BT 102 Final term Subjective

Q1) Hypersensitivity and it's types. 10 Marks

Hypersensitivity:

Abnormal antigenic response

- Allergy: another name
- Those antigens are called allergens.
- Immune system acts in a damaging manner.

Types of Hypersensitivity:

- Type I (Anaphylactic)
- Type II (Cytotoxic)
- Type III (Immune complex)
- Type IV (delayed cell mediated)

Type I (Anaphylactic)

Happens in <30 min.

- IgE is involved which binds to mast cells
- Mast cells degranulate and secretes mediators of inflammation.
- Histamine, leukotrienes, PG
- Shock from drug reactions
- Venoms
- Common allergens causing asthma Diagnosis by demonstration of IgE by i/d injections of allergens one by one.
- Quantitation of IgE by ELISA
- Rx: Epinephrine & antihistaminic drugs

Type II (Cytotoxic)

Involves

- Antigenic cell

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 IgG or IgM

 Complement

 Blood transfusion reaction is an example.

Diagnosis

 Cell deficiencies

 Low number of RBCs due to hemolysis

 Thrombocytopenia if platelets are involved.

Rx

Avoid those drugs that cause it.

 Blood transfusion with correct blood type

 Symptomatic treatment

Type III (Immune complex)

 Involves

 Soluble Antigen circulating in the serum

 IgG or sometimes IgM

 Complement

Diagnosis by history and symptoms

 Glomerulonephritis

 Confirmed by biopsy and testing of presence of IgG in kidney cells

 Rx. Corticosteroids

Type IV (delayed cell mediated)

• Originally called

tuberculin reaction

• Robert Koch performed the test.

• Contact dermatitis is the most common example.

Involves:

– Antigen

– T cells

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– Macrophages

• Transplant rejection is good example.

• Reaction to hair dye

Diagnosis:

– Skin testing

• Rx: symptomatic

• Avoid contact

Q2) Types of algae. **5 Marks**

Types of Algae:

There is various type of Algae are discussing below:

Phaeophyta (Kelp)

Brownish in colour.

- Cellulose and alginic acid cell walls
- Multicellular
- Chlorophyll a and c, xanthophylls
- Store carbohydrates
- Harvested for algin

Rhodophyta

- Reddish in color
- Cellulose cell walls
- Most are multicellular
- Chlorophyll a and d, phycobiliproteins
- Store glucose polymer
- Harvested for agar and carrageenan

Chlorophyta

- Green algae
- Cellulose cell walls

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- Unicellular or multicellular
- Chlorophyll a and b
- Store glucose polymer
- Believed to have given rise to terrestrial plants

Bacillariophyta

- Brownish in colour
- Pectin and silica cell walls
- Unicellular
- Chlorophyll a and c, carotene, xanthophylls

Store oil

- Fossilized diatoms formed oil
- Produce domoic acid

Dinoflagellata

- Brownish in color
- Cellulose in plasma membrane
- Unicellular
- Chlorophyll a and c, carotene, xanthins
- Store starch

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Q3) Define plaque. **2 Marks**

Plaque is an area where the virus infection has lysed the cells.

Q4) Economic benefits of fungi **3 Marks**

Citric acid: Aspergillus niger

• Cellulase: Trichoderma (plant cell digestion to clear fruit juices)

• Taxol: Taxomyces (anticancer)

• Biological pestcontrol:

Entomophaga (kills gypsy moth)

• Penicillin: Penicillium

Q5) Spectrum of drugs. **3 Marks**

• **Narrow:** targets only a group of organisms

– Penicillin for G+ve

• **Narrow:** well targeted

– Spare microflora

• **Wide:** Targets many groups of microbes

– Tetracycline

Wide: Targets every organism

– Destroy normal microflora as well

Q6) Consequence of viral infection **2 Marks**

Lysis of cells

• Microscopic and

Macroscopic Degenerative changes (Cytopathic Effects).

• Virulent infection: lysis of cells

• Latent infection: Virus does not replicate

• Persistent infection: Virus replicates but slowly

• Transformation: Tumor cells

Q7) what is Endemic, Epidemic and pandemic. **3 Marks**

 Endemic: consistently present, but with low incidence

 Infected ones are reservoir of infection

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 Epidemic: within an area, unusually high incidence of a disease

 Pandemic: Worldwide epidemic

Q8) Define Cytokines 2 Marks

Cytokines are released as a result of defense cell stimulation by PAMPs and TLRs interactions. Cytokines recruits more immune cells and also stimulate adaptive immune response.

