Solved Final Term Paper BT102 – 2018

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Virtualian Zoologists

REPEATED QUESTIONS

Mcqs

epidimology
Apidemics
Microbiology
70%ethNol
Rhodophyta
Thallus is the algae body
Fungi are absorptiv in natr

BT102 Microbiology
What is Fluorochromes...2
Buffer....2
What is Coenzyme and examples....3
Components of LPC....3
Label parts of ELEctron microscope....5
Names of Endospore parts....5
.
MCQs.
1. Acellular... viruses
2. Resolution of Electron Microscope....0.2nm
3. Ribosomes made up of... mRNA nd protein
4. Rings of basal body of gram negatives.....4
5. Gram negative appears on stain...red
6. Basic dye.... methylene blue
7. Robrthook draws microbe in....pta ni
8. Rat bite fever caused by.... Spirillum minus
9. High salt concentration used by obligat halophiles.... 30%
10. Small small colonies type name...

11. Direct count method...membrane filter
12. Study of fungi...mycology
13. Standard condition for hot air oven....170*C for 2hours
14. Autoclaving at... ?121*C 15psi 120min
15. EtO do not use...1500mg/ml
16. Optimum pH for molds is...5 -6

Peripheral proteins----------loosely connected and soluble in water
Plasmid--------extrachromosomal circular DNA

Mesophils optimum temp. **is 37**
Unicellular fungi is **yeast**
Asexual spores are formed by mitosis
Mycobiont is---------**fungi**
ELISA is used for **Antigen and antibody**
Western blotting is used for **proteins**
Consistently present but with low incidence **endemic**
Which is not belong to innate immunity **specific**
Which is not lymphocyte **monocytes**
Which is not belong to ELISA **Probe**
which do not grow in the presence of O_2 **Obligate anaerobes**
the process in hot air sterilization is **oxidation**
which is not a method of direct count **Spectrophotometer**
persisitent infection --------**Viruses replicate slowly**
cell wall is absent in **mycoplasma**

1. Hot air oven temperature is 170degree for 2 hour
2. Example of binguanides is chlorohexidine
3. Bacteriophage is virus infecting bacteria
4. Sight of entry through which microorganism enter body?
5. Plasmid is single stranded or double
6. Lime disease is caused by:
7. Proteins are separated by gel electrophoresis
8. Structural support is provided by core polysaccharides
9. Cell wall is absent in mycoplasma
10. Alpha hemolysis gives greenish halo colour
11. Study of fungi is mycology
12. 30S ribosome contain 2rRNA
13. 70 % alcohol is more effective
14. Microbiology definition
15. Epidemiology
16. Algal body is thallus
17. Obligate halophiles live in30% salt
18. Specimen or sample is placed on stage
19. Mycobacterium is stained by acid fast staining

20. Pilli transfer DNA from one bacterium to other
21. Half of the dry weight of microbe is carbon
22. Hot air method is 121 degree at 15psi for 20min
23. Peripheral proteins are loosly connected and soluble in water
24. Mesophils optimum temperature is 37
25. A sexual spore is formed by mitosis or meiosis
26. Mycobiont is fungi
27. Elisa is used for antigen and antibody
28. Consistently present but with low incidence is endemic
29. Which not belong to innate immunity? Specific
30. Which is not lymphocyte? Monocytes
31. Probe not belong to elisa
32. Process in hot air sterilization is oxidation
33. Spectrophotometer is not a method of direct count
34. Virus replicates slowly
35. Cell wall absent in mycoplasma
36. Water molecules pass through aquaporines

1. Virulence

The extent of pathogenicity is called virulence of a pathogen.

2. Name the three subgroups of spiral bacteria

These are curved shaped bacteria. They are further divided into 3 more subgroups.

a. Vibrio: curved rods
b. Spirillum: Helical but rigid
c. Spirochete: Helical but flexible

Spirochetes move by axial filaments which are enclosed by the outer membrane

3. flagellm and function (2

Flagellum: Long filamentous structure that propels bacteria
It helps the bacteria in movement.

