2. MICROBIOLOGY

1. Define Micro Biology.
   - It is science that deals with the structure, shape, reproductive methods, culture techniques of micro organisms and bacteria and virus.

2. What is the use of pure culture?
   - To separate out single cells of a strain of bacteria.
   - Used in fermentation of alcohol and fixation of N\textsubscript{2} in soil by bacteria.
   - It is bases of modern micro biology.

3. What is diploid cell culture?
   - Diploid cells are derived from lungs, kidney of embryonic cells. Used in the manufacture of vaccine as a host cells.

4. What is Amoebiosis?
   - An internal protozovan parasite of the class – sarcodina
   - It is caused by Endomoeba histolitica
   - It causes Amoebic dysentry.

5. What is zoo- Anthroponoses?
   - Infection from Animals to Human.
   - Man is an important link in the life style. e.g. Taenia soliam

6. Mention important Anti Biotics.
   - Amphicilin
   - Erithromicin
   - Streptomycin

7. Diagnostic test of AIDS?
   - ELISA test and WESTERN BLOT test.
   - Wester blot test confirms AIDS

8. What is zoonoses?
   - Parasitic infection from animals to human. E.g. Rabies
9. What is pure culture?
   ➢ By serial dilution method a single cell separated out from a colony and cultured and isolated.

10. What is Lytic, Lysogenic cycle?
   ➢ In Lytic cycle the bacterial cell walls is dissolved
   ➢ In Lysogenic cycle viral genome integrates with bacterial genome

11. Mention the inventions of Louie Pasteur?
   ➢ Germ Theory of Disease
   ➢ Vaccination for Rabies, Chicken pox, Cholera, Anthrax in Sheep
   ➢ Pasteurization of milk

12. Mention the contributions of Koch?
   ➢ Solidified media
   ➢ Discovered the pathogens of Tuberculosis, Diphtheria and Tetanus.
   ➢ His finding also lead to immunization therapy.

13. What is CHICKEN EMBRYO TECHNIQUE?
   ➢ Fertilized eggs of 5-12 days are chosen.
   ➢ Virus is inoculated in to the egg and incubated at a temperature of 36° C.
   ➢ The whole is sealed by paraffin.

14. Why virus is called an obligate parasite?
   ➢ Virus could not be cultured in artificial media
   ➢ It could be cultured only in live plant or animal cells and hence are called obligate parasites

15. What is an Oncogenic virus?
   ➢ Virus that causes cancer is called Oncogenic virus. E.g. Adeno virus, poliyoma virus. RNA virus – roves sarcoma.

16. How Rabbis spreads?
   ➢ Rabbis infected animals like dogs, bats when they bite normal healthy domestic and wild animals it spreads.
17. What are the symptoms of Rabbis?
   - High fever and headache.
   - Hydrophobia
   - Nervoussness

18. Write short notes on Variola virus
   - It is a smallpox virus.
   - Its spread through droplets.
   - Vaccine contain Vaccinia.

19. What are the Various shapes of Bacteria?
   - Coccus - Round shaped
   - Baccillus - Rod shaped
   - Vibrio - Comma shape
   - Spirillum - Spiral shaped

20. What is a Synthetic media?
   - Synthetic media is a chemical media made of carbohydrates, protein, vitamins, nucleic acid etc.
   - Its supports the nutrient requirements of micro organisms.

21. What is bacterial Transformation?
   - The genetic information is transferred from one bacterial cell to another.
   - It was discovered by Griffith in 1928.

22. What is Transduction?
   - In Transduction, a Bacteriophages act as a vector transfer a portion of DNA from one bacterium (donor) to another (recipient).

23. What is generalized Transduction and specialized Transduction?
   - If all fragments of bacterial DNA have a chance to enter in a transduction phage, the process is called Generalized transduction.
   - If a few restricted genes of the bacterial chromosomes are transduced by bacteriophage, it is called specialized transduction.
24. What are the symptoms of cholera?
   - Vomiting
   - Rice water stool
   - Loss of minerals

25. What are the two types of plague?
   - caused by *Yersinia pestis*
   - There are two types of plagues. They are *Bubonic plague* and *Pneumonic plague*.

26. Write short notes on Syphilis?
   - It is caused by *Treponema pallidium*.
   - Transmitted by direct sexual contact
   - It will lead to blindness, loss of hearing, etc.

27. Write short notes on Gonorrhea?
   - It is caused by *Neisseria gonorrhoea*.
   - In the males the primary site of infection is the urethra.
   - In the female it is the cervix.
   - It causes pain during urination.
   - Other symptoms are fever, abdominal pain, arthritis, meningitis etc.

28. Give particulars about other protozoan diseases? Other pathogenic protozoans
   - *Trypanosoma gambiens* - causes African sleeping sickness
   - *Leishmania donovani* - causes kala azar
   - *Leishmania tropica* - skin leishmaniasis

29. Mention the types of Malaria.
   - Vivax malaria, caused by *Plasmodium vivax*.
   - Quartan Malaria caused by *Plasmodium malariae*
   - Ovale Malaria caused by *Plasmodium ovale*
   - Malignant Tertian caused by *Plasmodium falciparum*

30. What is Chemotherapy?
   The control and treatment of infectious diseases with a chemical compound or drug is called *chemotherapy*. 
31. Draw HIV and Label the parts.

32. What is Antibiotic?
   - The word antibiotic refers to a metabolic product of one microorganism that in very small amounts is detrimental or inhibitory to other microorganisms.

33. What are the two types of Antibiotics?
   - Bacteriostatic – It controls bacteria.
   - Bacteriocidal – It kills bacteria.

34. Write short notes on Pox virus?
   - Pox viruses are the largest of all viruses and are brick shaped.
   - They contain double stranded DNA, protein and lipid.
   - They have a dumbbell shaped nucleoid surrounded by two membrane layers.

