

Bt102 solved past papers for mid term

Subject: Bt102 (past papers)

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Q1: Define two basic stains?

Basic dye: The color is in the positive ion **are** Crystal violet **and** Methylene blue

Q2: What are the Stages of germinated spore?

There are three stages of the germination spores these are

Activation: Prepares spore for germination. Heating can initiate it.

Germination: Spore starts swelling and losing its coats etc. **Metabolically active**

Outgrowth: New components are made.

Q3: mention the Five names of microscopy?

Darkfield microscopy, Phase contrast microscopy, Fluorescent microscopy,

Transmission electron microscopy **&** Scanning electron microscopy

Q4: mention the Five names of walls of endospore?

Endospores are Specialized resting cells, Highly durable, dehydrated forms of bacteria

walls of endospore:

1) Exosporium: A thin delicate covering

2) Spore coat: Thick, composed of several protein layers. Resistant to chemicals, Contains enzymes germination

3) Cortex: Has peptidoglycan

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

5) Spore core: Contains nucleoid and ribosomes.

Q5: What are the physical and chemical methods for making smear on the slide?

Using a platinum loop, a colony or a drop of broth culture can be smeared into a thin film

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on a glass slide for making a smear. Physical method: Heat and Chemical Methods: Ethanol or formaldehyde

Q6: What is microaerophiles?

These are Aerobes but O₂ is required in low amounts by them. **They** Produce O₂ toxic compounds if exposed to more O₂ **examples** Listeria, Vibrio

Q7: Name three subgroup of spiral bacterium?

- 1) Vibrio: curved rods
- 2) Spirillum: Helical but rigid
- 3) Spirochete: Helical but flexible Move by axial filaments

Q8: Name three steps of respiration of glucose?

Respiration of Glucose: Occurs in three stages: Glycolysis, The Krebs cycle, Electron transport chain

Q9: Differentiate between the differential and simple stain?

Simple stain :

only one stain is used.

- Methylene Blue staining
- **Stain is washed off.**
- **Microbes seen under the microscope.**
 - Methylene blue
 - Carbofuchsin
 - Crystal violet, and safranin
- **A mordant is added, sometimes**

Differential stain :

A couple of stains used.

- Gram Staining
- Differential stains react differently with different kinds of bacteria.**
- **Most common is Gram staining.**
- 1884, by Hans Christian Gram**

Q10: What are Pilli? Give its function?

The first external structure is the pilus plural pilli

A pili is a thin rigid fiber made of protein that protrudes from the cell surface the primary function of the pili is to attach a bacterial cell to specific surface or to other cells. These are Longer than fimbriae these are present One or two per cell

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Used for attachment:

- Host cells
- Bacteria

• **Used for attachment:**

- DNA transfer: Conjugation (Sex pili)
- Twitching Motility
- Gliding Motility

Q11: Name the five layers of endospore?

endospore are Specialized resting cells Highly durable, dehydrated forms of bacteria. they Formed inside a bacterium they Survive extremes of temperature

Exosporium: A thin delicate covering

Spore coat: Thick, composed of several protein layers – Resistant to chemicals – Contains enzymes germination

Cortex: Has peptidoglycan

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

Spore core: Contains nucleoid and ribosomes

Q12: Name five kingdoms?

Monera, Protista, Fungi, Plantae, animalia

Q13: Define Coenzyme and example?

Coenzyme and examples: A non protein compound that is necessary for the functioning of an enzyme. It binds with an enzyme and catalyzes a reaction Also called cofactors. Act as electron carriers they Receive electrons from nutrients they Donate electrons to other molecules in subsequent reactions examples NAD^+ NADP^+ FMN and FAD

Q14: What are Parts of endospore?

An outer proteinaceous coat surrounds the spores beneath this coat a thick layer of peptidoglycan called cortex is present.

Q15: what are Parts of flagella?

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Definition : Flagellum is a Long filamentous structure that propels bacteria

Parts: **Filament:** Flagellin, **Hook:** A different protein, **Basal Body:** The most complex

Q16: What is the refractive index?

Definition: Refractive Index is the Ability of a medium to bend the light. In which Light rays move in a straight line through a single medium. To increase contrast, we stain the specimen

Q17: What is buffer?

A containing either a weak acid and its salt or a weak base with its salt which is resistant to changes in the pH buffer is solution Buffers are used to maintain desired pH they neutralized the small quantities of additional acids or base

- Peptones and amino acids
- PBS

Q18: What is meant by resolution?

Definition: Ability of the lenses to distinguish between two closely lying objects as separate

- Light microscope resolving power is $0.2 \mu\text{m}$.
- n = refractive index, 1.5 for immersion oil

Q19: Define ribosome?

These are composed of proteins + ribosomal RNA. They have 2 subunits – 70S ribosomes

- 50S: one rRNA
- 30S: two rRNA

Q20: Write down types of bacteria?

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Staphylococcus, diplococcus, streptococcus, tetracoccus, sarcinia, basillus, vibrio, spilius

Q21: Write Cell membrane function and work?