4. Name the Types of Bacteria on the basis of Oxygen Requirement

a. **Obligate Aerobes:** Do not grow without oxygen. It is necessary.
b. **Facultative Anaerobes:** Oxygen is necessary but start become anaerobes in its absence and can grow without of O_2.
c. **Obligate Anaerobes:** Cannot grow in the presence of oxygen.
d. **Aerotolerant aerobes:** Do not need O_2, also do not bother its presence
e. **Microaerophiles:** Aerobes but need small amount of oxygen. Cannot grow if available in large amount.

5. virus virion and viroid (3)

viroids

These are infectious agents that consist only of RNA and found in plants only. They are covalently closed circular ssRNAs about 250 nucleotides long. They do not code for any gene. They cause the disease by RNA silencing process.

virusoids

They are similar to viroids; however, they encode one or two gene products and need a helper virus to infect the host cells. The helper virus supplies gene products and other materials needed by the virusoid for completion of its replication cycle. Hepatitis D virusoid is a typical example which uses Hepatitis B virus as a helper.

prions

These are proteinaceous infectious particles that cause neurodegenerative diseases such as scrapie in sheep, bovine spongiform encephlopthy, and Kuru in humans

6. conjugation, transformation and transduction (3)

Transformation

Naked DNA in solution is transferred from one bacterium to another during this process.

Conjugation

Genes transfer process can be mediated by plasmids. Plasmids are extra chromosomal circular DNA fragments that replicate independently of bacterial chromosome. Conjugation requires direct cell to cell contact and cells have to be opposite mating types.

Transduction

Transferring of a gene from a bacterium to another bacterium via a virus is called transduction. o When a bacteriophage infects a bacterium such as E. coli, it replicates inside E. coli and also produces a protein coat (which is called a capsid) in which viral DNA is packed before the virus is released.

7. how disease can be transmitd (5)

Direct Transmission: person to person physical contact is a direct contact. Influenza spread is a typical example.

Indirect Transmission: A nonliving object is involved. Objects in the use of a patient such as handkerchief, utensils, pillow and bedding are called fomites. These can transmit organisms to susceptible individuals.

Droplet Transmission: Mucus droplets are created when you sneeze for example. These droplets carry organisms that may infect another individual who comes in contact with the droplets. One sneeze may produce 20,000 droplets. Influenza can be spread by this route.

Vehicle Transmission: Transmission of disease agents by a medium, such as water, food, or air. Other media include blood and other body fluids, drugs, and intravenous fluids. •

What are Vectors? A vector is a vehicle (animate or inanimate) that carries a pathogen from one host to another.
Arthropods are vectors for many diseases. There are two ways these arthropods can transmit organisms to susceptible hosts:
Mechanical Transmission: In this type of transmission, organisms stick to the body parts of insects and get transmitted passively from one location to another.
Biological Transmission: Microbes multiply in the insect and is transmitted actively by insect bites from one individual to another

8. Any two microbial identification method (5)
Classical or Conventional Method
Serological testing
Nucleic acid based testing … plz See detail on 49 to 54 lessons on handouts
9. epidemiology and methods (5)
The study of where and when diseases occur and how they are transmitted in a population
Descriptive Epidemiology: (recording the data about disease). It includes location and time of cases of disease, gender, health, age of patients etc. (Basically, frequency and distribution of risk factors in population are recorded). Prevalence and incidence of disease are typical examples. Such studies can be retrospective (after they occur) or prospective (before they occur). So, in summary, in descriptive epidemiology, information about an already existing disease is recorded.
Analytical Epidemiology: It relates to determining the cause of the disease. Analysis of data, mode of transmission of diseases and means to prevent diseases also come in this discipline. Such studies can be done with case control methods in which factors that have preceded the disease are determined. A group of people who have the disease is compared with another group of people in the same location who are free of the disease. A Cohort method tracks two groups forward from exposure to outcome. Cohort study compares the experience of a group exposed to the factor with another group not exposed to the factor. An association between exposure and its outcome is determined which makes it easy to see the risk factor involved. In other words, cohort studies begin with a group of people (a cohort) free of disease. The people in the cohort are grouped by whether or not they are exposed to a potential cause of disease. The whole cohort is followed over time to see if the development of new cases of the disease (or other outcome) differs between the groups with and without exposure.
Experimental Epidemiology: A hypothesis relating to a disease is tested in this approach. For example, smoking cause cancer can be tested by designing

