BIOLOGY PRACTICE TEST

In the following 20 questions there is always only <u>one</u> correct answer.

(correct answer = 2 points, false answer = 0 points)

1) **Certain nutrients are considered "essential" in the diet of human because**
   a) human is not able to synthesize these nutrients
   b) only human uses those nutrients
   c) the nutrients are subunits of important polymers
   d) the nutrients are necessary coenzymes
   e) only certain foods contain them

2) **Heartbeat is initiated by electrical excitation in**
   a) Atrio-ventricular node (AVN)
   b) Sino-atrial node (SAN)
   c) Purkynje cells
   d) Muscle cells of the left ventricle wall
   e) Bundle of His

3) **What aspects of protein structure are stabilized or assisted by hydrogen bonds?**
   a) primary structure only
   b) secondary structure only
   c) tertiary structure only
   d) quaternary structure only
   e) secondary, tertiary, and quaternary structures, but not primary structure

4) **Which of given process are regulated by erythropoietin?**
   a) Humoral immunity
   b) Red blood cell production
   c) Bone ossification
   d) Blood clotting
   e) Release of neurotransmitters

5) **Which of the following is a true statement about sexual vs. asexual reproduction?**
   a) asexual reproduction, but not sexual reproduction, is characteristic of plants and fungi
   b) in sexual reproduction, individuals transmit 50 % of their genes to each of their offspring
   c) in asexual reproduction, offspring are produced by fertilization without meiosis
   d) asexual reproduction produces only haploid offspring
   e) sexual reproduction is seen only in organisms which have sex chromosomes

6) **What do we mean when we use the terms "monohybrid cross" and "dihybrid cross"?**
   a) a monohybrid cross involves a single parent, whereas a dihybrid cross involves two parents
   b) a monohybrid cross produces a single progeny, whereas a dihybrid cross produces two progeny
   c) a dihybrid cross involves organisms that are heterozygous for two characters and a monohybrid cross involves organisms that are heterozygous for one character only
   d) a monohybrid cross is performed for one generation, whereas a dihybrid cross is performed for two generations
   e) a monohybrid cross results in a 9:3:3:1 ratio whereas a dihybrid cross gives a 3:1 ratio

7) **When crossing an organism that is homozygous recessive for a single trait with a heterozygote, what is the chance of producing an offspring with the homozygous recessive phenotype?**
   a) 0 %
   b) 25 %
   c) 50 %
   d) 75 %
   e) 100 %

8) **In a Hardy-Weinberg population with two alleles, A and a, that are in equilibrium, the frequency of allele a is 0.2. What is the percentage of the population that is heterozygous for this allele?**
   a) 0.2 %
   b) 2.0 %
   c) 4.0 %
   d) 16.0 %
   e) 32.0 %

9) **The absorptive epithelia in the gut are considered "polarized" because**
   a) thick and thin filaments are present
   b) they pump waste into the lumen while pumping nutrients toward the blood
   c) the pigment seen on the top and bottom of the cells is different
   d) they must fire action potentials to absorb most nutrients
   e) the structures on the apical surface are different than those on the basal surface

10) **In the digestive system, peristalsis is defined as**
   a) a process of fat emulsification in the small intestine
   b) smooth muscle contractions that move food along the oesophagus
   c) voluntary control of the rectal sphincters regulating defecation
   d) transport of nutrients to the liver through the hepatic portal vessel
   e) a common cause of loss of appetite, fatigue, and dehydration

11) Which of the following develops the greatest pressure on the blood in the mammalian aorta?

a) systole of the left ventricle
b) systole of the left atrium
c) diastole of the right ventricle
d) diastole of the right atrium
e) diastole of the left atrium

12) The filtrate in the renal pelvis enters directly from

a) the loop of Henle
b) the collecting duct
c) Bowman's capsule
d) the proximal tubule
e) the glomerulus

13) The reason that the steroid hormone aldosterone affects only a small number of cells in the body is that

a) nontarget cells destroy aldosterone before it can produce any effect
b) nontarget cells convert aldosterone to a hormone to which they do respond
c) only its target cells get exposed to aldosterone
d) only its target cells contain aldosterone receptors
e) it is unable to enter nontarget cells

14) In what aspects are mature human sperm and ovum similar to each other?

a) they both have the same number of chromosomes
b) they are approximately of the same size
c) they each have a flagellum that provides motility
d) they are produced from puberty until death
e) they are formed before birth

15) Which of the following correctly displays the sequence of developmental stages?

a) cleavage → blastula → gastrula → morula
b) cleavage → morula → blastula → gastrula
c) cleavage → gastrula → morula → blastula
d) gastrula → morula → blastula → cleavage
e) morula → cleavage → gastrula → blastula

16) The point of connection between two communicating neurons is called

a) the axon hillock
b) the dendrite
c) the synapse
d) the cell body
e) the glia

17) Semi-circular canals contain cells that are

a) chemoreceptors used in selecting migration routes
b) mechanoreceptors which function in orientation to gravity
c) photoreceptors used in setting biological rhythms
d) thermoreceptors used in prey detection
e) chemoreceptors used in acid-base balance

18) Which aneuploidy is associated with additional chromosome 16?

a) Turner's syndrome
b) Edward's syndrome
c) All human cells have trisomy of chromosome 16
d) Trisomy of chromosome 16 is not viable
e) Down syndrome

19) Injury localized to the hypothalamus would most likely disrupt:

a) short term memory
b) long term memory
c) co-ordination during locomotion
d) decision making ability
e) regulation of body temperature

20) What <u>does not belong</u> to axial skeleton?

a) lower jaw
b) ribs
c) pelvic girdle
d) vertebral column
e) all given bones belong to axial skeleton

In the following 5 questions, there are 2 correct answers out of 6.
(Two correct answers = 2 points, one correct answer = 1 point, both wrong = 0 points)

21) DNA molecules other than chromosomal DNA:

a) are not found in bacteria
b) can be found in bacteria only
c) can be found in bacteria and eukaryotes
d) can be found in certain eukaryotic organelles
e) can be found in eukaryotes only
f) are usually linear DNA molecules

22) Intracellular compartments are not found in the cells of:

a) bacteria
b) algae
c) Archaea
d) higher plants
e) invertebrates
f) yeast

23) Diabetes mellitus (DM):

a) DM type I is known as “early onset diabetes”
b) DM type II is known as “early onset diabetes”
c) insulin supplementation (in the form of insulin injections) is not necessary for patients with DM type I
d) DM type I is an autoimmune disease
e) DM type I is caused by decreased response to insulin in target tissues
f) DM type I is much more common than DM type II

24) Skeletal muscles:

a) slow-twitch fibres sustain longer contractions than fast-twitch fibres
b) fast-twitch fibres sustain longer contractions than slow-twitch fibres
c) both fast-twitch and slow-twitch fibres sustain longer contractions
d) sarcoplasmic reticulum contain sodium ions
e) the contractions of skeletal muscle also produce heat
f) have very similar cells as smooth muscles

25) Which of the following are mainly phagocytic cells?

a) B lymphocytes
b) T lymphocytes
c) eosinophils
d) basophils
e) neutrophils
f) monocytes

Correct answers (questions 1-20)

1.a, 2.b, 3.e, 4.b, 5.b, 6.c, 7.c, 8.e, 9.e, 10.b, 11.a,12.b, 13.d, 14.a, 15.b, 16.c, 17.b, 18.d, 19.e, 20.c

Correct answers (questions 21-25)

21.c,d; 22.a,c; 23.a,d; 24.a,e; 25e,f