35. What is primary culture?
   - When cells from these tissues are processed and cultured the first monolayer is referred to as the primary culture.
   - A monolayer is a confluent layer of cells covering the surface of a culture vessel.

36. Mention the types of Genetic recombination in bacteria?
   - Bacterial conjugation, Transformation and Transduction.

37. Define – Medical MicroBiology?
   - The Medical microbiology deals with aspects of infection, causative agents of infection and the diseases due to infection.
38. What is black water fever?
   - The *Plasmodium falciparum* infection is black water fever.
   - It is characterized by the whole some destruction of patients RBC and the excretion of liberated haemoglobin in the urine.

39. Write short note on Anthroponoses?
   - Infections with parasites species that are maintained in man alone. E.g, Malaria and Filaria.

40. Uses of medical Microbiology?
   - Innumerable infections diseases that haunt the human population where discovered. Drugs and Vaccines have been found.

5 MARKS QUESTIONS AND ANSWERS

2 MICROBIOLOGY

1. Briefly describe the structure of virus?

   **Structure of Viruses:**

   **Isohedral (E.g: Polio)**
   - Spherical in shape.
   - Surface is lattice with identical Triangular unit.

   **Helical: E.g: TMV**
   - Contains fringes made up of Glycoprotein.
   - Nucleic acids are covered by Capsomeres.
   - The nucleo capsid is a flexible structure packed within a fringed lipoprotein envelope.
2. Write short notes on Virus diseases in man?

**Rabies:**
- Virus belongs to Rhabido family.
- Transmit from a bite of an animals like Dog, etc.
- Symptoms: Headache, High fever, Hydrophobia, etc.

**Pox:**
- Caused by Variola virus.
- Infect directly or Handling articles infected by the person.
- Vaccine consist of vaccinia.

3. Enumerate the adaptation of pathogenic microbes?
- Pathogens are able to selectively attach to the external surfaces such as the skin and conjunctiva or the internal surfaces such as the mucus membranes of the respiratory, etc.
- They also penetrate the above body surfaces and gain access to the internal tissues.
- In some infections, the pathogen may remain localized, growing near its point of entry into the body.
- Some pathogens become widely distributed in different tissues or organs. This is called generalized infections.
- Some other pathogens can grow within the cells of host, causing severe disturbances to normal physiological processes.

4. Write the symptoms of AIDS defined by WHO?
- 10% of body weight loss.
- Fever more than a month.
- Diarrhoea more than a month.
- Loss of memory.
- Night sweats.
- An unusual cancer.
5. Write short note on control of AIDS?
   - Screening of blood and blood products.
   - Education to people about do’s and don’ts in AIDS
   - Education about protected sexual behaviour and practices
   - Participation of voluntary agencies, teachers, NGOs, etc. in AIDS awareness programmes.
   - Making the antiretroviral drugs such as AZTs (Azidothymidine/Zidovudin) and saquinovir etc.,

6. Write a note on the contribution of Louis Pasteur?
   - He developed methods of sterilization and of pasteurization.
   - Pasteur (1857) observed different kind of microbes associated with different kinds of fermentation.
   - His crowning achievements were Pasteurisation of milk.
   - He developed vaccines, for the control of “cholera” “anthrax” and “rabies” in man.

7. Describe the structure of HIV and how it was discovered? Structure of HIV:
   - Spherical in shape.
   - 100 – 140 nm in size.
   - gp 120 made up of 20 pentagons and 12 hexagons.
   - gp 41 is made up of over 100 amino acids.
   - Contains two helix of RNA with Reverse Transcriptase.
   - Also contains HLA antigens.
   - Genetic material is surrounded by a protein made up of Glycoprotein.
8. What are the characteristics of a good Chemotherapy?
➢ The control and treatment of infectious diseases with a chemical compound or drug is called chemotherapy.
➢ It prevents the activity of a disease causing pathogen, without injuring the host tissues.
➢ It leaves the hosts natural defense or such as phagocytosis.
➢ It is able to penetrate the cells and encounter the pathogens.
➢ It kills or inhibits the pathogenic microbes without harm to the host.

9. Describe the cultural techniques of virus.
Viral cultures are of three types viz., Primary cell cultures, diploid cell strains and continuous cell lines.

1. Primary culture:
➢ When cells from these tissues are processed and cultured the first monolayer is referred to as the primary culture.

Diploid cell strain:
➢ Diploid cell strains are derived by primary cell cultures from a specific tissues like lung or kidney which is of embryonic origin.
➢ These diploid cells are the most employed host of choice for the production of human vaccine virus.

Continuous cell lines:
➢ Continuous cell lines are capable of an infinite number of doublings.
➢ Such cell lines may arise with the mutation of a cell strain or more commonly from the established cell cultures from malignant tissue.
➢ Many viruses, which are difficult or impossible to grow have been cultured in continuous cell lines.
10. State the stages of for the preparation of bacterial cultural media.
The preparation of bacteriological media involves the following steps.
1. Each ingredient or the complete dehydrated medium is dissolved in the appropriate volume of distilled water.
2. The pH of medium is determined.
3. Agar is added and the medium (solid medium) is boiled to dissolve agar.
4. The medium is dispersed in flasks or tubes.
5. The medium is sterilized by autoclaving.

11. Write notes on bacterial diseases. (Any two diseases)

Cholera:
- Caused by *Vibrio cholera*.
- Transmitted from food and water.
- Symptoms – Vomiting, Rice water stool, etc.

Plague:
- Caused by *yersinia pestis*.
- Bubonic plague – inflamed lymph glands.
- Pneumonic plague – pneumonia with watery sputum and red streak of blood.
- Symptoms – Vomiting, fever, nausea, etc.