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# PSL 131 MIDYEAR EXAM

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## 1<sup>st</sup> Semester 1429-1430 (2008-2009)

1. The most likely cause of fecal incontinence in elderly people is:
  - A. Increased tone of internal anal sphincter muscle.
  - B. Damage of enteric nervous system in the distal colon.
  - C. Weakness in external anal sphincter muscle and puborectalis muscle.
  - D. Increased propulsive movement in rectum.
  - E. None of the above is correct.
2. Primary bile acids:
  - A. Are completely lost in the feces during meal.
  - B. Are synthesized from phospholipids.
  - C. Are reabsorbed in the cecum.
  - D. Are converted into secondary bile acids in the small intestine.
  - E. Are deconjugated in the liver.
3. Cholecystokinin (CCK) inhibits:
  - A. Relaxation of the sphincter of Oddi.
  - B. Contraction of the gallbladder wall.
  - C. Gastric emptying.
  - D. Bile reabsorption.
  - E. Pyloric contraction.
4. Micelle formation is necessary for the intestinal absorption of:
  - A. Galactose.
  - B. Bile acids.
  - C. Amino acids.
  - D. Nucleic acids.
  - E. Fatty acids.
5. A disease that results in the loss of myenteric inhibitory motor neurons to the musculature will be expressed as:
  - A. Diarrhea.
  - B. Migrating motor complex.
  - C. Achalasia of the lower esophageal sphincter.
  - D. Gastroesophageal reflux.
  - E. None of the above is correct.
6. Lactase hydrolyzes lactose to:
  - A. Glucose and galactose.
  - B. Glucose.
  - C. Glucose and fructose.
  - D. Galactose and fructose.
  - E. Fructose.

7. Glucose and galactose are absorbed in the basolateral membrane via:
- Primary active transport.
  - Facilitated diffusion.
  - Passive diffusion.
  - Coupling to sodium.
  - None of the above is correct.
8. Bile salts:
- Are formed from fatty acids.
  - Are essential for vitamin B<sub>12</sub> absorption.
  - Activate trypsinogen.
  - Are essential for carbohydrate digestion.
  - Have enterohepatic circulation.
9. Which one of the following cell types secretes intrinsic factor?
- G cells.
  - Mucous neck cells.
  - Parietal cells.
  - Pancreatic acinar cells.
  - Peptic cells.
10. The brush border of intestinal cells contains all of the following enzymes, **EXCEPT**:
- Peptidase.
  - Maltase.
  - Pepsin.
  - Lactase.
  - Sucrase.
11. Contraction of the lower esophageal sphincter:
- Occurs during swallowing.
  - Is stimulated by secretin.
  - Prevents reflux of gastric contents.
  - Does not occur in Achalasia.
  - Is inhibited by gastrin.
12. The slow waves of gastrointestinal tract:
- Are initiated by interstitial cells of Cajal.
  - Have high amplitude by the effect of norepinephrine.
  - Cause a direct smooth muscle contraction.
  - Have a frequency of 3-4/min in the duodenum.
  - Always accompanied by an action potential.
13. The pharyngeal phase of swallowing:
- Is controlled by the vagus nerve.
  - Starts when food reaches the esophagus.
  - Can be voluntarily inhibited.
  - Is preceded by the esophageal phase.
  - Is followed by the relaxation of the upper esophageal sphincter.