an experiment in mice in which they are exposed to certain levels of smoke over time and then the outcome is observed. Another example will be testing of a drug for prevention of a disease.

10.Magnetostome (5)

Inclusions of iron oxide
Surrounded by invaginations of plasma membrane
Present in G negative bacteria
Act like a magnet. Bacteria can stick to iron containing rocks for nutrition.
Decompose H_2O_2 which is toxic for cells.

11.Define immunity, difference between innate and adaptive immunity in Detail (10)

Immunity: Ability of the body to protect itself from harmful effects of diseases whereas **Susceptibility** is the lack of immunity which provides the pathogens easy establishment to cause the diseases

Types of Immunity

Innate (Natural):

Present at birth: One is born with these defenses, so it is present without any exposure to the microbes. That is the reason, it is non-specific.

Rapid to respond: Because it is already there, it interacts with the microbes as soon as they enter the body.

Nonspecific: It means that it does not differentiate if it is an E. coli or a Staph or Salmonella. Body defense system against these entire pathogens acts in a similar fashion. In other words, the same macrophage can phagocytize E. coli, Staph or Salmonella at the same time (if these pathogens are present there).

Does Not Have Memory. Do not increase in responses to the repeated exposure to the same agent. Therefore, it has no memory.

First line of defense: Physical barriers (skin, mucus membrane) provide the first line of defense as they prevent the entry of the organisms by providing a physical barrier which if broken will let the microbes go inside.

Second line of defense: Phagocytes and their secretions provide a second line of barriers for microbes. So, if microbes succeed in breaking the first barrier, macrophages, neutro-phils and such other cells phagocytize these microbes and kill them before these can establish infection in the body.

Adaptive (Acquired): It is the third line of defense. It is acquired by experience and specific to an organism.

Specific: It means that antibodies made against E. coli will destroy E. coli only, and will not do any harm to a Staph for example.

Have memory: It means if antibodies have once been made against E. coli, this exposure will be remembered by the body, and if a second encounter is made with the same type of E. coli again, the body would mount a heightened

immune response against E. coli because it has memory cells developed in the body which upon second stimulation proliferate quickly and mount a greater defensive response.

Increases with repeated exposure: Because of memory, body's immune response increase with every repeated exposure. It has a limit also!

Slower to respond: For the first time exposure, the body's response is slower and takes a long time compared with the innate immunity which is immediate.

Adaptive Immune Response can further be divided into:

Humoral immune response (antibody response by B cells or lymphocytes) and **Cellular immune response** (T cells are made which kills microbial harboring cells)

12.cell membrane function

- Selective permeable barrier
- Passive and Active Transport
- Respiration in microbes (bacteria)
- Photosynthesis in microbes
- Lipid synthesis
- Cell wall parts are transported by a molecule called bactoprenol which is present in the plasma membrane.
- PM has many receptors in it with which various ligands can bind and initiate signals for gene expression etc.

13.Glycoclyx, its composition and function

It is the outermost layer of the cell wall, viscous and gelatinous in nature that surrounds the cells. It is composed of polysaccharide and polypeptide or both.

If glycocalyx is organized and firmly attached to the cell, it is called a capsule. – Plays important role in virulence (degree of pathogenicity) – Can also be a part of the vaccine against the bacteria to which it belongs.

