GX2394

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NATIONAL UNIVERSITY OF IRELAND, GALWAY

SPRING EXAMINATIONS 2001

FIRST YEAR DIPLOMA IN NURSING EXAMINATIONS

BIOLOGICAL SCIENCES (BL188)

PHYSIOLOGY AND PATHOPHYSIOLOGY (SI100)

TIME ALLOWED: 1.5 HRS

ANSWER ANY 40 OF THE FOLLOWING 50 QUESTIONS.
NO MORE THAN 3-5 LINES WILL BE EXPECTED FOR ANY ANSWER.
NO LONGER THAN 2 MINUTES SHOULD BE SPENT ON ANY ONE ANSWER.

1. List the major functions of the cell membrane.

2. What are the major substances (i.e. ions etc.) found in **intracellular** fluid?

3. List the body fluid compartments that make up **extracellular** fluid.

4. When we state that the resting membrane potential of a nerve is -70 milli volts, what does this mean?

5. What is the function of an action potential in a nerve cell?

6. Is the conduction of a nerve impulse faster in myelinated or unmyelinated nerves? What is myelin?

7. What is the function of a nerve synapse?

8. Describe what happens at the neuromuscular junction.

9. In relation to skeletal muscle what is a sarcomere?

10. List the two major contractile proteins in muscle. List two other substances involved in muscle contraction and briefly outline their role.

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11. List the two branches of the autonomic nervous system and one major function of each branch.

12. List 4 major functions of the kidney.

13. List the 3 steps in urine formation.

14. Write a short note on the control of pH in the blood.

15. After an increase in arterial blood pressure, how do the baroreceptors act to bring back the blood pressure to normal?

16. Give two important factors other than blood pressure which affect blood flow in the coronary and brain circulations (two factors for each circulation).

17. List two cell types involved in the immune system. List one specific function of each of these cell types.

18. List three functions of saliva.

19. What are the products of digestion of carbohydrates, fats and proteins? Name one enzyme involved in the digestion of each of these food groups and state where that enzyme is found.

20. How is acid secreted in the stomach? (Diagram will suffice)

21. List two types of hormones. How are these hormone groups carried in blood?

22. Name the two hormones produced by the posterior pituitary. List one function of each hormone.

23. Briefly describe the physiological manifestations of over- and under-production of growth hormone.

24. Describe the consequences of iodine deficiency on the thyroid gland.

25. What is the major action of aldosterone? Explain (using a diagram if you wish) how it exerts this action.

26. Briefly describe the pattern of release of cortisol. How is the release of cortisol controlled?

27. Outline two functions of sertoli cells in the testes.

28. Briefly describe the changes that take place in the ovary during the follicular phase of the menstrual cycle.

29. Name the steroid hormones involved in female reproduction. List two functions of one of these hormones.

30. List the cells present in the blood and one function you know for each.

31. What dietary vitamins or minerals are important for red blood cell production?

32. What is anaemia? Give examples of causes of anaemia.

33. What are the four main stages in blood clotting?

34. Draw a picture of the heart naming the chambers and the valves.

35. Draw an electrocardiogram indicating what each wave represents.

36. Define systole and diastole.

37. What is cardiac output and how can it be calculated?

38. Draw an alveolus and list its functions.

39. What is surfactant and what effect does it have in the lungs?

40. What is the function of the diaphragm? Give examples of condition(s) in which it cannot carry out its function properly.

41. What is the dead space in the lungs?

42. List any six benefits that regular physical exercise can provide for overall health.

43. Name the structures of the hindbrain and list their main functions.

44. What type of sensory information is carried by the (a) dorsal column, (b) lateral spinothalamic tract?

45. With the aid of a diagram, outline the pathway of a pain signal from nociceptor to the cerebral cortex.

46. List the main brain areas involved in movement and briefly outline their roles.

47. With the aid of a diagram, describe the basic stretch reflex.

48. Outline the role in vision of 4 different types of neurones in the retina.

49. Outline the role of the cochlea in hearing.

50. What is a cataract? What changes in vision are caused by a cataract?