

八十六學年度 生命科學 系(所) 分生組甲
生醫組甲 組碩士班研究生入學考試
科目 生理學 科號 0903
1203 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(請將答案寫在
選擇題答案格內)

1. In fatty acid metabolism, which of the following enters the Krebs cycle
 - a. keto acids
 - b. acetyl CoA
 - c. pyruvic acids
 - d. lactic acids
2. Glucose can be secreted into the blood by the
 - a. liver
 - b. muscles
 - c. brain
 - d. a and b
3. When a skeletal muscle shortens during contraction, which of the following statement is FALSE?
 - a. the A bands shorten
 - b. the H bands shorten
 - c. the I bands shorten
 - d. the sarcomeres shorten
4. Electrical excitation of a muscle most DIRECTLY causes the
 - a. movement of tropomyosin
 - b. attachment of the cross-bridges to actin
 - c. release of Ca^{++} from the sarcoplasmic reticulum
 - d. hydrolysis of ATP
5. The energy for muscle contraction is most DIRECTLY obtained from
 - a. phosphocreatine
 - b. ATP
 - c. fatty acids
 - d. glucose
6. Which of the following is NOT a characteristic of graded potentials?
 - a. they are all-or-none in amplitude
 - b. they decrease in amplitude with distance
 - c. they are produced in dendrites and cell bodies
 - d. they are graded in amplitude
7. A drug that inactivates acetylcholinesterase
 - a. inhibits the release of ACh from presynaptic endings
 - b. inhibits the attachment of ACh to its receptor
 - c. increases the ability to stimulate muscle contraction
 - d. all of above

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8. The summation of EPSPs from many presynaptic nerve fibers converging onto one postsynaptic neuron is called
- spatial summation
 - post-tetanic potential summation
 - temporal summation
 - synaptic potential summation
9. Repolarization of an axon during an action potential is produced by
- inward diffusion of Na^+
 - active extrusion of K^+
 - outward diffusion of K^+
 - inward active transport of Na^+
10. The conduction of action potential in a myelinated nerve fiber is
- saltatory
 - without decrement
 - faster than in an unmyelinated fiber
 - all of above
11. Which of the following statements about cross-bridges is FALSE?
- they are composed of myosin
 - they bound to ATP after they detach from actin
 - they contain an ATPase
 - they hydrolyze ATP before they attach to actin
12. When a muscle is stimulated to contract, Ca^{++} binds to
- myosin
 - tropomyosin
 - actin
 - troponin
13. The insulin
- is secreted by alpha cells
 - stimulates the production of glycogen and fat
 - is secreted in response to a rise in blood glucose
 - b and c
14. The neuroglial cells that form myelin sheath in the peripheral nervous system are
- oligodendrocytes
 - satellite cells
 - Schwann cells
 - microglia

- 15. Heparin prevents clotting primarily because it
 - a. dissolve fibrinogen
 - b. blocks conversion of prothrombin to thrombin
 - c. inactivates prothrombin
 - d. chelates calcium
 - e. blocks the action of thrombin

- 16. In water intoxication, the extra volume of water is predominantly
 - a. located in intravascular compartment
 - b. located in the intracellular compartment
 - c. located in the interstitial compartment
 - d. evenly distributed in all compartments
 - e. located in transvascular (as GI and CSF) compartment

- 17. Gallbladder function includes all of the following EXCEPT
 - a. equalization of pressure in bile duct system
 - b. reduction of alkalinity of bile pH
 - c. bile secretion
 - d. concentration of bile fluid
 - e. fluid reabsorption

- 18. Heat stroke is primarily caused by
 - a. excessive heat production
 - b. the inability to sweat
 - c. conductive heat gain
 - d. inability to lose heat by radiation
 - e. too much clothing

- 19. During the short-term (2 min) maximum exercise event an oxygen debt happens
 - a. at a constant rate during exercise
 - b. primarily after stopping exercise
 - c. because aerobic energy production is insufficient
 - d. primarily before starting exercise
 - e. when the blood pressure exceeds 200 mm Hg

- 20. The most likely humoral mediator of painful sensation from most tissue is
 - a. a gamma-aminobutyric acid (GABA)
 - b. bradykinin
 - c. histamine
 - d. acetylcholine
 - e. antihistamine

- 21. The visual cortex has
 - a. simple cell
 - b. complex cells
 - c. hypocomplex cells
 - d. distance cells
 - e. bipolar cells

