

Science Bowl Questions – Biology, Set 2

1. Multiple Choice: The adult human of average age and size has approximately how many quarts of blood? Is it:

- a) 4
- b) 6
- c) 8
- d) 10

ANSWER: B -- 6

2. Multiple Choice: Once the erythrocytes enter the blood in humans, it is estimated that they have an average lifetime of how many days. Is it:

- a) 10 days
- b) 120 days
- c) 200 days
- d) 360 days

ANSWER: B -- 120 Days

3. Multiple Choice: Of the following, which mechanisms are important in the death of erythrocytes (pron: eh-rith-reh-sites) in human blood? Is it

- a) phagocytosis (pron: fag-eh-seh-toe-sis)
- b) hemolysis
- c) mechanical damage
- d) all of the above

ANSWER: D -- all of the above

4. Multiple Choice: Surplus red blood cells, needed to meet an emergency, are MAINLY stored in what organ of the human body? Is it the:

- a) pancreas
- b) spleen
- c) liver
- d) kidneys

ANSWER: B – spleen

5. Multiple Choice: When a human donor gives a pint of blood, it usually requires how many weeks for the body RESERVE of red corpuscles to be replaced? Is it:

- a) 1 week
- b) 3 weeks
- c) 7 weeks
- d) 21 weeks

ANSWER: C -- 7 weeks

6. Short Answer: There are three substances found in human blood which carry oxygen and which begin with the letter "H". Name two of these substances.

ANSWER: Hemoglobin, Hemocyanin, Hemerythrin

7. Multiple Choice: The several types of white blood cells are sometime collectively referred to as:

- a) erythrocytes (pron: eh-rith-row-cites)
- b) leukocytes (pron: lew-kah-cites)
- c) erythroblasts (pron: eh-rith-rah-blast)
- d) thrombocytes (pron: throm-bow-cites)

ANSWER: B -- leukocytes

8. Multiple Choice: The condition in which there is a DECREASE in the number of white blood cells in humans is known as:

- a) leukocytosis (pron: lew-kO-sigh-toe-sis)
- b) leukopenia (pron: lew-kO-pea-nee-ah)
- c) leukemia (pron: lew-kee-me-ah)
- d) leukohyperia (pron: lew-kO-high-per-e-ah)

ANSWER: B -- leukopenia

9. Multiple Choice: The smallest of the FORMED elements of the blood are the:

- a) white cells
- b) red cells
- c) platelets
- d) erythrocytes

ANSWER: C – platelets

10. Multiple Choice: Which of the following statements concerning platelets is INCORRECT. Platelets:

- a) contain DNA
- b) are roughly disk-shaped
- c) have little ability to synthesize proteins
- d) are between 1/2 and 1/3 the diameter of the red cell

ANSWER: A -- contain DNA

11. Short Answer: What is the primary function of the platelets in huma blood?

ANSWER: clotting or blocking leaks from blood vessels

12. Multiple Choice: When a wound occurs in humans, the platelets in the blood activate a substance which starts the clotting process. The substance which starts the clotting is:

- a) adenosine (pron: ah-den-ah-seen)
- b) histamine
- c) lecithin (pron: less-ah-thin)
- d) thrombin

ANSWER: D -- Thrombin

13. Multiple Choice: When looking at the cross section of the human tibia, one finds the RED marrow in the:

- a) medullary cavity
- b) cancellous bone
- c) periosteum
- d) epiphysis

ANSWER: A -- medullary cavity

14. Multiple Choice: Lengthening of long bones in humans occurs in a particular area of the bone. This area is called the:

- a) medullary canal
- b) cancellous bone
- c) periosteum (pron: per-E-ahs-tee-em)
- d) epiphysis (pron: eh-pif-eh-sis)

ANSWER: D – Epiphysis

15. Multiple Choice: The part of the human brain which is an important relay station for the sensory impulses and also is the origin of many of the involuntary acts of the eye such as the narrowing of the pupil in bright light is the:

- a) hypothalamus
- b) midbrain
- c) corpus callosum
- d) cerebellum

ANSWER: B -- Midbrain

16. Multiple Choice: In the human brain, body temperature, metabolism, heart rate, sexual development, sleep and the body's use of fat and water are influenced by this region of the brain. This region of the brain is the:

- a) hypothalamus
- b) midbrain
- c) corpus callosum
- d) cerebellum

ANSWER: A -- hypothalamus

17. Multiple Choice: In which cerebral lobes is the speech center located? Is it the:

- a) frontal
- b) parietal
- c) temporal
- d) occipital

ANSWER: A -- frontal

18. Multiple Choice: In most axons, the myelin sheath is interrupted at intervals of about 1 millimeter or more. These interruptions are called the:

- a) glial
- b) nodes of Ranvier (pron: ron-vee-ay)
- c) collaterals
- d) nodes of Babinet

ANSWER: B -- Nodes of Ranvier

19. Short Answer: Mosses and liverworts comprise this subdivision of plants. Name this plant subdivision.

ANSWER: Bryophytes (pron: bry-eh-fites) or Bryophyta

20. Short Answer: This disease, caused by infection with the gram-negative *Yersinia pestis*, is transmitted by fleas from rats to humans. What is the more common name for this disease?

