[51/A-24] Seat No: _____ No. of printed pages: 3

SARDAR PATEL UNIVERSITY
B.Sc. (III - Semester) (Microbiology) Examination
Thursday, 22nd November, 2018
2.00 pm - 5.00 pm
US03CMIC01 - Fundamentals of Microbiology - I

Total Marks : 70

Instructions: (1) It is compulsory to attempt all six questions.

(3) Marks of each question are indicated on the right.

(4) Draw figures wherever necessary.

(5) Answer MCQ and short questions precisely.

Q. 1 Answer the following multiple choice questions: **(10)**

1. Antony van Leeuwenhoek described microscopic organisms as:
   (a) Very little animalcules (b) Very large animalcules
   (c) Protists (d) None of the above
2. Who developed the drug known as "magic bullet 606"?
   (a) Paul Ehrlich (b) S. A. Waksman
   (c) Joseph Lister (d) Robert Koch
3. Congo red is an example of _____ dye.
   (a) acidic (b) neutral
   (c) basic (d) none of above
4. Which is an example of acid-fast bacteria?
   (a) *Bacillus subtilis* (b) *Mycobacterium tuberculosis*
   (c) *Escherichia coli* (d) *Micrococcus luteus*
5. Which bacteria are star shaped?
   (a) Diplococcus. (b) Haloarcula spp.
   (c) Stella spp. (d) Thiomargarita spp.
6. The capsule of *Bacillus anthracis* is made up of:
   (a) Popypeptides (b) Polysaccharides
   (c) Lipids (d) Dextran
7. Which type of ribosome is consisting of 50S and 30S subunits?
   (a) 70S (b) 80S
   (c) 90S (d) 100S
8. Which part of light microscope is used to control the light from light source?
   (a) Condensor (b) Eye piece
   (c) Objective lens (d) None of the above

(P.T.O.)

9. When θ is 32^0, the NA of low power objective lens is _____
   (a) 0.6 (b) 0.8
   (c) 1.33 (d) 2.1
10. Which microscopic technique provides 3D images of a bacterial cell?
   (a) TEM (b) SEM
   (c) Dark-field microscopy (d) Bright-field microscopy

Q. 2 Answer the following in short: (Attempt any ten) **(20)**

1. Write contribution of M. W. Beijerinck in agriculture microbiology.
2. What is attenuated culture?
3. Give contribution of any two scientists in molecular biology.
4. Differentiate between dyes and stains.
5. Write importance of fixation in staining process.
6. What is vital staining?
7. Give four examples of endospore forming bacteria.
8. Explain the term: Spheroplast and Protoplast.
9. Give functions of pili in bacteria.
10. Give the formula used to determine NA of an objective lens.
11. Write principle of phase contrast microscopy.
12. What is dark field microscopy? Give its use.

Q. 3 Discuss contributions of Louis Pasteur in development of microbiology. **(10)**

OR

Q. 3 (A) Discuss Koch's postulates. **(04)**

(B) Write note on development in the field of laboratory techniques. **(06)**

Q. 4 (A) Draw structure of a typical bacterial cell and label it. (03)

(B) Explain the mechanism of Gram staining technique. (07)

OR

Q. 4 (A) Describe in detail role of mordents in staining process. (06)

(B) Write a note on negative staining. (04)

Q. 5 (A) Describe ultra structure of flagella of Gram negative bacteria. (04)

(B) Describe cell wall of Gram positive bacteria. (06)

OR

Q. 5 Write note on:

(A) Bacterial capsules. (05)

(B) Cytoplasmic inclusions of bacteria. (05)

Q. 6 (A) Discuss principle and working of fluorescence microscopy. (06)

(B) Discuss limitations of electron microscopy. (04)

OR

Q. 6 Write note on:

(A) Resolving power of light microscope. (05)

(B) Principle and working of SEM. (05)