14. Enterokinase:
- A. Prevents trypsin from being activated.
  - B. Digests carbohydrates.
  - C. Decreases gastric secretion.
  - D. Is secreted from the enterocytes.
  - E. Activates pepsinogen.
15. Bilirubin:
- A. Conjugates with glycine or taurine in the liver.
  - B. Has normal level of 2-3 mg/dl.
  - C. The unconjugated form is water-soluble.
  - D. Is one of the end products of heme degradation.
  - E. Is essential for vitamin K absorption.
16. Acid secretion in the stomach:
- A. Occurs by passive diffusion of  $H^+$  ions into gastric lumen.
  - B. Can be stimulated by histamine through  $H_1$  receptors.
  - C. Can be inhibited by gastrin.
  - D. Is a function of parietal cells.
  - E. None of the above.
17. Dietary lipid is absorbed by the small intestine and transported in the lymph mainly as:
- A. Cholesterol.
  - B. Free fatty acid.
  - C. Triglycerides.
  - D. Phospholipids.
  - E. Chylomicrons.
18. Which one of the following is characteristic of saliva:
- A. Secretion rate is increased by vagotomy (cutting the vagus nerve).
  - B. Modification by the salivary ductal cells involves secretion of  $K^+$  and  $HCO_3^-$ .
  - C. Isotonicity relative to plasma.
  - D. Hypertonicity relative to plasma.
  - E. Increased flow rate decreases  $Na^+$  concentration.
19. In ECG:
- A. QRS complex is due to ventricular repolarization.
  - B. T wave is normally inverted in lead II.
  - C. U wave occurs in hypokalemia.
  - D. P wave is due to atrial contraction.
  - E. Normal axis is minus 60 degree.
20. R-P interval:
- A. Is measured from the beginning of P wave to peak of R wave.
  - B. Is measured from the beginning of P wave to beginning of Q wave.
  - C. Is normally more than 0.3 seconds.
  - D. When 0.12 seconds, signifies first degree heart block.
  - E. Is due to atrial repolarization.

21. Gap junctions:
- A. Are absent in cardiac muscle.
  - B. Are of little importance in cardiac muscle.
  - C. Provide pathway for rapid spread of excitation.
  - D. Are not present in Purkinje fibers.
  - E. Are not responsible for syncytial function of the cardiac muscle.
22. If the atrioventricular node become the pacemaker of the heart, what is the expected heart rate?
- A. 20 beats/min.
  - B. 70 beats/min.
  - C. 80 beats/min.
  - D. 45 beats/min.
  - E. 100 beats/min.
23. The fourth heart sound is caused by:
- A. Closure of aortic and pulmonary valves.
  - B. Vibration on the ventricular wall during systole.
  - C. Closure of mitral and tricuspid valves.
  - D. Atrial contraction leading to ventricular late filling.
  - E. Retrograde (backflow) to the superior vena cava.
24. Which one of the following has the slowest rate of conduction?
- A. Atrial muscle.
  - B. Internodal pathway.
  - C. Purkinje fibers.
  - D. AV-node.
  - E. Ventricular muscle.
25. The second heart sound:
- A. Is due to closure of mitral and tricuspid valves.
  - B. Is recorded during maximum filling phase.
  - C. Is short and sharp as compared to the first heart sound.
  - D. Starts with isovolumetric contraction phase.
  - E. Coincides with QRS complex of ECG.
26. The right ventricular systolic pressure is about:
- A. 120 mmHg.
  - B. 80 mmHg.
  - C. 25 mmHg.
  - D. 10 mmHg.
  - E. 100 mmHg.
27. End diastolic volume:
- A. Is the volume of blood in the ventricle at the end of systole.
  - B. Decrease during ventricular diastole.
  - C. Is about 110-120 ml.
  - D. Decreases when venous return increases.
  - E. Does not affect the stroke volume.

28. If the diameter of an arteriole is doubled, its resistance will decrease by:
- 2 times.
  - 4 times.
  - 3 times.
  - 16 times.
  - 8 times.
29. If oxygen consumption of a person = 200 ml/minute, arterial O<sub>2</sub> conc. = 100 ml/L and mixed venous O<sub>2</sub> conc. = 100 ml/L.  
His cardiac output would be equal to:
- 5 L/min.
  - 4 L/min.
  - 2.5 L/min.
  - 3 L/min.
  - 10 L/min.
30. During muscular exercise cardiac output is increased by all of the following, **EXCEPT**:
- Increased stroke volume.
  - Tachycardia.
  - Increased cardiac contractility.
  - Increased muscle contraction.
  - Increased blood viscosity.
31. All of the following are produced locally in tissues and regulate perfusion, **EXCEPT**:
- Lactic acid.
  - Nitric oxide.
  - Prostaglandin.
  - Carbon dioxide.
  - Nor-epinephrine.
32. During the compensatory phase of shock, which one of the following does not occur?
- Tachycardia.
  - Increased sympathetic activity.
  - Venodilation.
  - Vasoconstriction.
  - Angiotensin II formation.
33. Oedema may result from all of the following conditions, **EXCEPT**:
- Increase in venous pressure.
  - Obstruction of lymphatic vessels.
  - Increase in capillary permeability.
  - Increase in hydrostatic pressure.
  - Increase in plasma protein.
34. Long term regulation of high arterial pressure:
- Increase baroreceptors activity.
  - Increase secretion of antidiuretic hormone.
  - Increase secretion of aldosterone hormone.
  - Increase Angiotensin II hormone secretion.
  - Decrease renin secretion by the kidneys.

