

# SOUTH PLAINS MATH & SCIENCE COMPETITION

## BIOLOGY 1

### General Information:

- Check to see that you have written your name on the label and that the test name on the label matches the name on this booklet.
- **DO NOT** open the test booklet and **DO NOT** start until the proctor says "begin."
- Each individual exam period will be 45 minutes and each exam contains 40 multiple choice questions.
- Students are allowed to use a non-programmable battery operated calculator during the individual and team exams.
- Students are encouraged to write on the exam booklet. Scratch paper and pencils will also be provided.
- Students will not be permitted to leave the test room while the test is in progress. If a student finishes early, he/she must remain in the test room until the exam period is completed.
- If you need to ask a question during the test, raise your hand and the proctor will come to you.
- There is no penalty for skipping a problem. The exam scores will be determined by the number of correct answers. All ties will be broken by awarding the place to the contestant who has the most consecutive correct answers before a problem is missed.
- **Students may NOT keep the test booklet.**

1. Which stage of meiosis would a scientist expect to find tetrads?
  - a. Interphase
  - b. Metaphase I
  - c. Anaphase I
  - d. Metaphase II
  - e. none of the above
  
2. Which of the following best describes transcription?
  - a. DNA is replicated.
  - b. DNA codes for RNA.
  - c. RNA codes for amino acids.
  - d. Amino acids fold to create polypeptides.
  - e. none of the above
  
3. Which of the following is not a type of muscle?
  - a. Cardiac
  - b. Smooth
  - c. Striated
  - d. Skeletal
  - e. none of the above
  
4. Which of the following is not a member of Phylum Mollusca?
  - a. Oysters
  - b. Snails
  - c. Octopus
  - d. Squid
  - e. none of the above
  
5. Which of the following is not an action of the sympathetic system?
  - a. Speeds up heart beat
  - b. Constricts arteries
  - c. Slows down peristalsis
  - d. Relaxes urinary bladder
  - e. None of the above
  
6. Which member of the Kingdom Protista has a characteristic stigma?
  - a. Diatom
  - b. Euglena
  - c. Paramecium
  - d. Dinoflagellate
  - e. None of the above
  
7. Which of the following cells have axon and dendrite components?
  - a. Xylem
  - b. Lymphocytes
  - c. Pancreatic cells
  - d. Neurons
  - e. None of the above

8. Gram-stains determine the relative amounts of \_\_\_\_\_ in bacterial cell walls.
- Polypeptides
  - 1,4-glucaldehydes
  - Peptidoglycan
  - Cellulose
  - None of the above
9. Which of the following organelles' primary function is lipid production?
- Golgi apparatus
  - Microbodies
  - Rough endoplasmic reticulum
  - Smooth endoplasmic reticulum
  - none of the above
10. The general equation for photosynthesis is \_\_\_\_\_.
- $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$
  - $C_6H_{12}O_6 + 6H_2O \rightarrow 6O_2 + 6CO_2$
  - $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$
  - $6CO_2 + 6H_2O + 6O_2 \rightarrow CH_4 + H_2O$
  - none of the above
11. Abscisic acid most likely \_\_\_\_\_.
- Inhibits growth
  - Opens the stomata
  - Promotes growth
  - Promotes seed germination
  - none of the above
12. Where are the adrenal glands located?
- Behind the hypothalamus
  - Near the kidneys
  - Attached to the duodenum
  - Below the ovaries
  - none of the above
13. Which of the following best describes a consumer?
- Anabaena
  - Autotroph
  - Heterotroph
  - Plant
  - none of the above
14. The stage of the cell cycle that is the lengthiest is \_\_\_\_\_.
- Cytokinesis
  - Interphase
  - Metaphase
  - Mitosis
  - None of the above