ANSWER: Bubonic Plague or Black Death

21. Short Answer: In the mammalian body, this element plays many important roles. Try to identify this element with the fewest number of clues. This element is required to insure the integrity and permeability of cell membranes, to regulate nerve and muscle excitability, to help maintain normal muscular contraction, and to assure cardiac rhythmicity. It also plays an essential role in several of the enzymatic steps involved in blood coagulation and is the most important element of bone salt. Name this element.

ANSWER: Calcium

22. Multiple Choice: What eight-letter name starting with the letter "O" is given to that branch of medical science concerned with the study of tumors?

ANSWER: Oncology

23. Short Answer: In the more highly developed animals, such as humans this gas is used to regulate the activity of the heart, the blood vessels, and the respiratory system. WORKING MUSCLES PRODUCE A LARGE AMOUNT OF THIS SUBSTANCE. Narcosis due to this gas is characterized by mental disturbances which can include confusion, headache, low blood pressure and hypothermia. Name this gas.

ANSWER: Carbon Dioxide or CO₂

24. Multiple Choice: Cariology is the study of the:

- a) human heart
- b) tooth decay
- c) kidneys
- d) liver

ANSWER: B -- Tooth Decay

25. Short Answer: The larval form of butterflies and moths is more commonly known as what?

ANSWER: caterpillar

26. Short Answer: Name the sac-like, blind pouch of the large intestine, situated below the level of the junction of the small intestine into the side of the large intestine. At the lower portion of this pouch one finds the appendix.

ANSWER: Cecum or Caecum

27. Multiple Choice: During the final stage of cell division, the mitotic apparatus disappears, the chromosomes become attenuated, the centrioles duplicate and split, the nuclear membrane becomes reconstituted and the nucleolus reappears. This phase of cell division is known as:

- a) prophase (pron: prO-phase)
- b) metaphase
- c) anaphase
- d) telophase

ANSWER: D -- Telophase

28. Multiple Choice: In cell division, the phase following the metaphase is known as:

- a) prophase
- b) anaphase
- c) telophase
- d) extophase

ANSWER: B -- Anaphase

29. Short Answer: All cells of an organism find their lineage from a single fertilized cell. This single fertilized cell is called what?

ANSWER: Zygote

30. Multiple Choice: Name the clear watery liquid that surrounds the brain and spinal cord and fills the four cavities or ventricles of the brain.

ANSWER: Cerebrospinal Fluid

31. Multiple Choice: The order of insects which includes beetles is known as:

- a) Coleoptera (pron: kO-lee-op-teh-rah)
- b) Orthoptera (pron: or-tho-op-teh-rah)
- c) Hymenoptera (pron: high-meh-nop-teh-rah)
- d) Diptera (pron: dip-teh-rah)

ANSWER: A -- Coleoptera

32. Multiple Choice: This major protein component of connective tissue in mammals comprises most of the organic matter of skin, tendons, bones, and teeth, and occurs as fibrous inclusions in most other body structures. Is this material:

- a) elastin
- b) collagen
- c) fatty acids
- d) keratin

ANSWER: B -- collagen

33. Multiple Choice: Sick cell anemia and Huntington's chorea are both:

- a) virus-related diseases
- b) bacteria-related diseases
- c) congenital disorders
- d) none of the above

ANSWER: C -- Congenital Disorders

34. Multiple Choice: In most species of Paramecium there are how many contractile vacuoles? Is it:

- a) one
- b) two
- c) three
- d) four

ANSWER: B – Two

35. Multiple Choice: The major fibrous proteins are:

- a) peptone and edestin
- b) glutelin and leucine

- c) valine and lysine
- d) myosin and actin

ANSWER: D -- Myosin and Actin

36. Short Answer: Name the outer portion of a stem or root, bounded externally by the epidermis, and internally by the cells of the pericycle.

