2006-2008 MOCK BIOLOGY ESSAYS ON ADAPTATION

1. **Describe** how the mammalian heart **is ADAPTED** to its function (20mks)
2. Explain how predators are ADAPTED to capture their prey. 14mks
3. Describe how hydrophytes are ADAPTED to living in areas with abundant water. (8mks)
4. Describe the ADAPTATIONs of seeds and fruits to dispersal. 20mks
5. Describe how the xerophytes are ADAPTED to their habitats. 20mks
6. Describe how the mammalian skin is ADAPTED to its functions. (20mks)
7. Describe how a male reproductive system is ADAPTED to its functions. 20mks
8. Describe the ADAPTATIONs of wind pollinated flowers. (20mks)
9. Describe how herbivorous mammals are ADAPTED to their mode of feeding. (16mks)
10. **Explain the** ADAPTATIONs of respiratory surfaces to their functions. (10 marks)
11. **Explain** how a body fish is ADAPTED for movement in its habitat. (20mks)
12. **Describe** how different types of tropisms ADAPT plants for survival in their habitats. (20mks)
13. Explain how the mammalian kidney **is ADAPTED** to its functions. (17 mks)
13. Describe how insect pollinated flowers are **ADAPTED** to pollination. (14 mks)
14. How is the gaseous exchange system of a mammal **ADAPTED** to perform its functions? (20mks)
15. **Describe** the various ways in which seeds and fruits **are ADAPTED** for dispersal. (20mks)
16. **Describe** how the mammalian ear **is ADAPTED** to perform its functions. (20mks)
17. Describe how small intestines are **ADAPTED** for its functions. (20 mks)
18. **Describe** how the mammalian eye is **ADAPTED** to perform its functions. (20mks)
19. Describe how desert plants are **ADAPTED** to conserve water. (12mks)
20. Describe the **ADAPTATIONS** of the mammalian blood. (17mks)
21. Explain how the leaf is ADAPTED to photosynthesis
22. Describe the ADAPTATIONS of various types of teeth in mammals to their feeding habits
23. Describe the ADAPTATIONS of the structures of the mammalian (human)
24. (b) Describe the ADAPTATIONS of the structure of the root, root hair cell, xylem and phloem to their functions
25. Describe the ADAPTATIONS of the internal structure of the leaf to transpiration
26. Describe the ADAPTATIONS of the structure of the blood vessels to their functions
27. Describe the ADAPTATIONS of various types of respiratory structures in animals to their functions

28. Describe the ADAPTATIONS of the structures of the human lungs, and liver to their functions
29. Describe the ADAPTATIONS of seeds & fruits to method of dispersal.
30. Describe the ADAPTATIONS of the structure of the human male & female reproductive system to functions
31. Describe the ADAPTATIONS of the structure of the mammalian nervous system to its functions
32. Describe the ADAPTATIONS of the structure to function of the human ear and eye

33. **Describe** the evidence of organic evolution
(20mks)

34. a) Explain how various environmental factors increase the rate of transpiration
(16 mks)

b) What is the significance of transpiration to plants (4 mks)

35. a) Name two processes by which flowering plants excrete products, and for each process, state two waste products that are eliminated. (6 mks)

b) Explain the roles of the

(i) Liver

(ii) Kidneys in eliminating excess amino acids from the human body.(14 mks)

36. Describe the structure and function of various parts of the mammalian skin.(20 mks)

37. In Britain, it is observed that there are two varieties of a moth species *(Briston betulania*). These are the light coloured peppered moth and the melanic form (dark coloured). It is observed that the light coloured moth is at high population in the forest land while the melanic form was at high population near industries. Explain the evolution principle behind the above observation.(16 mks)

b) State and explain the principles of Lamarck's theory of evolution. (4 mks)

b) Explain how digestion of various food substances takes place in the duodenum.
(8 mks)

38. Describe the importance of a balanced diet in children. (20mks)

39. (a)(i) Lamarck's theory of evolution has been rejected by scientists today. Explain. (2 mks)

(ii) Explain the meaning of the term "Survival of the fittest." (3 mks)

b) Describe the various evidences which show that organic evolution has taken place. (15 mks)

40. (a) **What** is the role of the Gibberellins in plant growth and development.
(5mks) (b) **List down** the characteristics features of the meristematic cells in a plant. (5mks)

(c) **Explain** the effects of unidirectional light on growth, in a seedling.
(10mks)

41. **Describe** how excretion takes place in the mammalian kidneys? (20 marks)

42. **Describe** the digestion of egg albumen from the time of ingestion to the time it is assimilated in the body cells.
(20mks)

43. **Describe** the evidences that support the theory of organic evolution. (20mks)

44. a) Differentiate between Homologous and Analogous structures. (4 mks)

b) Describe how natural selection brings about ADAPTATION of a species to its environment (18 mks)

45. Describe the role of hormones in the human menstrual cycle (20 mks)

b) Explain how a seed is formed in a flowering plant. (6 mks)

46. Describe the various evidences which show that organic evolution has taken place. (20 mks)

47. a) What is meant by natural selection (3 Marks)

48. a) Describe secondary thickening in flowering plants (14 Marks)

b) Describe one method which can be used to measure the average growth rate of a single leaf on a plant (6 Marks)

