Name:

**Microbiology Chapter 7/20**

**Review Guide**

**Microbial Growth Terms and Basics (7 Questions)**

1. What category of microbes do antimicrobial substances, such as antibiotics, affect?
2. What two reasons can make a disease difficult to treat?
3. Fill in the table below regarding terms related to microbial control.

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Definition** | **Kills Endospores (yes/no)** | **Example(s)** |
| **Sterilization** |  |  |  |
| **Disinfection** |  |  |  |
| **Antisepsis** |  |  |  |
| **Antibacterial** |  |  |  |

1. Fill in the table below regarding words related to microbial control.

|  |  |  |  |
| --- | --- | --- | --- |
| **Term** | **Definition of Suffix** | **Example** | **Will growth resume if the substance is removed? (Yes/No)** |
| -Cide/-Cidal |  |  |  |
| -Stat/-Static/-Stasis |  | Bacteriostatic- |  |

**Disk-Diffusion Testing of Antibiotics (3 Questions)**

1. Describe when you would utilize a Mueller-Hinton plate.
2. Example problem using table 25-1 in the lab manual.
   1. Staph: If the measured zones for Va=14mm and E=21mm. Which is best?
   2. Even if an antibiotic tests as “S,” why might it NOT be appropriate or not work?

1. Fill in the table below regarding the Mueller-Hinton plate test done for the antibiotic Ampicillin (AM).

|  |  |
| --- | --- |
| Result | What does the plate look like? |
| Sensitive |  |
| Intermediate |  |
| Resistant |  |

1. If *Enterobacter cloacae* had the following zone of inhibition sizes, what antibiotic would you prescribe? Why?

|  |  |
| --- | --- |
| **Antibiotic Name** | **Zone Size (mm)** |
| Erythromycin | 16 |
| Streptomycin | 14 |
| Vancomycin | 12 |
| Bacitracin | 12 |

**Broth Dilution Test (4 Questions)**

1. Fill in the table below regarding broth dilution tests

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Definition | Advantage | Used to determine: | Does Not determine: |
| Broth Dilution |  |  |  |  |

1. Compare and Contrast MIC and MBC.

|  |  |  |
| --- | --- | --- |
|  | Staph | Ecoli |
| MIC Cf |  |  |
| MBC Cf |  |  |
| MIC NB |  |  |
| MBC NB |  |  |
| Which drug most effective? Explain. |  |  |

1. Use the table below to fill out the MIC and MBC for the drugs AM and CIP.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | *Staph* | | *E. coli* | |
| Drug | Dilution | Growth | Subculture | Growth | Subculture |
| AM | 1:2 | - | - | - | - |
| “ | 1:10 | - | + | + | + |
| “ | 1:20 | - | + | + | + |
| “ | 1:100 | + | + | + | + |
| CIP | 1:4 | - | - | - | - |
| “ | 1:60 | - | - | - | - |
| “ | 1:80 | + | + | - | + |

**Antibiotics ( 7 Questions):**

1. Who discovered the first antibiotic?
   1. How was the antibiotic discovered?
   2. What was the first antibiotic?
2. What is selective toxicity?
3. How does this apply to antibiotics?
4. Fill in the table below regarding antibiotic terms.

|  |  |  |
| --- | --- | --- |
| **Term** | **Definition** | **Benefits/Drawbacks** |
| **Narrow-Spectrum** |  |  |
| **Broad Spectrum** |  |  |
| **Synergism** |  |  |

1. Fill out the table below regarding targets of antibiotics.

|  |  |  |  |
| --- | --- | --- | --- |
| **Target** | **How is this structure different from Eukaryotic cells?** | **How does this disrupt bacteria function?** | **What danger is there to Eukaryotic cells?** |
| **Cell Wall** |  |  |  |
| **Folic Acid Synthesis** |  |  |  |
| **Ribosomes** |  |  |  |
| **Outer Membranes** |  |  |  |
| **DNA synthesis**  **/transcription** |  |  |  |

1. What are the best three targets for antibiotics?
   1. Why are these targets best?
2. When may antibiotics that target the outer membrane in bacteria cells be used?
3. Compare and contrast antibiotic diffusion vs disinfectant diffusion plates.

**Drug Resistance ( 3 Questions):**

1. Fill in the table below regarding chemical forms of drug resistance.

|  |  |  |  |
| --- | --- | --- | --- |
| Drug Resistance | | | |
| **Natural Process** | How does it occur? | Examples: | Result |
| Exchange of Plasmids |  | Penicillinase- |  |
| **Human Activities** | | | |
| Incomplete Therapy | How does it occur? | Examples: | Result |
| Inappropriate/Overprescribing of Antibiotics |  |  |  |
| Livestock/Animal Feed |  |  |  |
| Hospitals and Nursing Homes |  |  |  |

**Chemical Methods of Controlling Bacterial Growth ( 4 Questions)**

1. Fill in the table below regarding **chemical** forms of microbial inhibition.

|  |  |
| --- | --- |
| **Substance** | **Uses** |
| **Alcohol** |  |
| **Soap** |  |
| **Halogens (Cl2, I2, Br2 etc)** |  |
| **Substance** | **Uses** |
| **Phenol** |  |
| **Phenolics/Bisphenols** |  |
| **Heavy Metals (Silver Nitrate, Zinc chloride)** |  |

1. Alcohol:
   1. What concentrations are effective against bacteria?
   2. What concentrations are ineffective against bacteria?
2. List the life-forms, in order, from most resistant to least resistant to chemical control.
3. What four factors affect microbial death rate?

**Physical Methods of Microbial Control (10 Questions)**

1. Fill in the table below regarding physical controls to microbial growth.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Type of Physical Control** | **Description**  **(What is it?)** | **What does it kill/prevent?** | **What does it NOT kill?** | **Examples** | **Sterilization**  **(Yes/No)** | **Bactericidal**  **(Yes/No)** |
| **Moist Heat** |  |  |  | **Boiling -**  **Autoclave -** |  |  |
| **Pasteurization** |  |  |  |  |  |  |
| **Dry Heat** |  |  |  | **Flaming-**  **Incineration** |  |  | |
| **Filtration** |  |  |  |  |  |  | |
| **Type of Physical Control** | **Description**  **(What is it?)** | **What does it kill/prevent?** | **What does it NOT kill?** | **Examples** | **Sterilization**  **(Yes/No)** | **Bactericidal**  **(Yes/No)** | |
| **Low Temps** |  |  |  |  |  |  | |
| **Lyophilzation** |  |  |  |  |  |  | |
| **Osmotic Pressure** |  |  |  |  |  |  | |
| **Ionizing Radiation** |  |  |  |  |  |  | |
| **Nonionizing Radiation** |  |  |  |  |  |  | |