35. Baroreceptors are not involved in long-term regulation of blood pressure because they:
- A. Respond only to a mean blood pressure of 60 mmHg or below.
  - B. Respond only to a mean blood pressure above 200 mmHg.
  - C. Are rapidly adapting receptors.
  - D. Are slowly adapting receptors.
  - E. None of the above is correct.
36. The most effective coronary vaso dilator is:
- A. Decreased  $K^+$  ions.
  - B. Lactic acid.
  - C. Adenosine.
  - D. Increased oxygen.
  - E. Increased hydrogen ions.
37. Parasympathetic stimulation leads to:
- A. Bronchodilation.
  - B. Decreased intestinal motility and secretion.
  - C. Increased force of cardiac contraction.
  - D. Decreased urine secretion.
  - E. Increased overall salivary secretion.
38. Autonomic nervous system:
- A. Innervates organs whose functions are usually under voluntary control.
  - B. Release only stimulatory neurotransmitter.
  - C. Preganglionic cell bodies lie inside the brain and spinal cord.
  - D. Presynaptic neuron is unmyelinated.
  - E. Postsynaptic neuron lies away from the effector organ.
39. About sympathetic nervous system:
- A. It has craniosacral origin.
  - B. The autonomic ganglia lie on or near the effector organ.
  - C. Essential chemical messenger is norepinephrine.
  - D. Facilitate the conservation of body energy.
  - E. Has "rest and digest" activity.
40. Flight or fight can lead to the following, **EXCEPT**:
- A. Decreased heart rate, force of contraction.
  - B. Improve blood flow to skeletal and cardiac muscle.
  - C. Increase respiratory rate.
  - D. Convert glycogen to glucose.
  - E. Dilation of the pupil.
41. The cross bridges:
- A. Have great affinity to calcium.
  - B. Have great affinity to troponin.
  - C. Inhibited by troponin-tropomyosin during relaxation.
  - D. Detached from actin during contraction.
  - E. None of the above is correct.

42. Power stroke can be initiated by:
- Binding of troponin to tropomyosin.
  - Binding of cross bridges to actin active sites.
  - Calcium pump into sarcoplasmic reticulum.
  - Sliding of actin over myosin.
  - Shortening of sarcomere.
43. During skeletal muscle relaxation there is:
- Inward spread of the depolarization wave along T-tubules.
  - Pumping of  $Ca^{++}$  back into the sarcoplasmic reticulum.
  - Release of  $Ca^{++}$  from the sarcoplasmic reticulum.
  - Binding of  $Ca^{++}$  to troponin.
  - Sliding of actin over myosin.
44. The strong affinity of troponin to calcium can initiate:
- Skeletal muscle relaxation.
  - Breakdown of troponin-tropomyosin complex.
  - End plate potential.
  - Calcium dependant exocytosis of acetylcholine.
  - Spread of action potential in T-tubules.
45. Acetylcholine esterase enzyme inactivation occurs by:
- Adrenaline which inactivates it weeks.
  - Neostigmine which inactivates it temporary.
  - Acetylcholine, which inactivates it or minutes.
  - Nicotine inactivates it permanently.
  - Di-isopropyl fluorophosphate inactivates it for seconds.
46. In the nerve terminal:
- Calcium enters the presynaptic membrane before nerve impulse.
  - Calcium enters the presynaptic membrane after Ach release.
  - Calcium do not enter the presynaptic membrane.
  - Ach vesicles rupture by calcium entry in presynaptic membrane.
  - Ach gated channels open by calcium in presynaptic membrane.
47. At overshoot of the nerve action potential:
- All  $K^{+}$  channels close.
  - All  $Na^{+}$  channels open.
  - All  $Na^{+}$  channels close.
  - All  $Cl^{-}$  channels open.
  - All of the above are correct.
48. Propagation of a nerve action potential:
- Occurs by local circuits in the myelinated nerves.
  - Is faster in the unmyelinated nerves.
  - Occurs by salutatory conduction in the myelinated nerves.
  - Does not need energy.
  - None of the above is correct.