15. When crossing a homozygous dominant red rose with a homozygous recessive white rose the botanist created 100% pink roses. Which of the following best explains this scenario?
- Multiple alleles
  - Co-dominance
  - Incomplete dominance
  - Mendelian genetics
  - None of the above
16. The codon, which signals the beginning of translation, is \_\_\_\_\_.
- methionine
  - AUG
  - TAC
  - UAC
  - None of the above
17. Which molecule was originally believed to carry the genetic code?
- Protein
  - Lipid
  - Carbohydrate
  - Nucleic acid
  - None of the above
18. Which of the following ion-exchange systems is most linked with the opening and closing of stomata?
- Calcium channels
  - ADP + P production
  - Sodium-potassium pump
  - Sodium-chlorine pump
  - None of the above
19. Which of the following is not composed of globular protein?
- Centrioles
  - Cilia
  - Cytoplasm
  - Flagella
  - none of the above
20. When a homozygous recessive white-eyed fly is crossed with a heterozygous red-eyed fly, the expected phenotypic ratio is \_\_\_\_\_.
- 9:3:3:1
  - 75% red eyes, 25% white eyes
  - 50% Rr, 50% rr
  - 1:1
  - none of the above
21. An organism's genome consists of 35% cytosine. What percent of the genome is thymine?
- 15%
  - 35%
  - 70%
  - can't be determined
  - none of the above

22. mRNA processing occurs \_\_\_\_\_.
- Following transcription
  - Only in prokaryotes
  - During translation
  - During mitosis
  - none of the above
23. Which is not part of the cell theory?
- All cells must come from preexisting cells.
  - Cells are the smallest unit of life.
  - All living things are made of cells.
  - All cells must have nuclear DNA.
  - none of the above
24. Which cellular respiration process produces the most number of ATP molecules?
- Fermentation
  - Glycolysis
  - Krebs cycle
  - Electron transport system
  - none of the above. They all produce 2 ATP molecules.
25. Facultative aerobes are microorganisms that \_\_\_\_\_.
- Require oxygen
  - Lyse in the presence of oxygen
  - Does not react to the presence or the lack of oxygen
  - Reacts only to sulfur-based compounds
  - none of the above
26. Which of the following cells is derived from a B cell?
- Cytotoxic T-cell
  - Memory cell
  - Helper T-cell
  - Primary stem cell
  - none of the above
27. An environment that is primarily frozen subsoil, frozen desert, with swamps and ponds is best described as \_\_\_\_\_.
- Deciduous rain forest
  - Savannah
  - Taiga
  - Tundra
  - none of the above

28. Which of the following organisms might one expect to find metamorphosis?
- Amphibians
  - Arthropods
  - Humans
  - Plants
  - none of the above
29. A prothallus is found most commonly in which of the following organisms?
- Fern
  - Ivy
  - Pennywort
  - Wheat
  - none of the above
30. Which scientist(s) is/are credited with the fluid mosaic model?
- Meselson and Stahl
  - Sanger
  - Singer and Nicholson
  - Watson and Crick
  - None of the above
31. Which of the following have a strong affinity for oxygen?
- Lymphocyte
  - Blastocyst
  - Erythrocyte
  - Phagocyte
  - None of the above
32. Which of the following plant families is most involved with nitrogen fixation?
- Apiaceae
  - Fabaceae
  - Laminaceae
  - Rosaceae
  - None of the above
33. Which of the following is a vestigial structure found in humans?
- Appendix
  - Kidney
  - Tonsil
  - Large intestine
  - None of the above
34. Trisomy 21 produces the condition known as \_\_\_\_\_.
- Turner's syndrome
  - Down syndrome
  - Klinefelter's syndrome
  - Testicular feminization syndrome
  - None of the above

35. Which cell is most likely involved in the transpiration of water in a tree?
- Sieve cell
  - Companion cell
  - Vessel
  - Pith
  - None of the above
36. Which piece of equipment is most likely used to transfer bacterial samples from one Petri dish to another?
- Stirring rod
  - Forceps
  - Inoculating loop
  - Microvials
  - None of the above
37. Which of the following spectrums are absorbed during light reactions?
- 680 and 700 nm
  - 700 and 710 nm
  - 500 and 600 nm
  - 420 and 680 nm
  - None of the above
38. What are the byproducts of fermentation in animals?
- Adenosine diphosphate
  - Carbon dioxide
  - Lactic acid
  - Ethyl alcohol
  - None of the above
39. A person with homozygous A blood type cannot have a child who has \_\_\_\_\_.
- A blood type
  - AB blood type
  - Both AB or O blood type
  - Both A or B type
  - Both O or B blood types
40. Which of the following acts will increase the speed of a reaction?
- Increasing heat
  - Decreasing heat
  - Adding an enzyme
  - Answers A and B
  - Answers A and C

**End of Test**