The point in the conduction system of the heart where the impulse is temporarily delayed.</td>
<td>D) SA node</td>
</tr>
</tbody>
</table>

**Match the following:**

<table>
<thead>
<tr>
<th>62) Prevents backflow into the left ventricle.</th>
<th>A) Aortic valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>63) Prevents backflow into the right atrium.</td>
<td>B) Pulmonary valves</td>
</tr>
<tr>
<td>64) Prevents backflow into the left atrium.</td>
<td>C) Mitral valve</td>
</tr>
<tr>
<td>65) Prevents backflow into the right ventricle.</td>
<td>D) Tricuspid valve</td>
</tr>
<tr>
<td>66) AV valve with two flaps.</td>
<td></td>
</tr>
<tr>
<td>67) AV valve with three flaps.</td>
<td></td>
</tr>
</tbody>
</table>
MATCHING: Match labeled areas with the appropriate terminology from the list below.

![Heart Diagram]

**Figure 18.4**

*Using Figure 18.4, match the following:*

68) Tricuspid valve.  
69) Mitral valve.  
70) Right atrium.  
71) Left ventricle.  
72) Pulmonary veins.

**TRUE/FALSE. Answer “A” if the statement is true or “B” if it is false.**

73) Anastomoses among coronary arterial branches provide collateral routes for blood delivery to the heart muscle.  
74) Tissues damaged by myocardial infarction are replaced by connective tissue.  
75) The left side of the heart pumps the same volume of blood as the right.  
76) Chronic release of excess thyroxine can cause a sustained increase in heart rate and a weakened heart.
77) Cardiac muscle has more mitochondria and depends less on a continual supply of oxygen than does skeletal muscle. 77)

78) Arterial blood supply to heart muscle is continuous whether the heart is in systole or diastole. 78)

79) The "lub" sounds of the heart are valuable in diagnosis because they provide information about the function of the heart's pulmonary and aortic valves. 79)

80) An ECG provides direct information about valve function. 80)

81) As pressure in the aorta rises due to atherosclerosis, more ventricular pressure is required to open the aortic valve. 81)

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

82) Normal heart sounds are caused by which of the following events? 82)
   - A) friction of blood against the chamber walls
   - B) opening and closing of the heart valves
   - C) closure of the heart valves
   - D) excitation of the SA node

83) Which of the events below does not occur when the semilunar valves are open? 83)
   - A) Ventricles are in systole.
   - B) Blood enters pulmonary arteries and the aorta.
   - C) AV valves are closed.
   - D) Ventricles are in diastole.

84) The left ventricular wall of the heart is thicker than the right wall in order to ________. 84)
   - A) accommodate a greater volume of blood
   - B) expand the thoracic cage during diastole
   - C) pump blood through a smaller valve
   - D) pump blood with greater pressure

85) The P wave of a normal electrocardiogram indicates ________. 85)
   - A) atrial depolarization
   - B) ventricular depolarization
   - C) ventricular repolarization
   - D) atrial repolarization

86) Small muscle masses attached to the chordae tendineae are the ________. 86)
   - A) venae cavae
   - B) trabeculae carneae
   - C) papillary muscles
   - D) pectinate muscles

87) The term for pain associated with deficient blood delivery to the heart that may be caused by the transient spasm of coronary arteries is ________. 87)
   - A) pericarditis
   - B) ischemia
   - C) myocardial infarct
   - D) angina pectoris
88) To auscultate the aortic semilunar valve, you would place your stethoscope in the ________.
   A) second intercostal space to the right of the sternum  
   B) fifth intercostal space inferior to the left nipple  
   C) fifth right intercostal space  
   D) second intercostal space to the left of the sternum

89) The fact that the left ventricle of the heart is thicker than the right ventricle reveals that it
   ________.
   A) pumps blood against a greater resistance  
   B) expands the thoracic cage  
   C) sends blood through a smaller valve  
   D) pumps a greater volume of blood

90) Norepinephrine acts on the heart by ________.
   A) blocking the action of calcium  
   B) causing threshold to be reached more quickly  
   C) causing a decrease in stroke volume  
   D) decreasing heart contractility

91) Which of these vessels receives blood during ventricular systole?
   A) aorta only  
   B) both the aorta and pulmonary trunk  
   C) pulmonary arteries only  
   D) pulmonary veins only

92) Which of the following is not part of the conduction system of the heart?
   A) bundle of His  
   B) AV node  
   C) SA node  
   D) AV valve

93) The tricuspid valve is closed ________.
   A) by the movement of blood from atrium to ventricle  
   B) when the ventricle is in systole  
   C) while the ventricle is in diastole  
   D) while the atrium is contracting

94) Select the correct statement about the heart valves.
   A) Aortic and pulmonary valves control the flow of blood into the heart.  
   B) The tricuspid valve divides the left atrium from the left ventricle.  
   C) The mitral valve separates the right atrium from the right ventricle.  
   D) The AV valves are supported by chordae tendineae so that regurgitation of blood into the atria during ventricular contraction does not occur.

95) Select the correct statement about the function of myocardial cells.
   A) Each cardiac muscle cell is innervated by a sympathetic nerve ending so that the nervous system can increase heart rate.  
   B) The influx of potassium ions from extracellular sources is the initiating event in cardiac muscle contraction.  
   C) The refractory period in skeletal muscle is much longer than that in cardiac muscle.  
   D) The entire heart contracts as a unit or it does not contract at all.
96) Compared to skeletal muscle, cardiac muscle ________.
   A) has gap junctions that allow it to act as a functional syncytium
   B) lacks striations
   C) cells are larger than skeletal muscle cells
   D) has more nuclei per cell

97) During the period of ventricular filling ________.
   A) pressure in the heart is at its peak
   B) it is represented by the P wave on the ECG
   C) blood flows passively through the atria and the open AV valves into the ventricles
   D) the atria remain in diastole

98) The second heart sound is heard during which phase of the cardiac cycle?
   A) isovolumetric relaxation
   B) ventricular filling
   C) isovolumetric contraction
   D) ventricular ejection

99) Select the correct statement about cardiac output.
   A) A slow heart rate increases end diastolic volume, stroke volume, and force of contraction.
   B) Stroke volume increases if end diastolic volume decreases.
   C) If a semilunar valve were partially obstructed, the end systolic volume in the affected ventricle would be decreased.
   D) Decreased venous return will result in increased end diastolic volume.

100) Isovolumetric contraction ________.
     A) occurs immediately after the aortic and pulmonary valves close
     B) refers to the short period during ventricular systole when the ventricles are completely closed chambers
     C) occurs while the AV valves are open
     D) occurs only in people with heart valve defects