

八十六學年度輻射生物研究所系(所) \_\_\_\_\_ 組碩士班研究生入學考試

科目 生理學 科號 4106 共 7 頁第 1 頁 \*請在試卷【答案卷】內作答

共 50 題單選題

每題 2 分，答錯倒扣 0.5 分

1. All arteries in the body contain oxygen-rich blood EXCEPT
  - a. the aorta
  - b. the pulmonary artery
  - c. the renal artery
  - d. the coronary artery
2. The cells that normally have the fastest rate of spontaneous diastolic depolarization are located in
  - a. the SA node
  - b. the AV node
  - c. the bundle of His
  - d. the Purkinje fibers
3. The activation of coagulation factor X is
  - a. part of the intrinsic pathway only
  - b. part of the extrinsic pathway only
  - c. part of both the intrinsic and extrinsic pathway
  - d. not part of either intrinsic or extrinsic pathway
4. Antibodies against both type A and type B antigens are found in the plasma of a person who is
  - a. type A
  - b. type B
  - c. type AB
  - d. type O
5. Both antidiuretic hormone and aldosterone act to
  - a. increase urine volume
  - b. increase blood volume
  - c. increase total peripheral resistance
  - d. all of above
6. An increase in blood volume will cause
  - a. a decrease in antidiuretic hormone secretion
  - b. an increase in  $\text{Na}^+$  excretion in the urine
  - c. a decrease in renin secretion
  - d. all of above
7. Blood pressure is lowest in the
  - a. arterioles
  - b. capillaries
  - c. venules
  - d. veins
8. If the blood lacked red blood cells but the lungs were functioning normally
  - a. the arterial  $\text{PO}_2$  would be normal
  - b. the oxygen content of arterial blood would be normal
  - c. both a and b
  - d. neither a nor b

八十六學年度精射生物研究所系(所) \_\_\_\_\_ 組碩士班研究生入學考試

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9. If a person with normal function were to hyperventilation for several seconds, there would be a significant
  - a. increase in the arterial  $PO_2$
  - b. decrease in the arterial  $PO_2$
  - c. increase in the % of  $O_2$  saturation
  - d. decrease in the arterial pH
10. The affinity of hemoglobin for  $O_2$  is decreased under conditions of
  - a. acidosis
  - b. at a high altitude
  - c. anemia
  - d. all of above
11. Antidiuretic hormone promotes the retention of water by stimulating the
  - a. active transport of water
  - b. active transport of chloride
  - c. active transport of sodium
  - d. permeability of the collecting duct to water
12. Which of the following factors OPPOSES filtration from glomerulus?
  - a. plasma hydrostatic pressure
  - b. hydrostatic pressure in Bowman's capsule
  - c. glomerular capillary blood pressure
  - d. all of above
13. The kidneys help maintain acid-base balance by
  - a.  $K^+/H^+$  exchange in the distal regions of the nephron
  - b. the action of carbonic anhydrase within the tubule cells
  - c. the buffering action of phosphate and ammonia in the urine
  - d. all of above
14. Most digestion occurs in the
  - a. mouth
  - b. stomach
  - c. small intestine
  - d. large intestine
15. During the gastric phase, the secretion of HCl and pepsinogen is stimulated by
  - a. vagus nerve stimulation
  - b. polypeptides in the gastric lumen and gastrin secretion
  - c. CCK secreted from the duodenum
  - d. all of above
16. Normally the esophagus is
  - a. relaxed and open at both ends
  - b. closed at the stomach end only
  - c. closed at the oral end only
  - d. contracted throughout its length
  - e. closed at both ends