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22. Man is unable to digest dietary
- glucose
 - dextrin
 - saccharose
 - cellulose
 - glycogen
23. Pancreatic juice contains
- chymotrypsin, trypsinogen, lipase
 - chymotrypsin, lipase
 - enterokinase, trypsinogen
 - enterokinase
 - all of above
24. The GI tract is an important route to excretion of endogenous
- galactose, potassium, calcium
 - galactose, calcium
 - potassium, bilirubin
 - bilirubin
 - all of above
25. The normal fluidity of circulating blood is probably maintained by
- plasmin, plasma antithromboplastin, plasma antithrombin,
 - plasmin, plasma antithrombin
 - plasma antithromboplastin, heparin
 - heparin
 - all of above
26. The collecting ducts are the site of fluid adjustment of urinary
- sodium, potassium, water
 - sodium, water
 - potassium, pH
 - pH
 - all of above
27. The vomiting center is located in the
- cerebral cortex
 - thalamus
 - hypothalamus
 - medulla oblongata
 - cervical spinal cord
28. Which of the following hormones is under inhibitory control by hypothalamus
- ACTH
 - prolactin
 - follicle stimulating hormone
 - thyroid stimulating hormone
 - luteinizing hormones

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29. Most of the venous CO_2 is in the form of
- carbonate
 - carbonic acid
 - bicarbonate
 - dissolved CO_2
 - carbamino compounds
30. Pressure in the alveolar space is
- subatmospheric at the end of inspiration
 - dependent upon airway dimensions and direction of airflow
 - largely determined during airflow by resistance of alveolar ducts
 - less than atmospheric pressure during expiration
 - independent of airflow direction and airway dimension
31. In respiratory alkalosis
- pCO_2 rises
 - pCO_2 falls
 - pCO_2 remains the same
 - protein synthesis increases
 - the H^+ concentration increases
32. Metabolic acidosis may be caused by
- loss of CO_2 by increased ventilation
 - retention of CO_2 due to respiratory obstruction
 - persisting vomiting
 - absorption of excessive amount of sodium bicarbonate
 - none of above
33. In contrast to systemic circulation, the pulmonary circulation is characterized by
- low mean pressure
 - high resistance
 - relative small pulse pressure
 - large volume flow per minute
 - absence of sympathetic control
34. Net movement of solutes particles from the plasma of the renal glomerulus to the fluid in the Bowman capsule could best be described as
- diffusion
 - active transport
 - renal flow
 - osmosis
 - bulk flow
35. The normal pH of the blood is within the range of
- 6.8-7.0
 - 7.0-7.1
 - 7.1-7.3
 - 7.3-7.5
 - 7.5-7.6

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36. Thyroid hormone stored in the lumen of follicles is in the form of
- T₃
 - T₄
 - thyropectin
 - thyroglobulin
 - triiodothyronine
37. The hormone with the shortest half-life in the blood in the following list is
- insulin
 - ACTH
 - epinephrine
 - acetylcholine
 - T₃
38. Urinary 17-ketosteroids
- are not found in woman
 - indicate the total production of sex hormones
 - reflect the total production of androgenic substances
 - include testosterone
 - are highly active androgens
39. ACTH is most effective in stimulating the secretion of
- cortisone
 - aldosterone
 - norepinephrine
 - adrenal androgenic hormones
 - hydrocortisone
40. The development of normal lactation depends on adequate amount of all the following EXCEPT
- prolactin
 - growth hormones
 - oxytocin
 - T₃
 - androgens
41. The hormone measured in urine to test for pregnancy is
- pituitary LH
 - progesterone
 - androgen
 - FSH
 - chorionic gonadotropin
42. If a person presents with a very regular 29-day menstrual cycle, ovulation should occur on day
- 15
 - 16
 - 17
 - 19
 - 29

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43. The hypothalamus of the mammal is required for
- homeostasis of body temperature
 - perception of odor
 - synthesis of anterior pituitary hormones
 - blood pressure homeostasis
 - rhythmic breathing
44. Normally, if the venous pressure increases by 8 mmHg, the capillary pressure
- will not change
 - decreases by 6 mmHg
 - decreases by 8 mmHg
 - increases by 8 mmHg
 - increases markedly
45. Autoregulation of blood flow involves the maintenance of a relatively constant
- blood flow over a range of blood pressure
 - blood flow while resistance is changing
 - blood pressure during variation of blood flow
 - resistance in the face of changing blood pressure
 - heart rate in the face of changing blood pressure
46. Following pancreatectomy, one would expect a rise in the plasma concentration of all of the following EXCEPT
- estrogen
 - glucose
 - lipoprotein
 - free fatty acid
 - acetoacetic acid
47. Within physiologic limits, an increase in right atrial pressure
- decrease systemic arterial pressure
 - decrease intrathoracic pressure
 - increase systemic arterial pressure
 - decrease heart rate
 - decrease renal blood flow
48. Gastric secretion is
- stimulated by norepinephrine
 - not affected by the presence of blood in the stomach
 - increased by stomach distention
 - stimulated by an increase in phonic activity
 - none of the above
49. Vitamin D is essential for normal
- ADH secretion
 - fat absorption
 - protein absorption
 - calcium absorption
 - glucose absorption
50. Increasing radius from 1 cm to 2 cm should cause resistance to flow to
- half
 - increase 2 times
 - increase 4 times
 - decrease 4 times
 - decrease 16 times