



KEEPING MOBILE PHONE/SMART WATCH, EVEN IN "OFF" POSITION, IS TREATED AS EXAM MALPRACTICE
General Instructions: 1. Draw neat diagrams wherever necessary.
2. Write the specific points relevant to the questions.

Answer any TEN Questions

(10 X 10 = 100 Marks)

1. In your lab, you have the facility of scanning electron microscopy, light microscopy and fluorescent microscopy, your microbiology course instructor has given an assignment on viruses. She has given three different viruses, and you have to determine the shape of the three viruses using any of the above mentioned microscopes. Which microscope will you use to observe the morphology of viruses? Justify your answer with proper explanation. Also add a note on the principle of microscopy you have used to identify the structure of viruses.
2. Describe the golden age of microbiology (1850-1915) and any of the scientific discovery or contributions during this era.
3. a) Relate autoclave and steam sterilization. [6]
b) Why is the standard autoclave temperature set to 121°C? [2]
c) Autoclaving kills viruses-This statement is true or false. Justify your answer. [2]
4. a) How Blood agar medium acts as an enriched and differential medium. Explain with suitable examples. [5]
b) Nutrient agar is a basal and complex medium-True or false. Justify the reason with proper explanation. [5]
5. Compare and contrast the following bacteria based on its cell wall: *E.coli*, *Staphylococcus aureus*, Methanogenic bacteria, *Mycobacterium tuberculosis* and *Mycoplasma*.
6. a) You perform an endospore stain on an unknown culture and only observe pink cells. Can you conclude definitively that this is not an endospore-forming bacteria? Explain. [2]
b) If you use endospore stain with *B. megaterium* cells and you didn't see green-colored structures in these cells, what are the two possible explanations for this observation? What can you do to improve your chances of seeing something green? [4]
c) After staining, why do endospores appear green but the rest of the cells pink? [4]
7. Classify viruses based on its nucleic acid composition, replication sense and mechanism.
8. a) What is the difference between ATCC, MTCC and NCTC? [4]
b) List any five microbial collection centres in India. Also add a note on its role and responsibilities. [6]

9. Calculate the mean growth rate and generation time of a culture that increases from 10^2 to 10^8 cells in 10 hours. Explain in detail about the mathematics of logarithmic growth.
10. a) What is meant by the concept of the "final electron acceptor"? [2]
b) What are the final electron acceptors in aerobic, anaerobic, and fermentative metabolism? [3]
c) Compare & contrast aerobic and anaerobic respiration of bacteria. [5]
11. a) Differentiate the following with suitable examples: [5]
Pathogen, Opportunistic pathogen and Normal microbiota.
b) List any five major water borne diseases and its causative agents. [5]
12. Discuss on any one area from INDUSTRIAL MICROBIOLOGY that you found most interesting? Why did you find it interesting? Explain with appropriate examples.