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17. During exposure to the sun in a hot desert, sweating can be kept to a minimum by
- wearing as much black clothing as possible
  - removing clothing and walking slowly
  - sitting quietly and clothed
  - sitting quietly and unclothed
  - walking clothed
18. The secretion of HCl by the stomach mucosa is inhibited by
- neural reflexes from the duodenum
  - the secretion of gastric inhibitory peptide from the duodenum
  - the lowering of gastric pH
  - all of above
19. Absorption of salt and water is the principal function of which region of the GI tract?
- stomach
  - duodenum
  - small intestine
  - large intestine
20. Which of the following cells help the activation of lymphocytes by antigens?
- macrophages
  - neutrophils
  - natural kill T cells
  - platelets
21. The corpus luteum is maintained for the first ten weeks of pregnancy by
- hCG
  - LH
  - estrogen
  - progesterone
22. A person with the genotype XO has
- ovaries
  - testes
  - both ovaries and testes
  - neither ovaries nor testes
23. An embryo with the genotype XX develops female sex accessory organs because of
- androgens
  - estrogens
  - absence of androgens
  - absence of estrogens
24. Fertilization normally occurs in
- the ovaries
  - the fallopian tubes
  - the uterus
  - the vagina



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31. The movement of water across a cell membrane occurs by
- active transport
  - facilitated transport
  - simple diffusion
  - none of above
32. Which of the following statements about the facilitated diffusion of glucose is true
- require energy from ATP
  - this is an example of co-transport
  - a carrier protein in the membrane is required
  - the transport is against a chemical gradient of glucose
33. Ketone bodies are derived from
- fatty acids
  - glycerol
  - glucose
  - amino acids
34. Which of the following is NOT a characteristic of action potentials?
- they are produced by voltage-regulated gates
  - they are conducted without decrement
  - $\text{Na}^+$  and  $\text{K}^+$  gates open at the same time
  - the membrane potential reverses polarity during depolarization
35. A collection of neuron cell bodies located outside the CNS is called a
- tract
  - nerve
  - nucleus
  - ganglion
36. Which of the following organs has an almost absolute requirement for blood glucose as its energy source? The
- liver
  - brain
  - skeletal muscles
  - heart
37. Depolarization of an axon is produced by
- inward diffusion of  $\text{Na}^+$
  - active extrusion of  $\text{K}^+$
  - outward diffusion of  $\text{K}^+$
  - inward active transport of  $\text{Na}^+$
38. A lowering of blood glucose promotes
- decreased lipogenesis
  - increased glycogenolysis
  - increased amino acid secretion
  - all of above

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39. As the strength of depolarizing stimulus to an axon is increased
- the amplitude of action potentials increases
  - the duration of action potentials increases
  - the speed of conduction of action potentials increases
  - the frequency with which action potentials are produced increases
40. The conversion of glycogen to glucose-6-phosphate occurs in the
- skeletal muscles
  - liver
  - both a and b
  - none of above
41. The formation of glucose from pyruvic acid that is derived from lactic acid, amino acids, or glycerol is called
- glycogenesis
  - glycogenolysis
  - glycolysis
  - gluconeogenesis
42. Elevated temperature in adult human patient are due to
- excessive heat production due to restlessness
  - failure of heat loss
  - sympathetic excitation of sweat production
  - irregularity of central thermal control mechanism
  - slowed parasympathetic activity
43. The most important central mechanism for temperature regulation is contained in the
- pituitary
  - cerebellum
  - medulla
  - hypothalamus
  - pineal glands
44. The sugar normally found in significant amounts in intestinal chyme includes
- glucose and fructose
  - mannose and ribose
  - galactose and xylose
  - mannose and xylose
  - ribose and xylose
45. Blood flow is regulated largely by local metabolic effects in
- kidney
  - skin
  - liver
  - brain
  - muscle
46. Parathyroid hormone
- is released when serum calcium is too high
  - inactivates vitamin D
  - works in the same direction as thyrocalcitonin
  - depends on vitamin K for adequate activity
  - is secreted if serum calcium is too low

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47. The portion of circulatory system with the largest total cross-sectional area is the
- large veins
  - large arteries
  - small veins
  - arterioles
  - capillaries
48. Compensated respiratory acidosis is characterized by
- increase in pH
  - decrease in pH
  - increase in sodium chloride
  - increase in sodium bicarbonate
  - decrease in sodium bicarbonate
49. Loss of pituitary function would be associated with
- early bone maturation
  - decreased sensitivity to insulin
  - increased protein synthesis
  - normal neonatal growth
  - none of the above
50. Which of the following does NOT happen during maximal exercise
- there is a net increase in total vascular volume
  - cardiac output increase less than respiratory minute volume
  - pulmonary diffusion capacity increases
  - expiration becomes an active event
  - body temperature raises