1. What is biology?
2. What are the basic characteristics of a living organisms?
3. What is a cell? What are the two types of cell?
4. What is biotechnology? state it’s two principles.
5. Write 5 applications of biotechnology?
6. Differentiate between spontaneous and non-spontaneous generation of life?
7. What is primordial soup?
8. Describe the Urey-miller experiment?
9. Which biomolecule originated first and why?
10. What is catalytic RNA?
11. What are stromatolites?
12. Where did life originate?
13. What are the capabilities of a unicellular organisms?
14. Which scientist derived the term “animalcules”.
15. Who first saw and described a living cell and who discovered the nucleus?
16. Expand pplo.
17. What are the similarities between eukaryotic and prokaryotic cell?
18. Distinguish between eukaryotic and prokaryotic cell.
19. Give the bacterial classification based on structure?
20. Describe the bacterial cell envelope.
21. Distinguish between gram positive and gram negative bacteria.
22. What are inclusion bodies?
23. Give features of eukaryotic cells.
24. Distinguish between plant and animal cells.
25. Distinguish between prokaryotic and eukaryotic chromosomes.
26. What is the cell membrane composed of? Give its basic functions.
27. How are proteins classified on the basis of fluid mosaic model?
28. What are porins?
29. Distinguish between active, facilitated transport and simple diffusion.
30. What are symports, uniport and antiport?
31. Give structural properties of cell wall.
32. What is the endomembrane system?

* Give functions of: RER
* SER
* GOLGI BODIES
* LYSOSOMES
* VACUOLES
* MITOCHONDRIA
* PLASTIDS
* PEROXISOMES
* RIBOSOMES
* CYTOSKELETON
* CENTRIOLES & CENTROMERE

1. Classify the chromosomes into its four types.
2. Why does RBC have no mitochondria?
3. Distinguish between mitochondrial DNA and nuclear DNA.
4. Give the cell theory proposed by SCHLEIDEN & SCHWANN.
5. What addition did RUDOLF VIRCHOW make to the cell theory?
6. Give the basic cell cycle.
7. What is karyokinesis and cytokinesis?
8. Why does a cell divide?
9. What is amitosis?
10. Distinguish between mitosis and meiosis.
11. Explain why the chromosomal number changes in meiosis?
12. What is HAPLOID DIPLOID CHROMATIN CHROMATID SPINDLE FIBRE CROSSING OVER.
13. What are reducing sugars?
14. Distinguish between cellulose, starch and glycogen.
15. What are saturated and unsaturated fatty acids?
16. What are cis and trans fats?
17. Give the four structures of proteins.
18. What are motifs and domains?
19. Give functions of proteins.
20. What is denaturing of proteins?
21. What are nucleotides?
22. What are purines and pyrimidines?
23. Give the structure properties of DNA.
24. What are Chargaff’s rules?
25. Give examples from life to explain the two laws of thermodynamics.
26. Why are metabolic reactions coupled?
27. Differentiate between endergonic and exergonic reactions.
28. What are metabolic pathways? Explain catabolic and anabolic reactions.
29. What is phosphorylation?
30. What are the different types of cellular work?
31. Distinguish between cyclic and non-cyclic photophosphorylation.
32. What is chemiosmosis in respiration and photosynthesis?
33. Describe the Calvin cycle and its 3 stages.
34. Expand RUBP.
35. What factors does photosynthesis depend on?
36. What is photorespiration?
37. Distinguish between C3, C4 and CAM.
38. How many ATPs are produced from NADPH and FAD?
39. What is glycolysis?
40. Give the various fates of pyruvates.
41. Give the balance sheet of glycolysis.
42. What is respiration quotient?
43. What are biomaterials?
44. What are the basic properties of biomaterials?
45. What is bio-compatibility?
46. Describe the AMES test.
47. Distinguish between carcinogen and mutagen.
48. Distinguish between in-vitro & in-vivo.
49. What is rDNA and rDNA technology?
50. What are the 6 steps of rDNA technology?
51. Describe the genetic transformation and screening process.
52. What is PCR, PCR mix, PCR cycle, forward and reverse primer?
53. Design the forward and reverse primer of \_\_\_\_\_\_\_\_.
54. What is RT-PCR?
55. What are vectors?
56. What are the different types of vectors?
57. What are the requirements of a vector?
58. What are restriction enzymes?
59. How are restriction enzymes named?
60. What is ligation?
61. Differentiate between selection and screening?
62. What are the different screening techniques?
63. What is bt cotton?
64. What is bioinformatics?
65. What was human genome project.?
66. What is Moore’s law?
67. What are the components of human genome?
68. How can knowledge of one’s DNA sequence helps?
69. What conclusions can be drawn from next generation sequencing era?
70. What is genome analysis?
71. What is transcriptome? What is transcriptome analysis?
72. Give the application of bioinformatics.
73. What is the role of bioinformatician?
74. What is the use of bioinformatics in in-silico biology?
75. What are the different types of classification of databases for bioinformatics?
76. What is pair wise alignment?
77. What is BLOSUM algorithm?