53 (FPT 301) BSMC

2016

BASIC MICROBIOLOGY

Paper : FPT 301

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1. *(i)* Fill in the blanks : 1×5=5

   (a) ———— acts as the solidifying agent in any solid media.

   (b) For most bacteria the optimum pH for growth lies between ———— and ————.

   (c) The coloration of bacteria by applying a single solution of stain to a fixed screen is called ———.

(d) ——— proposed the three domain clarification.

(ii) Answer in ***one*** *or* ***two*** sentence(s) : 1×10=10

(a) Why are microorganisms stained ?

(b) What is a resolving power of a microscope ?

(c) What is photosynthesis ?

(d) What is spontaneous generation ?

(e) Why Mitochondria is known as the power house of a cell ?

(f) What is the function of siderophores ?

(g) Why pure cultures are important ?

(h) Why 70% alcohol is used as disinfectant instead of absolute alcohol.

(i) What do you understand by quorum sensing ?

(j) Give an example of culture media which is both selective and differential media.

(iii) Write and explain *any one* method of isolating pure culture. Also quote the advantages and disadvantages of that technique. 5

2. (i) Distinguish between : 2×5=10

(a) Cilia and flagella

(b) Autotrophs and heterotrophs

(c) Binary fission and fragmentation

(d) Simple staining and gram-staining

(e) Mesophills and Thermophiles

(ii) What is a fixed, stained smear ? Write the *three* steps of fixed, stained smear preparation. What are the advantages of this procedure ? 1+3+3=7

(iii) Name *any three* different staining techniques and write their particular applications. 3

3. (i) Draw a typical bacterial growth curve and label the various phases. Discuss each and every phase in detail. 10

(ii) Write true *or* false. 1×5=5

(a) The increase in population during bacterial reproduction is by geometric progression 2^n.

(b) During continuous culture of bacteria the growth is maintained in the log phase.

(c) The plate count method for enumeration of bacteria expresses the result in colony forming unit per *ml*.

(d) Microbial strain can be maintained with a single culture without transfering it to fresh medium.

(e) Depending on the species, the colony surface texture varies.

(iii) Write the procedure of gram-staining of bacteria. 5

4. (i) Define the following terms : 1×5=5

(a) Sterilization

(b) Pasteurization

(c) Disinfection

(d) Plasmolysis

(e) Dessication.

(ii) Describe how sterilization can be achieved by application of moist heat (in an Autoclave) with neat diagram. 7

(iii) What are ionizing and non-ionizing radiations ? Discuss the mechanism of both types citing *one* example each. 2+6=8

5. (i) Write short notes : 4×3=12

(a) High level germicides

(b) Intermediate level Disinfectants and Antiseptics.

(c) Low level Disinfectant

(ii) What are intrinsic and extrinsic factors ? How they influence the microbial growth in food ? Explain. 2+6=8

6. *(i)* Write about the chemical composition of DNA. 5

(ii) Draw the structure of a DNA given by Watson and Crick and explain. 5

(iii) Match the following : 1×5=5

A	B
(a) Yeast	*(a)* A bacterium
(b) Pseudomonas	*(b)* Eukaryotic organism
(c) Ethylene dioxide	*(c)* Cell wall
(d) Peptidoglycan	*(d)* Suicidal bag
(e) Lysosome	*(e)* Gaseous disinfectant

(iv) Write the full form : 1×5=5

(a) TMV

(b) CFU

(c) RNA

(d) PFU

(e) ABC transporters.

7. *(i)* What is a Virus ? Write in brief about their general features. 1+5=6

(ii) Explain the lytic and lysogenic cycles of a bacteriophage with proper diagram. 6

(iii) Write short notes on : 4×2=8

(a) Sporulation

(b) Archaebacteria.