

## Version A

There are 50 questions worth 2 points each. Choose the ONE BEST ANSWER. Use a #2 pencil to put all your answers on the scantron sheet. When finished, use a PEN to mark each pencil mark with a single slash (/).

- Which has both intra and extracellular digestion?
  - Humans.
  - Paramecium.
  - Hydra.
  - Frogs.
- Which organ secretes both digestive enzymes and insulin?
  - liver.
  - gall bladder.
  - pancreas.
  - small intestine.
- Which nitrogenous waste product requires the *most* water to excrete?
  - feces
  - uric acid.
  - urea
  - ammonia.
- Freshwater fish rid themselves of nitrogenous wastes by means of their
  - gills
  - kidneys
  - Malpighian tubules.
  - tracheal system.
- Where in the human kidney is there a molecular pump that uses energy to move *sodium ions* across a membrane?
  - Bowman's capsule.
  - Collecting duct.
  - Glomerulus.
  - Loop of Henle.
- In the kidney nephron, any water left behind in the collecting duct ends up in the
  - the bladder.
  - the colon.
  - the atrium.
  - the seminal vesicles.
- Alcohol increases urine volume because of its effect on
  - the pituitary's secretion of ADH.
  - the Bowman's capsule.
  - the renal pelvis.
  - the proximal convoluted tubule.
- Which one is **NOT** a function of the liver?
  - Converting ammonia to urea.
  - Absorbing water from urine.
  - Dumping urea into the blood.
  - Filtering ammonia out of the blood.
- What do gills and lungs have in common? Both...
  - have a large surface area.
  - use countercurrent flow.
  - make contact with the air.
  - are derived from ectoderm.
- The main reason humans drown in water is because water-filled lungs are unable to maintain
  - a concentration gradient for oxygen.
  - adequate surface area for gas exchange.
  - blood flow through the lungs.
  - their highly branched surfaces.
- In which animal does oxygen diffuse through spiracles and tracheols?
  - earthworm.
  - cockroach.
  - frog.
  - snail.
- Which of the following is **NOT** required for gas exchange in a 2-millimeter thick flatworm?
  - an internal transport system..
  - a moist gas exchange surface.
  - a concentration gradient for diffusion.
  - adequate surface area to volume ratio.

13. The amount of oxygen that can be carried by blood is significantly increased by
- respiratory pigments.
  - low blood pressure.
  - white blood cells.
  - warm body temperatures.
14. Which one is transported in significant amounts by closed circulatory systems but **not** by open circulatory systems?
- Digested food.
  - Hormones.
  - Oxygen.
  - Nitrogenous wastes
15. Blood leaving a frog's ventricle goes directly to
- the lungs
  - the gills
  - the body
  - both lungs and body
16. Which part of the heart has the **fastest** rate of spontaneous contraction ?
- The atrioventricular node.
  - The semilunar valve.
  - The sinoatrial node node.
  - The pulmonary vein.
17. In a 4-chambered heart, what prevents the backflow of blood when the ventricles **contract**?
- semilunar valves.
  - AV valves.
  - AV nodes.
  - SA nodes.
18. Which part of an earthworm's closed circulatory system gets oxygen from the environment?
- lungs
  - gills.
  - dorsal vessel.
  - skin.
19. During the P wave of an electrocardiogram
- the atria contract
  - the ventricles relax.
  - the AV valves close.
  - the AV node fires.
20. Which heart chamber has the thickest walls?
- The left atrium.
  - The right atrium.
  - The left ventricle.
  - The right ventricle.
21. During the second heart sound ("dup")?
- the AV valves are closing.
  - the ventricles are relaxing.
  - an ECG is recording a QRS wave.
  - the TA node is okay.
22. When taking blood pressure, the sound heard in the stethoscope is produced by the
- snapping shut of heart valves.
  - turbulence of blood squeezing past the cuff
  - blood flowing smoothly in an open artery.
  - the contraction of heart muscle.
23. By definition, high blood pressure is
- systolic over 60.
  - diastolic over 90.
  - systolic 120.
  - anabolic over 150.
24. An action potential does **not** fade out as it moves along an axon because the action potential
- has a voltage that is proportional to the size of the stimulus that generated it..
  - throws open the sodium gates in the neighboring axon membrane.
  - is traveling toward the cell body.
  - is attracted to the positive charges inside the synaptic end bulbs.
25. In which organism does oxygenated blood go directly to the body cells without first returning to the heart?
- a fish.
  - a frog.
  - a reptile.
  - a mammal.