ANSWER: Cortex

37. Multiple Choice: Costal cartilage:

- a) attach the ribs to the sternum
- b) cover the ends of the femur
- c) is found in the pinna of the ear
- d) forms the intervertebral disks of the backbone

ANSWER: A -- Attach the ribs to the sternum

38. Multiple Choice: From which grandparent or grandparents did you inherit your mitochondria (pron: my-toe-chon-dria)? Is it your:

- a) mother's parents
- b) paternal grandfather
- c) grand mothers
- d) maternal grandmother

ANSWER: D -- maternal grandmother

39. Multiple Choice: Which of the following are NOT part of a neuron?

- a) synapse
- b) axon
- c) Nissl bodies
- d) dendrite

ANSWER: A – SYNAPSE

40. Multiple Choice: The resting potential of a neuron is dependent on what two ions?

- a) lead and calcium ions
- b) calcium and phosphate ions
- c) sodium and potassium ions
- d) potassium and phosphate ions

ANSWER: C -- sodium and potassium ions

41. Multiple Choice: Which of the following is NOT a type of neuron?

- a) sensory
- b) motor
- c) association
- d) stimulatory

ANSWER: D -- STIMULATORY

42. Multiple Choice: Melatonin (pron: mel-eh-toe-nin) is produced by the:

- a) skin

- b) pineal gland
- c) liver
- d) pituitary gland

ANSWER: B -- PINEAL GLAND

43. Multiple Choice: Which of the following statements is TRUE of insulin? Is it:

- a) secreted by the pancreas
- b) a protein
- c) involved in the metabolism of glucose
- d) all of the above

ANSWER: D -- ALL OF THE ABOVE

44. Multiple Choice: Select the hormone INCORRECTLY paired with its target.

- a) TSH - thyroid gland
- b) ACTH - anterior pituitary
- c) LH - ovary or testis
- d) MSH - melanocytes (pron: meh-lan-o-cite)

ANSWER: D -- MSH – MELANOCYTES

45. Multiple Choice: Which of the following tissues secrete hormones?

- a) pancreas
- b) ovaries
- c) gastro-intestinal tract
- d) all of the above

ANSWER: D -- ALL OF THE ABOVE

46. Multiple Choice: Which of the following structures is directly attached to the ovary?

- a) oviduct
- b) uterus
- c) suspensory ligaments
- d) vagina

ANSWER: C -- SUSPENSORY LIGAMENTS

47. Multiple Choice: Fertilization of the ovum by the sperm usually occurs in the:

- a) oviduct
- b) vagina
- c) uterus
- d) ovary

ANSWER: A -- OVIDUCT

48. Multiple Choice: The corpus luteum secretes:

- a) HCG
- b) LH
- c) FSH
- d) progesterone

ANSWER: D -- PROGESTERONE

49. Multiple Choice: Which of the following does sperm NOT travel through?

- a) ureter
- b) urethra
- c) vas deferens
- d) epididymus

ANSWER: A – URETER

50. Multiple Choice: The placenta in humans is derived from the:

- a) embryo only
- b) uterus only
- c) endometrium and embryo
- d) none of the above

ANSWER: C -- ENDOMETRIUM AND EMBRYO

51. Multiple Choice: The number of mature gametes resulting from meiosis in the female is:

- a) 1
- b) 2
- c) 3
- d) 4

ANSWER: A -- 1

52. Multiple Choice: Synapsis and crossing over of chromosomes occurs in which phases of meiosis?

- a) Interphase
- b) Prophase
- c) Metaphase
- d) Teleophase

ANSWER: B -- PROPHASE

53. Multiple Choice: A layer of dead skin cells is found in the:

- a) subcutaneous tissue
- b) dermis
- c) epidermis
- d) no dead cells are in the skin

ANSWER: C -- EPIDERMIS

54. Multiple Choice: Glial (pron: glee-el) cells are found in the:

- a) muscular system
- b) digestive system
- c) endocrine system (pron: en-de-kren)

d) nervous system

ANSWER: D -- NERVOUS SYSTEM

55. Multiple Choice: Myelin sheaths are found:

- a) surrounding tendons
- b) covering the brain
- c) covering muscles
- d) around axons of neurons

ANSWER: D -- AROUND AXONS OF NEURONS

56. Multiple Choice: Which of the following is an INCORRECT statement about the parasympathetic system?

- a) It increases digestive action.
- b) It is the fight or flight system.
- c) slows breathing rate
- d) establishes resting state

ANSWER: B -- IT IS THE FIGHT OR FLIGHT SYSTEM.

