SCIENCE SCHOLARS ACADEMY | SSA

S.5 BIOLOGY EXAM

CONTENT CHECK

END OF TERM 1

2 hours, 30 minutes

Instructions:

- ***Attempt all question flashcards!***

PART 1

1. *State the **two major groups** of **chemicals of life**.*
2. *What are **inorganic chemicals** of life?*
3. *Give **four examples** of **inorganic chemicals** of life.*
4. *What are **organic chemicals** of life?*
5. *Give **four examples** of **organic chemicals** of life.*
6. *What are **macronutrients?***
7. *Give **three examples** of **macronutrients**.*
8. *What are **micronutrients?***
9. *Give **two examples** of **micronutrients.***
10. *State the **ultimate source** of **chemicals of life**.*
11. *State the **most abundant compound** in organisms.*
12. *Approximately what **percentage of a human cell** is water?*
13. *Approximately what **percentage of the human body** is water?*
14. *Describe the **shape** of a water molecule.*
15. *What is the **approximate bond angle** in water?*

16. *Why does **oxygen** carry a **partial negative charge** in water?*
17. *Why do **hydrogen** atoms carry **partial positive charges** in water?*
18. *Why is **water** described as a **dipole**?*
19. *What **weak bond forms** between **water molecules**?*
20. *Between which atoms do **hydrogen bonds** and **covalent bonds** form in water?*
21. *State **one significance** of **hydrogen bonding** in water.*
22. *Name **two isotopes** found in water.*
23. *Why is **heavy water heavier** than **ordinary water**?*
24. *Why may heavy water be **harmful** to living organisms?*
25. *Why is water an **excellent solvent** for **ionic substances**?*
26. *Give **one example** of an **ionic substance** soluble in water.*
27. *Give **one example** of a **non-ionic polar substance** soluble in water.*
28. *What **happens** to **salt** when **dissolved in water**?*
29. *State **four systems** where dissolved substances are transported in water.*
30. *Why does **water repel non-polar** substances?*
31. *How does water help **fertilization** in **man**?*
32. *Name **one seed** dispersed by water.*
33. *How does water cause **turgidity** in plants?*
34. *What is the role of water in **photosynthesis**?*
35. *Define **transpiration.***
36. *What **substance(s)** are **translocated** in plants using water?*
37. *How does water help **seed germination**?*
38. *State **one example** of water as a **lubricant** in **animals.***
39. *Name **one animal** that uses **hydrostatic skeleton.***
40. *How do **tears protect the eye**?*

41. *What is the **protective role** of **mucus**?*
42. *Why is it important that water is **liquid at room temperature**?*
43. *How does **incompressibility** help **worms**?*
44. *How does **incompressibility** support which **type of plants**?*
45. *Why does **water** support a **whale better than air**?*
46. *Why does **ice float on water**?*
47. *Why is **floating ice biologically important**?*
48. *Why is **cohesion** important in **xylem transport**?*
49. *Why can **water skaters** move on **water surface**?*
50. *Why is **high tensile strength** important in **xylem vessels**?*
51. *Why does **water column not break easily in xylem**?*
52. *Why is **adhesion** important in **capillary action**?*
53. *State **one metabolic process** requiring **water as a reactant**.*
54. *Why can **aquatic plants photosynthesize underwater**?*
55. *Why can **aquatic animals hunt prey**?*
56. *What comes to your mind when you see the word **viscosity**?*
57. *Why is **low viscosity of water advantageous** in **transport**?*
58. *Why can **water flow** through **narrow vessels easily**?*
59. *Define **hydrolysis.***
60. *What **percentage of cell dry mass** is due to **macromolecules**?*

PART II

1. *Define **cytology**.*
2. *Define a **cell**.*
3. *State the **main points** of the **modern cell theory**.*
4. *Why are cells considered the smallest units capable of independent life?*
5. *Explain why cells perform different functions despite having similar basic structure.*
6. *Name the two major types of cells.*
7. *Distinguish between prokaryotic and eukaryotic cells.*
8. *State four characteristics of prokaryotic cells.*
9. *Why are prokaryotic cells regarded as primitive cells?*
10. *State the size range of most prokaryotic cells.*
11. *Describe the DNA arrangement in prokaryotic cells.*
12. *What is a nucleoid?*
13. *What are plasmids?*
14. *State three functions of plasmids in bacteria.*
15. *How do plasmids contribute to antibiotic resistance?*
16. *What type of ribosomes are found in prokaryotes?*
17. *State the function of ribosomes in bacterial cells.*
18. *Name five membrane-bound organelles absent in prokaryotes.*
19. *Why do prokaryotes lack a true nucleus?*
20. *What replaces mitochondria in many bacteria?*
21. *State two functions of mesosomes.*
22. *What is the chemical composition of bacterial cell wall?*
23. *State three functions of the bacterial cell wall.*
24. *Why does the bacterial cell wall prevent bursting in dilute conditions?*

25. *What is peptidoglycan also called?*
26. *What is a bacterial capsule?*
27. *State three functions of the bacterial capsule.*
28. *How does a capsule protect bacteria from leucocytes?*
29. *Why does a capsule help bacteria survive dry conditions?*
30. *What is the importance of capsule in bacterial adhesion?*
31. *What is a bacterial flagellum?*
32. *State the function of a flagellum in bacteria.*
33. *How does bacterial flagellum differ from eukaryotic flagellum?*
34. *What are pili (fimbriae)?*
35. *State two functions of pili.*
36. *State two functions of the bacterial cell membrane.*
37. *Why is the bacterial cell membrane important in respiration?*
38. *What are photosynthetic lamellae/chromatophores?*
39. *State the role of bacteriochlorophyll in bacteria.*
40. *Which bacteria possess photosynthetic membranes?*
41. *What are lipid droplets in bacteria?*
42. *State the function of glycogen granules in bacteria.*
43. *Why do bacteria store food reserves?*
44. *Why do bacteria not form phagocytic vesicles?*
45. *Why are lysosomes absent in prokaryotes?*
46. *What is Kingdom Monera?*
47. *Name the two main phyla formerly included in Monera.*
48. *Why were Archaea and Eubacteria once grouped together?*
49. *Who proposed separation of Archaea and Bacteria based on rRNA?*

50. State the three domains of life.

51. Why are Archaea considered more related to eukaryotes than bacteria?

52. State six reasons why bacteria are abundant in nature.