26. What do axons and nephrons have in common?
- Both have glomeruli.
  - Both have synaptic vesicles.
  - Both have sodium pumps.
  - They have nothing in common.
27. Which part of the neuron converts an electrical signal into a chemical signal?
- the dendrites
  - the cell body.
  - the analog.
  - the synaptic end bulbs.
28. What enables the brain to distinguish action potentials (APs) carrying information about vision from other action potentials?
- APs about light have a taller “spike”.
  - APs from the eye are faster than 1 millisecond.
  - During embryonic development, the axons of the optic nerve grow out of the brain.
  - The brain can’t tell the difference.
29. Dr. Morrison was able to use an insecticide to kill the wasps in the nest without killing himself. This is because wasps and humans have different
- deactivating enzymes.
  - neuromuscular junctions.
  - excitatory neurotransmitters.
  - outerwear (Dr. M. wore gloves.).
30. Synaptic vesicles are most abundant in
- the end bulbs of the presynaptic cell.
  - the synaptic gap.
  - the dendrites of the presynaptic cell.
  - the receptors on the post-synaptic cell.
31. At an excitatory synapse, which of the following drugs would have a *calming* effect on the post-synaptic cell?
- A drug that blocks the action of deactivating enzyme.
  - A drug that blocks the reuptake of neurotransmitter from the gap.
  - A drug that speeds up the packaging of neurotransmitter into synaptic vesicles.
  - A drug that binds to post-synaptic receptor sites but does not open the sodium gate there.
32. What carries neurotransmitter across the synaptic gap?
- Active transport.
  - Receptors
  - Enzymes
  - Diffusion
33. Cocaine blocks
- diffusion of neurotransmitter.
  - enucleation of neurotransmitter.
  - regeneration of neurotransmitter.
  - reuptake of neurotransmitter
34. The image of an object focused on the retina
- is conveyed to the brain point-by-point.
  - is divided into components that are sent to different parts of the brain.
  - is sent first to the hippocampus for analysis.
  - has a copy of the image stored at a central location in the visual cortex.
35. Why do boxers sometimes “see stars” when hit in the jaw?
- Our brains try to make sense of even random nerve impulses coming from the visual cortex.
  - The boxer is unconscious and dreaming.
  - The boxer is having a near death experience.
  - The boxer is having an out-of-body experience.
36. V.S. Ramachandran discovered that a sensory “map” of the amputated hand develops on the face because
- axons from the hand pass through the face on the way to the brain.
  - the size and shape of the action potentials from the face and hand are very similar.
  - sensory input from the face and hand end up side-by-side on the sensory cortex of the brain.
  - the patient’s visual cortex is tricked by the mirror image.
37. The symptoms of puffer fish poisoning are caused by the tetrodotoxin blocking
- sodium gates in the axons of motor neurons.
  - bloodflow to the coronary arteries.
  - the opening of seminal vesicles in the synapse
  - the transport of oxygen by hemoglobin.

38. President Reagan had a “roto-rooter” operation to avoid having to remove his
- vas deferens.
  - prostate gland.
  - bulbourethral gland.
  - seminiferous tubules.
39. Urine tests for pregnancy detect a hormone produced by
- the yolk sac.
  - the amnion.
  - the chorion.
  - the allantois.
40. Cleavage of the zygote produces
- the follicular (nurse) cells.
  - the oocytes.
  - the zona pellucida.
  - the inner embryonic cell mass.
41. What observation about human embryos suggests that humans evolved from egg-laying ancestors?
- the human ovum contains no yolk.
  - the human embryo develops a yolk sac.
  - the human cleavage pattern is even.
  - the human embryos have shells.
42. In males, the hormone FSH
- stimulates sperm production.
  - triggers the release of sperm.
  - stimulates testosterone production.
  - produces about 45% of the semen.
43. In which choice is the primary germ layer **incorrectly** paired with the structure it becomes?
- ectoderm: brain
  - endoderm: stomach
  - mesoderm: kidneys
  - ectoderm: muscles
44. In the placenta, what membrane separates the mother and baby’s blood up until labor begins?
- the amnion.
  - the allantois.
  - the chorion
  - the yolk sac
45. In which choice is the structure **incorrectly** paired with the developmental process most directly responsible for it?
- blastula: cleavage
  - primitive streak: gastrulation
  - gills slits: primary induction
  - lens of eye: secondary induction
46. A birth defect in which the neural tube fails to close properly is called
- spinectomy.
  - spina bifida.
  - meningitis.
  - cerebral palsy.
47. Which two extra-embryonic membranes in chicks and humans contain blood vessels?
- Allantois and amnion.
  - Allantois and yolk sac.
  - Yolk sac and amnion.
  - Allantois only.
48. In the human embryo, the first pair of gill pouches develops into
- the Eustacean tube.
  - the tonsils.
  - gills (only temporarily).
  - the thymus gland.
49. In 1973 the US Supreme Court
- made all abortions illegal in the 1<sup>st</sup> trimester.
  - made all abortions legal in the 2<sup>nd</sup> trimester.
  - set “quickening” as the cut off for abortions.
  - set guidelines for state abortion laws.
50. The *longest* “stage of labor” involves the
- delivery of the placenta.
  - delivery of the baby.
  - dilation of the cervix.
  - doing the episiotomy.