57. Multiple Choice: Which of the following is NOT a component of the human axial skeleton?

- a) sternum
- b) vertebral column
- c) tarsals
- d) skull

ANSWER: C -- TARSALS

58. Multiple Choice: Phalanges are found in the:

- a) feet
- b) skull
- c) hip
- d) chest

ANSWER: A – FEET

59. Multiple Choice: The phase of contraction of a muscle occurs when:

- a) tropomyosin binds and releases actin
- b) myosin binds and releases actin
- c) actin binds and releases myosin
- d) none of the above

ANSWER: B -- MYOSIN BINDS AND RELEASES ACTIN

60. Multiple Choice: Select the INCORRECT statement concerning the muscular system.

- a) Bones contact other bones at joints.
- b) Flexors decrease the angle of a joint.
- c) Adductors move a limb away from the midline.
- d) Tendons attach muscle to bone.

ANSWER: C -- ADDUCTORS MOVE A LIMB AWAY FROM THE MIDLINE.

61. Multiple Choice: Which type of muscle is a syncytium (pron: sin-sish-E-um)?

- a) skeletal
- b) cardiac
- c) smooth
- d) all of the above

ANSWER: A -- SKELETAL

62. Multiple Choice: When the potential difference across a membrane of a neuron equals the threshold, what results?

- a) movement of the membrane
- b) action potential
- c) relaxation
- d) contraction

ANSWER: B -- ACTION POTENTIAL

63. Multiple Choice: What ions determine the resting potential of a nerve?

- a) sodium and calcium
- b) calcium and copper
- c) potassium and calcium
- d) sodium and potassium

ANSWER: D -- SODIUM AND POTASSIUM

64. Multiple Choice: Which structure does NOT play a part in the motion of cells?

- a) microvilli
- b) cilia
- c) flagella
- d) pseudopodia

ANSWER: A -- MICROVILLI

65. Multiple Choice: Bacteriophage (pron: back-teer-e-o-faj) are:

- a) bacteria
- b) bacteria precursors
- c) viruses
- d) agents which cause the production of bacteria

ANSWER: C -- VIRUSES

66. Multiple Choice: Which of the following is NOT a mode of genetic exchange within a bacterial population?

- a) conjugation
- b) transduction
- c) transformation
- d) translation

ANSWER: D -- TRANSLATION

67. Multiple Choice: The blastula develops into the:

- a) gastrula

- b) morula
- c) endoderm
- d) zygote

ANSWER: A -- GASTRULA

68. Multiple Choice: Tissue differentiation begins at which stage?

- a) zygote
- b) morula
- c) blastula
- d) gastrula

ANSWER: D – GASTRULA

69. Multiple Choice: The nervous system develops from which germ layer?

- a) ectoderm
- b) mesoderm
- c) endoderm
- d) none of the above

ANSWER: A -- ECTODERM

70. Multiple Choice: During inspiration, the diaphragm moves:

- a) down by contraction
- b) down by relaxation
- c) up by contraction
- d) up by relaxation

ANSWER: A -- DOWN BY CONTRACTION

71. Multiple Choice: The valve between the right ventricle and the pulmonary artery is the:

- a) mitral valve
- b) semilunar valve
- c) bicuspid valve
- d) tricuspid valve

ANSWER: A -- SEMILUNAR VALVE

72. Multiple Choice: Which of the following is NOT a function of the kidney?

- a) excretion of urea
- b) regulation of fluids and electrolytes
- c) elimination of toxic substances
- d) defecation

ANSWER: D -- DEFECATION

73. Multiple Choice: When CO₂ (carbon dioxide) is dissolved in water, it yields a solution that:

- a) has acidic properties
- b) has basic properties
- c) is neutral

ANSWER: A -- HAS ACIDIC PROPERTIES

74. Multiple Choice: Digestion of carbohydrates begins where?

- a) small intestines
- b) colon
- c) mouth
- d) stomach

ANSWER: C -- MOUTH

75. Multiple Choice: Digestion of PROTEINS begins in which of the following human organs?

- a) small intestines
- b) colon
- c) mouth
- d) stomach

ANSWER: D -- STOMACH

76. Multiple Choice: Bile has what function in digestion?

- a) emulsify lipids
- b) digest proteins
- c) gluconeogenesis (pron: glue-ko-nee-o-gen-e-sis)
- d) digest carbohydrates

ANSWER: A -- EMULSIFY LIPIDS

77. Multiple Choice: Of the following, which is a basic need of all living things?

- a) oxygen gas
- b) light
- c) hydrogen gas
- d) water

ANSWER: D -- WATER

78. Multiple Choice: A botanist is most likely to study:

- a) Monerans
- b) Protistans (pron: pro-tis-tans)
- c) Fungi
- d) Virions

ANSWER: C -- FUNGI

79. Multiple Choice: A virus must do what to reproduce?

- a) form a latent virus
- b) undergo transformation
- c) infect a cell
- d) conjugate