Cell membrane is Selective permeable barrier

Work: Passive and Active Transport, Respiration, Photosynthesis, Lipid synthesis, Cell wall parts, Receptors

Q22: Write down groups and name classification of plants?

Flowering plants(angiosperms), conifers, ginkgos, cycads(gymnosperms), seedless plants(mosses, liverworts, horsetails, ferns)

Q23: What is agar? What are the characteristics?

Agar is a jelly like substance obtained from alga Derived from a sea weed these are Complex carb, not used by bacteria they Liquefies at 100 0C and solidifies at 40 0C

Q24: What is chemotaxis and phototaxis?

Chemotaxis:

**Is the movement of an organisms in response to a chemical stimulus
Example: somatic cells, bacteria, and other single cell or multicellular organisms direct their movements according to certain chemical in their movement.**

Phototaxis:

Is a kind of taxis or locomotory movement that occurs when a whole organism moves towards or away from stimulus of light. This is advantageous for the phototrophic organism as they can orient themselves most efficiently to receive light for photosynthesis

Q25: Define metachromatic granules?

In certain bacteria yeast yeastlike fungi and protozoa metachromatic granules appear red when stained with a blue dye. They are composed of complex polyphosphate, lipid and nucleoprotein molecules and serve as an intracellular phosphate reserve. they called metachromatic because they can

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take a color different from that of the dye.

- Also called volutin
- Large inclusions
- Stained red with methylene blue
- Contain inorganic phosphates
- Characteristics of *Corynebacterium diphtheriae*

Q26: Write the Subgroup of spiral bacteria?

Subgroup of spiral bacteria

Vibrio: curved rods

Spirillum: Helical but rigid

Spirochete: Helical but flexible Move by axial filaments

Q27: What are Methods used for viable counting of microbes?

Viable counting method Spread plate, Pour plate

Pour plate and spread method

Viable counting method Spread plate with serial dilutions

Measurement of cell mass

- Dry weight
- Spectrophotometry

Q28: Write the Characteristics of algae?

Absorb nutrients from water through their surfaces. Mostly photoautotrophs, a few are chemoheterotrophs

Q29: What is fimbriae, write its location and function?

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Fimbriae

Attachment to epithelial cells – *Neisseria gonorrhoeae* – E.coli O157: Diarrhea

Are bristal like Present to attach the host cells, Present in the large number.

Q30: Name of passive transportation?

Passive Movement

Simple diffusion: – Area of high conc. to low conc. – Until ions or molecules evenly distributed. Equilibrium

Osmosis

Facilitated diffusion

Q32: Write the characteristics of megnetosomes?

Magnetosomes

- Inclusions of iron oxide
- Surrounded by invaginations of plasma membrane
- Present in G negative bacteria – Act like magnet – Decompose H₂O₂

Q33: Write two major prokaryotes group?

Bacteria, archea

Q34: Write three advantages of staining?

Increases visibility of microbes

- Shape, size and arrangements
- Purity or contamination of a culture
- Differentiation and classification of microbes.

Q35: What are the function of illuminator, objective lenses and condenser?

Illuminator: is a light source

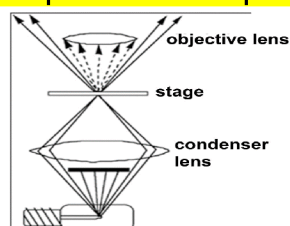
Condenser: Directs the light through the specimen

Objective Lenses: Close to the specimen Ocular Lens (Eyepiece): Close to the eye

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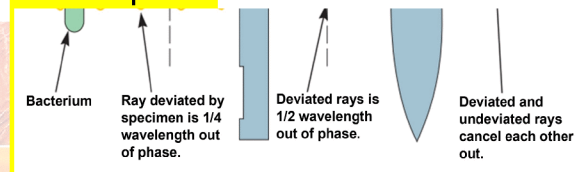
Q36: What is the difference between the dark field and phase contrast microscopy?

Uses a darkfield condenser having an opaque disk
• Used for unstained specimens suspended in liquids



Phase Contrast Microscopy

- Light rays can be in phase or
- out of phase



Q37: Bacteria how to get nitrogen for their growth??

How bacteria get N

Decomposing proteins NH_4^+ ions Nitrates Gaseous N_2 – Nitrogen fixation

Q38: What are Pilli? Give its function?

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Mcqs

- 1) Study of microbes is called Microbiology
- 2) 30s ribosome's contains how many rRNA 2

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- 3) Examples of coenzymes are _____ **NAD+, NADP+, FMN and FAD**
- 4) E-coli move with how many rms _____ **270 rms**
- 5) Rings of gram -ve bacteria _____ **2 (4 gram positive)**
- 6) Microscope first diagram was published in _____ **1665**
- 7) Study of fungi is called _____ **mycology**
- 8) Syphilis is caused by _____ **Treponema pallidum**
- 9) Kingdom Monera contain _____ **bacteria and archaea**