Q9) Mechanism & stages of viral replication? 5 Marks

 Attachment: Viruses attach to cell membrane.

• Host cell receptors (determines the range of infectivity)

 Entry: Penetration by pinocytosis (plasma membrane folds inwards to from a vesicle)

• Fusion: Viral envelope fuse with plasma membrane and releases the capids into the cell's cytoplasm

 Uncoating: Separation of viral NA from its protein coat by viral or host enzymes.

– (undergoes eclipse period)

Mechanism

 Biosynthesis: Production of nucleic acid and proteins.

 Maturation: Nucleic acid and capsid proteins assemble.

 Release by budding (enveloped viruses) or rupture.

Q10) Epidemiology & Methods of epidemiology? 5 Marks

Epidemiology: The study of where and when diseases occur and how they are transmitted in a population.

Epidemiology Methods:

Descriptive:

 (Recording the data about disease)

 Location and time of cases of disease

 Gender, health, age of patients etc.

Analytical:

(To determine the cause of disease)

– Analysis of data

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– Mode of transmission and means to prevent disease

Experimental Epidemiology:

– Hypothesis of a disease is tested

– Application of Koch's postulates

Case reporting:

– Health care workers report specified disease to local, state, and national offices

– Incidence and prevalence of disease

Q11) Name two antifungal drugs? **2 Marks**

– Amphotericin B

– Ketoconazole

Q12) Name the drugs that inhibit the cell wall of fungi. **2 Marks**

Caspofungin, micafungin, and anidulafungin

Q13) Causes, diagnosis and treatment of anaphlyxis? **3 Marks**

Happens in <30 min.

- IgE is involved which binds to mast cells
- Mast cells degranulate and secretes mediators of inflammation.
- Histamine, leukotrienes, PG
- Shock from drug reactions
- Venoms
- Common allergens causing asthma Diagnosis by demonstration of IgE by i/d injections of allergens one by one.
- Quantitation of IgE by ELISA
- Rx: Epinephrine & antihistaminic drugs

Q14) What is fourth line generation of cephalosporin? **2 Marks**

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 Cephalosporins: Cefixime (4th gen)

Q15) Type III hypersensitivity and it's diagnosis. 3 Marks

Type III (Immune complex)

 Involves

 Soluble Antigen circulating in the serum

 IgG or sometimes IgM

 Complement

Diagnosis by history and symptoms

 Glomerulonephritis

 Confirmed by biopsy and testing of presence of IgG in kidney cells

 Rx. Corticosteroids

Q16) Capsomere. 2 Marks

Capsid is made up of protein subunits is called capsomeres.

– Arrangement of capsomeres is characteristic of a particular type of virus

Q17) How microbes enter into the body? 2 Marks

 Adhesion is mediated by adhesins or ligands to the receptors.

 Adhesins present on glycocalyx, pili, fimbriae, or flagella.

 These are glycoproteins or lipoprotein

Q18) Define Virus, virion and viroid. 3 Marks

Virus: infectious viral particle, composed of nucleic acid, surrounded by a protein coat called capsid.

Virion:

Outside of a cell, in the extracellular state, a virus is called a virion.

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Viroid:

- Infectious circular RNA of plants
- Formed of only RNA
- Protein coat is absent
- Smaller in size than a typical virus
- Infects plants only

Q19) Spore do not stain how they are stain? **5 Marks**

- Spores contain dipicolinic acid +Ca++
- Spores becomes heat resistant
- So, strong stains are used with heat

Procedure:

- Make a smear and air dry it.
- Fix the smear by heat.
- Heat water in a beaker.
- Place slide with smear side up.
- Pour malachite green on the slide.
- Keep it there on the boiling water beaker for 5 min.
- Wash the smear with dH2O.
- Counterstain with safranine for 30 sec.
- Observe under oil immersion lens

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Q20) Define Reverse transcription. **2 Marks**

A reverse transcriptase is an enzyme used to generate complementary DNA from an RNA template, a process termed reverse transcription.