Glycocalyx is also part of biofilms that bacteria make to attach to surfaces. Bacteria secrete extracellular polymeric substance (EPS)

Biofilm protects cells within it.

It also facilitates communication amongst cells

If glycocalyx is loosely attached to the cell, it is called slime.

14.Differentiate between vertical and horizontal gene transfer and name three horizontal gene transfers

Vertical Gene Transfer:

This is a normal way of transferring genes from parents to offspring. This happens when a cell divides. Each daughter cell receives exactly what its parent cell has.

Horizontal Gene Transfer:

When genes are transferred from cells to cells within the same species, the process is called horizontal gene transfer. This can happen between cells of the same species, or across different species of organisms. Horizontal gene transfer involves a donor and a recipient cell. The recipient cell then incorporates received DNA into its own genome and this genome becomes a recombinant molecule or recombinant DNA. The cell that has this recombinant DNA in it is called a recombinant cell. Three processes are known by which genes can be transferred horizontally from one cell to the other, and they include:

1. Transformation
2. Conjugation
3. Transduction

15.three types of passive movement

Diffusion

Facilitated Difussion

Osmosis…..Plz See detail in handouts Lesson 21 page 50

16.Economic benefits of fungi

Saccharomyces are used for alcoholic beverages under anaerobic conditions and if incubated aerobically, it is used in bread making because it metabolizes glucose to produce CO_2 (some ethanol is also produced but gets evaporated during baking) which expands the dough causing it to rise.

This yeast is also extensively used for molecular biology work and **vaccine production.**

Vitamin C is obtained from *Aspergillus niger*.

Cellulase from *Trichoderma*

A**ntibiotics** from many fungi and anticancer *Taxol* from *Taxomyces* are some other examples of useful fungal products.

Entomophaga (kills gypsy moth), hence is used as a biological pest control.

Mushrooms can be cooked and eaten as a source of proteins for humans.

17.Pili and its functions

These are hair-like structure composed of pilin, usually one to ten in number.

Longer than fimbriae

Used for attachment to:

Host cells

Bacteria

Used for DNA transfer from one bacterium to another during Conjugation (Sex pili)

Also function in twitching Motility

Gliding Motility is also the function of the pili.

18.physical nature of media 2

- Solid Media
- Liquid Media

19.plasmogamy, karyogamy and Meiosis 2

1**. Plasmogamy:** A haploid nucleus of a donor cell (+) penetrates the cytoplasm of a recipient cell (-). Both cells are haploid (one set of chromosomes)

2. **Karyogamy:** The (+) and (-) nuclei fuse to form a diploid zygote nucleus.

3. Meiosis: The diploid nucleus gives rise to haploid nuclei (sexual spores).

20.germination of spore, 5

Exosporium: A thin delicate outermost covering of the spore

Spore coat: 2 nd layer underneath the exosporium. It is thick and composed of several protein layers.

Resistant to chemicals

It contains enzymes for germination. Germination of spores into vegetative form occurs when environment becomes favorable for their growth.

Cortex: It is the 3rd layer from outside in. It has peptidoglycan in it.

Spore cell wall or core wall: Surrounds the protoplast or spore core

Spore core: Contains nucleoid and ribosomes

21.Give two advantages of solid media in bactrial culturing.2

Solidification of the medium is done for purifying organisms from each other as solid medium provides surface for individual colonies to grow well separated from each other.

Secondly, the solid media are used to study the colony characteristics.

22.Types of microscopy 5

- Dark field microscopy
- Phase contrast microscopy
- Fluorescent microscopy
- Transmission electron microscopy
- Scanning electron microscope

23.Writes stages of respiration of glucose 3

Glycolysis: Oxidation of glucose to pyruvic acid

Krebs cycle: Oxidation of acetyl CoA to CO2

Electron Transport Chain: Coenzymes that carry electrons from Krebs cycle or glycolysis are oxidized to create ATP.