49. Describe the process of digestion that takes place when one eats an egg white and ugali.(20 mks)

50. Describe the various evidences which show that evolution has taken place. (20 mks)

51. (a) **Name Five** methods of excretion in plants. (5mks)

(b)**Give Three** reasons why plants lack complex excretory system (3mks)

(b) **State six** excretory products in plants and give their economic uses. (12mks)

52. (a) **What** is pollution? (2marks)

53. (b) **Describe** the effects of the various pollutants in water and soil to living organisms.(18marks)

54. Explain the sources of water pollution and their effects on aquatic ecosystem. (20 mks)

55. Describe the process of blood clotting in man when blood is exposed to air.(5mks)

56. **Describe** the skin under the following headlines. (20mks)
    a. As a thermoregulatory organ
    b. As an excretory organ
    c. As a sense organ
    d. As a protective organ
    e. As an osmoregulatory organ.

57. **Explain** the mechanism by which a human body maintains a constant body temperature. (20mks)

58. (a) **What** is pollination? (2mks)

(b) **Describe** the sequence of events that take place from the time a pollen grain falls on the stigma until a seed is formed.
(18mks)

59. **Describe** locomotion in a finned fish. (20mks)

60. (a) **Distinguish** between breathing and respiration. (2 marks)

(b) **Describe** breathing mechanism in man. (14 marks)

61. (a) **Describe** the Darwin theory of natural selection. (10 marks)

(b) **Explain** why plant breeders encourage cross-breeding and discourage inbreeding. (4 marks)

(c) The ban of Sulphur based malaria drugs is because the plasmodium has developed resistance after long exposure to the drugs. **Explain** how resistance to the drug develops. (4 marks)

62. Explain how the various activities of man have caused pollution of air. (20mks)

63. Describe secondary thickening in flowering plants. (13mks)

64. Describe one method which can be used to measure the average growth of a root seedling.

65. a) Name the parts of the body, where mammalian blood cells are manufactured. (3mks)

66. Compare the nervous and endocrine systems. (8mks)

(b) A barefooted man suddenly steps on a sharp thorn and quickly jumps up. Describe the changes that occur in the man's body that brings about this response. (12mks)

67. Describe the composition and functions of mammalian blood. (20mks)

68. With the aid of a diagram, explain double fertilization in flowering plants (15 mks)

69. b) State the changes that occur in the flowering plant after fertilization (5mks)

70. (a) What is homeostasis?
2mks
b) Describe the homeostatic functions of the mammalian liver.
18mks

71. Describe the role of hormones in the menstrual cycle in humans. 20mks

72. a) Describe how you would use the capture recapture method to estimate the population of grasshoppers in school farm. (9mks)
b) Describe the physical factors that are likely to influence the population of grasshoppers in the school farm.
(11mks)

73. Describe the role of plant hormones in their growth and development and application in agriculture.

74. a) State the differences between gaseous exchange in fish and mammals. 4mks
b) Describe how inspiration and expiration take place in man. 16mks

75. Describe the role of hormones in the human menstrual cycle. 20mks
a) Explain how blood is involved in transport. Stating the constituents of blood involved. 14mks

b) Describe how blood protects the body. 4mks

76. Identify two sites in the mammalian body where blood is manufactured. 2mks

77. (a) Citing specific examples. State and explain characteristics of gaseous exchange structures or respiratory surfaces in mammals. (8 Marks)

(b) Describe the process of exhalation in man. (11 Marks)

(c) Which part of the brain controls breathing? (1 Mark)

78. Describe various economic importance of

(i) Bacteria (10 Marks)

(II) Fungi (10 Marks)

80. A student ate lean meat for breakfast. Explain fully how the meat eventually becomes part of the body tissue. 20mks

81. a) Describe the process of fertilization in a flowering plant. 14mks

b) How does the process above differ from that in Bryophytes. 6mks

Describe how the mammalian heart **is ADAPTED** to its function (20mks)

ADAPTATION = Modified structure + function

Describe the mammalian heart structure & its function (20mks)

Structure	modification	Function
Left ventricle	Thick muscular wall	Because it has to pump blood at a longer distance, therefore develops higher pressure.
heart	Four chambered	To able bring about double circulation
Auricles	Thin walled	To receive blood from the lungs & the body then pump blood to the ventricles
Septum	Muscular partition	Separating oxygenated blood from deoxygenate blood
Cuspid Valves	Cup shaped & located between the auricles & ventricles	Prevent back flow of blood to the auricle during ventricular systole
Semilunar valves	Pocket shaped & Located in aorta & pulmonary artery	Prevent back flow of blood to the ventricles during ventricular diastole
Tendons	Attached to the cuspid valves & ventricles	To prevent the cuspid valves from turning inside out during ventricular systole
Coronary artery	Highly branching from the aorta	To supply oxygenated blood to entire cardiac muscle
SAN	myogenic	Generating an impulse to keep the cardiac contractions going
AVN	myogenic	To boost impulse from the auricle to the bundle of His
Purkinje fibre & bundle of His	Fast transmitters of impulse	To spread the impulse to the entire ventricular wall
Vagus nerve		
Sympathetic nerve		
Cardiac muscle		
Pericardium membrane		
Aorta & Pulmonary artery		
Vena cava & pulmonary vein		