Q21) Type II Hypersensitivity and its treatment? **5 Marks**

Type II (Cytotoxic)

Involves

- Antigenic cell
- IgG or IgM
- Complement
- Blood transfusion reaction is an example.

Diagnosis

- Cell deficiencies
- Low number of RBCs due to hemolysis
- Thrombocytopenia if platelets are involved.

Rx

Avoid those drugs that cause it.

- Blood transfusion with correct blood type
- Symptomatic treatment

Q22) Define morbidity, mortality and pathogenicity. **3 Marks**

Morbidity: Incidence of a disease

- Morbidity rate: Number of people affected in relation to the total population in a given time period.
- **Mortality:** Deaths from a disease
- Mortality rate: Number of deaths from a disease in relation to the population in a given time.

Pathogenicity: The ability to cause disease.

Q23) Vehicles of transmission? **2 Marks**

- Transmission by a medium
- Waterborne
- Foodborne
- Airborne
- Blood, other body secretion

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Q24) Use of antibodies in body defence the body? **2 Marks**

Ag-Ab Binding

Agglutination

• Opsonization

• Complement Activation

• Ab-dependent cell mediated cytotoxicity

• Neutralization

Q25) Define Clonal selection? **2 Marks**

B cells are selected by the antigen to secrete antibodies.

Q26) Distribution of MHC I and MHC II. **2 Marks**

• MHC I: Present on all nucleated cells

• MHC II: Present only on APCs (Antigen Presenting Cells)

Q27) Define Symbiosis. **2 Marks**

Symbiosis can be defined as living together is called symbiosis

Q28) How adaptive immunity was discovered? **2 Marks**

Observations: Individuals once recovered from smallpox, measles, or chickenpox become immune to it.

• Experiments led to antibodies discovery in serum and vaccination.

Q29) Write mode of action of chloramphenicol, streptomycin and tetracycline.
3 Marks

Target: Protein Synthesis Inhibition:

Chloramphenicol:

– Binds to 50S

– Inhibits peptide bonding

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– Bacteriostatic

Streptomycin:

– Change's shape of 30S

– Misreading of RNA codes

– Bacteriostatic

Tetracyclines:

– Interfere with attachment of tRNA to mRNA ribosome complex

– Bacteriostatic

Q30) Slime and capsule? 2 Marks

When extracellular material (glycocalyx) regular and thick, called capsule

When extracellular material (glycocalyx) loose and not organized, called slime

Q31) Disk diffusion Method. 2 Marks

• Disk Diffusion

Method:

• Standardized inoculum spread on agar plate

• Filter paper disks soaked with antibacterial

• Zone of inhibition is recorded

• Zone compared to a standard Table

Q32) Inflammation. 2 Marks

Damage to body tissues triggers a local defensive response

- Redness
- Pain
- Swelling
- Heat
- Histamine

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- Kinins
- Prostaglandins by damaged cells
- Leukotrienes by mast cells

Q33) Function of capsule and name the bacteria which form capsule. 2 Marks

Capsule: Impairs phagocytosis

- Antibodies can help

Only a few bacteria produce capsule

- Strep pneumoniae
- Klbesiella pneumoniae

Q34) Difference between epitope and antigen. 3 Marks

Antigen: A foreign substance that provokes immunity

• More specifically called as Immunogen

• Protein in nature

• Could be large polysaccharide

Epitopes: Specific regions on an antigen

– Also called as antigenic determinants

• Most antigens have MW >10,000 D

Q35) Bactericidal and bacteriostatic. 2 Marks

• Bactericidal:

– Kill microbes directly.

• Bacteriostatic:

– Prevent growth of microbes

Q36) Composition and distribution of microbes. 3 Marks

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- Nutrients
- Physical and chemical factors
- pH, O_2, CO_2
- Host defenses
- Stress, age

Q37) Infectious diseases by contact, vehicle and vector. 5 Marks

Contact Transmission

- Direct: person to person
- Physical contact
- Influenza
- Indirect: A non-living object is involved
- Fomite: any non-living object (towel, bedding)

Vehicle Transmission

- Transmission by a medium
- Waterborne
- Foodborne
- Airborne
- Blood, other body secretion

Vector

- Arthropods:
- Mechanical transmission (Passive)
- Biological transmission (Active)