ANSWER: C -- INFECT A CELL

80. Multiple Choice: The chromosomes of a eukaryotic cell are located i the:

- a) mitochondria (pron: my-toe-kon-dria)
- b) nucleus
- c) ribosome

d) endoplasma

ANSWER: B -- NUCLEUS

81. Multiple Choice: Which of the following is an example of symbiosis?

- a) lichen
- b) slime mold
- c) amoeba
- d) moss

ANSWER: A -- LICHEN

82. Multiple Choice: Oxygen enters the body of a grasshopper through:

- a) gills
- b) spinnerets
- c) spiracles
- d) book lungs

ANSWER: C -- SPIRACLES

83. Multiple Choice: A heart with a single atrium and single ventricle is a characteristic of adult:

- a) amphibians
- b) arthropods
- c) birds
- d) fish

ANSWER: D -- FISH

84. Short Answer: Name the four main excretory organs identified in man.

ANSWER: SKIN, KIDNEYS, LUNGS, INTESTINAL TRACT

85. Multiple Choice: The physical appearance and properties of an organism which is the expression of the genetic makeup is called the:

- a) phenotype
- b) pangensis
- c) parental trait
- d) genotype

ANSWER: A -- PHENOTYPE

86. Short Answer: How many nucleotides make up a codon (pron: kO-don)?

ANSWER: 3

87. Multiple Choice: The complex of sugar polymers and proteins which are patchily distributed on the plasma membranes of animal cells is called

- a) cellulose
- b) chitin
- c) glycocalyx
- d) cytoskeleton

ANSWER: C -- GLYOCALYX

88. Short Answer: During cellular respiration, glucose is oxidized completely to what two compounds?

ANSWER: CO₂ (CARBON DIOXIDE) AND H₂O (WATER)

89. Multiple Choice: Organisms with cells containing two sets of parental chromosomes are called:

- a) diploid
- b) bisomal
- c) haploid
- d) autosomal

ANSWER: A – DIPLOID

90. Multiple Choice: The type of gene interaction in which the effects of one gene override or mask the effects of other entirely different genes is called:

- a) linkage
- b) mutation
- c) pleiotropy (pron: ply-ah-tropy)
- d) epistasis (pron: eh-pis-te-sis)

ANSWER: D – EPISTASIS

91. Multiple Choice: For which of the following creatures is fat the greatest percentage of body weight?

- a) termite
- b) blue whale
- c) zebra
- d) female lion

ANSWER: B -- BLUE WHALE

92. Multiple Choice: Which is false regarding freshwater fish?

- a) their blood is hypertonic to their environment
- b) they often actively take up salt
- c) they excrete urine hypotonic to the blood
- d) their gills actively excrete salts

ANSWER: D -- THEIR GILLS ACTIVELY EXCRETE SALTS

93. Multiple Choice: Neutral fats, oils and waxes may be classified as:

- a) lipids
- b) carbohydrates
- c) proteins
- d) none of the above

ANSWER: A -- LIPIDS

94. Short Answer: Name three basic morphologies of bacteria.

ANSWER: (1) COCCI (COCCUS), (2) BACILLI (BACILLUS) or ROD, (3) SPIROCHETES or SPIRILLA or SPIRAL

95. Short Answer: What is the name of the 6 carbon monosaccharide that is the universal cellular fuel of plants and animals?

ANSWER: GLUCOSE (DEXTROSE)

96. Multiple Choice: During which phase of the cell cycle are normal components of the cell synthesized and assembled?

- a) the M phase
- b) the G1 phase
- c) the S phase
- d) the G2 phase

ANSWER: B -- THE G1 PHASE

97. Multiple Choice: Which of the following is NOT a characteristic shared by most of the members of the kingdom plantae?

- a) they are multicellular
- b) they are nonmotile
- c) they possess bilateral symmetry
- d) there is an alternation of haploid and diploid generations

ANSWER: C -- THEY POSSESS BILATERAL SYMMETRY

98. Short Answer: If an individual has two dissimilar alleles for a trait, with regard to that trait he is said to be:

ANSWER: HETEROZYGOUS

99. Short Answer: How many chromosomes per cell does a Down's Syndrome (trisomy 21) victim have?

ANSWER: 47

100. Short Answer: If a male who is heterozygous for an autosomal trait mates with a female who is also heterozygous for that trait, what percent of their offspring are likely to be heterozygous for this trait as well?

ANSWER: 50%