

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2019  
(First Semester)

Branch - MICROBIOLOGY

**PRINCIPLES OF MICROBIOLOGICAL METHODS**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

- 1 A nanometer is equivalent to  
(i) thousandth of a millimeter (ii) millionth of a meter  
(iii) thousandth of a meter (iv) billionth of a meter
- 2 Among the smallest bacteria are three groups known as rickettsiae, chlamydiae and  
(i) Mycobacterium (ii) Mycoplasma  
(iii) sakina (iv) spirochetes
- 3 The maximum magnification available to most bright field microscope is  
(i) one million times (ii) one thousand times  
(iii) one hundred thousand times (iv) ten times
- 4 Immersion oil has a refractive index indential to that of  
(i) air (ii) glass  
(iii) cytoplasm (iv) water
- 5 Dry heat is often used to sterilize  
(i) saline solution (ii) bacterial media  
(iii) oily material (iv) hospital blankets
- 6 The primary effect of ultraviolet radiation is on microbial  
(i) carbohydrate (ii) enzymes  
(iii) nuclic acids (iv) cell wall
- 7 In order for alcohol to be used effectively as a control agent ,it must be used as a  
(i) a 10% solution (ii) 5 minutes exposure must take place  
(iii) mixed with butyl alcohol (iv) complete immersion is required
- 8 In clinical practice ethylene oxide is widely used to  
(i) Sterilize plastics (ii) disinfect table tops  
(iii) kill bacteria on skin surface (iv) sterilize chemical
- 9 A differential medium is one in which  
(i) fungi and view grow differently  
(ii) two different bacteria can be distinguished  
(iii) a particular nutrient is used differently by two different bacteria  
(iv) two different temperatures are used in the incubation period
- 10 Agar used in bacteriological media is  
(i) a source of polysaccharide to bacteria  
(ii) a solidifying agent  
(iii) provides anaerobic condition (iv) enhances growth of bacteria

Cont...

**SECTION - B (35 Marks)**Answer **ALL** Questions**ALL** Questions Carry **EQUAL** Marks

(5 x 7 = 35)

- 11 a In what units are most microorganism measured?  
How do bacteria and viruses, Fungi and Protozoa compare to one another in size.
- OR
- b What sizes and shapes do the bacteria have? Are there any variations that occur within the basic shapes. How is the shape of a bacterium determined?.
- 12 a What is resolution, how is it determined? What is refracture index & how can the problem posed by the refracture index be solved in a light microscope.
- OR
- b How are microorganisms prepared for staining?  
What are the biochemical basis of staining?
- 13 a What is the effect on microorganisms when moist heat is used as compared to dry heat?
- OR
- b Describe the types of radiations used as antimicrobial control agents.
- 14 a Are there any dyes or gases or chemicals used to achieve sterilization.
- OR
- b Why are most antimicrobial chemical agents disinfectants rather than sterilants. Describe the general characteristics of a disinfectant.
- 15 a For what do aerobes use oxygen? Why is  $O_2$  toxic to many microbes and how do they protect themselves?
- OR
- b Describe he following kinds of media with examples.  
(i) synthetic media (ii) complex media (iii) enriched media

**SECTION - C (30 Marks)**Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks

(3 x 10 = 30)

- 16 What principle does the electron microscope use to achieve ultrahigh magnifications? Explain the salient differences between TEM and SEM.
- 17 Describe the five types of Oxygen relationships seen in microorganisms.
- 18 Describe the mechanism of action, effectiveness, applications of halogens, Quaternary ammonia compounds and phenolics.
- 19 How would you visualize bacterial capsules, flagella and endospores?.
- 20 Heat sensitive materials can be pasteurized -Explain the methods of pasteurization.