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Q39) Incidence and prevalence. 2 Marks

Incidence: of new cases in a given time period in a population

Prevalence: New + existing cases

Q40) Antifungal drugs. 2 Marks

Fungal Sterols (PM)

- Polyenes
- Amphotericin B
- Used for systemic infections
- Azoles (inhibits synthesis of PM)

Q41) Algae and its structure. 3 Marks

Mostly aquatic (water is necessary for physical support, reproduction and diffusion of nutrients)

Cell covering thallus can carry photosynthesis

Some algae float by gas-filled bladders

Structure

Body of multicellular alga is called a thallus which consists of branched holdfasts (anchor alga to rock) stemlike hollow stipes and leaflike blades.

Q42) Acid fast staining. 3 Marks

1882, Paul Ehrlich observation on Mycobacterium'

- Make a smear
- Carbolfuchsin on slides
- Heat the slide for 5-10 min
- Wash with water and then with acid alcohol for 1 min.
- Counterstain with methylene blue for 1 min.
- See under the microscope.

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Q43) How disease can be transmitted all types. 5 Marks

Contact Transmission

- Direct: person to person
- Physical contact

- Influenza
- Indirect: A non-living object is involved
- Fomite: any non-living object (towel, bedding)

Vehicle Transmission

- Transmission by a medium
- Waterborne
- Foodborne
- Airborne
- Blood, other body secretion

Vector

- Arthropods:
- Mechanical transmission (Passive)
- Biological transmission (Active)

Q44) Protein inhibiting antibiotics names. **2 Marks**

– Chloramphenicol

– Erythromycin

– Tetracyclines

– Streptomycin

Q45) Types of symbiosis. **3 Marks**

1. Mutualism: both are benefited
2. Parasitism: one is harmed
3. Commensalism: One is benefited, other is unharmed

46) Routes of entry. **3 Marks**

- Skin: It is the largest organ of the body in terms of the surface area.
- Parenteral route: By injury

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 Preferred route of entry: Streptococci inhaled vs ingested

Q47) Factors affecting Location of Algae in the ocean. **2 Marks**

Their location in oceans depends on the availability of nutrients, wavelength of light and the surface on which to grow.

BT 102 Final term MCQ

1.Primary immune response produces mainly_____ antibodies. **IgG**

2.Mast cells degranulate and secretes mediators of inflammation. **Histamine, leukotrienes, PG**

3. Penicillin attacks_____ **Cell wall**

4.Thickness of capsule depends upon_____. **Culture conditions**

5.Each B cell has unique antibody molecules against **one** epitope only.

6.Antibodies have 2 heavy and_____ light chains. **Two**

7.**Epidemology** is study of diseases.

8.Viruses may have envelope outside. **Virion**

9.Metronidazole is Used for_____. **Giardiasis, Amebiasis, Trichomoniasis (ALL)**

10.Corticosteroid is used in_____. **Hypersensitivity III**

11.**10%** tannic acid is used as mordant.

12.Patient returns to normal in_____. **Convalescent period**

13.Algae produce **80%** O_2.

14.Food in refrigerator is spoiled by _____. **Psychrotroph**

15.Blood transfusion reaction is the example of_____. **Hypersensitivity II**

16.Tetracyclin is_____ broad spectrum. **Wide**

17.Persistent infection Virus replicates but _____ **slowly**.

18.Which one is not lymphocytes? **Monocytes**

19.Which is not innate immunity? **Specific**

20.Sight of entry_____. **Mucous membrane**

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21.Virusoids has no_____. **ssDNA**

22. Lyme is caused by_____. **Borrelia burgdorferi**

23. All terms are used to represent the forms of colonies except: **Convex**

24. All are used for indirect microbial count except: **Flow cytometer**

25. Microbiota contains_____. **Nutrients**

26. Infectious circular RNA of plant_____. **Viroid**

27. Which is not true for virusoids_____. **ds circular DNA**

28. Disease that is present consistently with low incidence_____. **Endemic**

29. ELISA technique_____. **Antigen or antibody detection**

30. Study of evolutionary history_____. **Systematics or Phylogeny**

31. Study of fungi_____. **Mycology**

32. In persistent infection_____. **Virus replicates but slowly**

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