49. Blood platelets:
- A. Aggregation is stimulated by ADP.
  - B. Secrete thromboxane  $A_2$ .
  - C. Aggregation is inhibited by aspirin.
  - D. Aggregation stops bleeding from capillaries.
  - E. All of the above statements are correct.
50. Regarding erythropoiesis:
- A. RBCs are formed in the liver at adolescence.
  - B. Deficiency of vitamin  $B_{12}$  results in microcytic anemia.
  - C. Iron is essential for RBC formation.
  - D. At high altitude RBC formation slows down.
  - E. Vitamin K is an important factor for erythropoiesis.
51. Thrombin:
- A. Can activate platelets.
  - B. Present in the circulation as inactive precursor, prothrombin.
  - C. Changes fibrinogen to insoluble fibrin.
  - D. Is activated by active factor X.
  - E. All of the above is correct.
52. In the intrinsic pathway of coagulation:
- A. Activated factor X activates factor IX directly.
  - B. Activation of factor VIII is the starting step.
  - C. Is not needed for clot formation outside of the body.
  - D. Factor X is activated by activated factor IX, VIII, platelet phospholipids and calcium.
  - E. Activation of factor X is not affected in hemophilia.
53. Regarding mechanism of blood coagulating:
- A. Factor VII is essential for the extrinsic pathway.
  - B. Factor X is activated by both intrinsic and extrinsic pathways.
  - C. Heparin inhibits thrombin.
  - D. Removal of calcium ion from the blood inhibits clot formation.
  - E. All of the above are correct.
54. In the natural immunity against infections:
- A. T lymphocytes are responsible for antibody production.
  - B. Phagocytic cells are the key player.
  - C. Lymphocytes are responsible for cell immunity.
  - D. T cytotoxic are potent phagocytes.
  - E. None of the above is true.
55. Eosinophils:
- A. Play a role in the formation of blood clots.
  - B. Are powerful phagocytic cells.
  - C. Number increase markedly in allergic condition.
  - D. Secrete lymphokines.
  - E. Secrete thromboxane  $A_2$ .



56. Pernicious anemia results from:
- A. Iron deficiency.
  - B. Folic acid deficiency.
  - C. Intrinsic factor deficiency.
  - D. Vitamin B<sub>12</sub> deficiency.
  - E. Amino acid deficiency.
57. Regarding facilitated diffusion all of the following are true, **EXCEPT**:
- A. A downhill process.
  - B. Helps large molecule ions to diffuse across the cell membrane.
  - C. A transport process coupled directly to a continuous supply of ATP.
  - D. Movement of ions in the direction of their electrochemical gradient.
  - E. A process that always needs carrier protein to help it.
58. Which one of the following indicators is used to measure the volume of total body water?
- A. Thiosulfate.
  - B. Evan's blue dye.
  - C. Deuterium oxide (heavy water).
  - D. Radioactive chromium.
  - E. Inulin.
59. Shrinking of red blood cells volume occurs when it is placed in:
- A. 9% NaCl solution.
  - B. Hypotonic saline.
  - C. Isotonic saline.
  - D. 25% glucose solution.
  - E. Both A and D.
60. Which one of the following transport processes depends primarily on ATP?
- A. Counter transport of hydrogen ions.
  - B. Primary active transport.
  - C. Facilitated diffusion.
  - D. Simple diffusion.
  - E. Both A and D.