

KATHMANDU UNIVERSITY
End Semester Examination [C]
June, 2018

Marks Scored:

Level : B. Tech.

Year : IV

Exam Roll No. :

Time: 30 mins.

Course : BIOT 401

Semester : I

F. M. : 20

Registration No. :

Date JUN 13 2018

SECTION "A"

[10 Q × 1 = 10 marks]

Choose and tick (✓) the most appropriate answer.

- Lipophilic drugs taken up by fat tissue, polar drugs excreted by the kidneys, while cationic drugs are bound to-----.
a. Nucleic acids
b. Plasma proteins
c. Bile duct
d. Blood cells
- Which of the following drugs is better in taking with grape juice?
a. Terfenadine
b. Warfarin
c. Cyclosporine
d. Penicillin
- Introducing a stable methyl group at position-----, in an oral contraceptive, megestrol acetate, its metabolism is blocked and activity of the drug is prolonged
a. 4
b. 6
c. 8
d. 10
- Which of the followings do not fall under the category of self-resistance mechanism in macrolide producer organisms?
a. Action of the Erm methyltransferase
b. Expression of ABC type proteins
c. Enzymatic modification at the end of the biosynthetic pathway
d. Increase the thickness of the cell wall
- β -lactamases cannot hydrolyze the drugs of type -----
a. Aminoglycosides
b. Cephalosporin
c. Carbapenem
d. Penicillin
- Out of the four families of efflux pumps that can function in antibiotic resistance, which one uses the hydrolysis of ATP to provide the energy for active transport of antibiotic out of the cell?
a. First
b. Second
c. Third
d. Fourth
- DNA gyrase is not important for controlling DNA topology in DNA -----
a. Decatenation
b. Transcription
c. Recombination
d. Replication
- Penicillin inactivates the PG cross linking by forming -----isopeptide bond
a. Ala-D-Ala
b. Lys-D-Lys
c. Lys-D-Ala
d. Lys-D-Val

9. The historical scourges of plague is caused by a gram-negative bacteria, -----.
- | | |
|---------------------------|---------------------------|
| a. <i>Yersinia pestis</i> | b. <i>Vibrio cholerae</i> |
| c. <i>Salmonella</i> | d. <i>E. coli</i> , |
10. ----- Strain plays role on Sausage fermentation.
- | | |
|--------------------------------|-----------------------|
| a. <i>Endomyces fibulogera</i> | b. <i>Candida</i> |
| c. <i>S. soyae</i> | d. <i>Aspargillus</i> |

SECTION "B"

[10 Q × 1 = 10 marks]

Fill in the blanks.

1. Compounds which contain more than----- hydrogen bond donating groups are poorly absorbed in GI track.
2. Most successful drugs have a dose size less than ----- and given once or twice a day.
3. Insulin given to diabetic patient can be displaced from the plasma protein by -----that can lead to a insulin overdose, if given together.
4. Modified Vigra is in clinical trial by changing a methyl and propyl group by ethyl groups, the process of which is known as -----
5. Replacing the methyl group of methyl ester with NH₂ forms an ----- functional group which is more stable than original ester.
6. -----is a drug attached to an amino acid or nucleic acid that acts as search and destroy the tumor cells.
7. Lidocaine is more effective than procaine due to its extra ----- group in its structure.
8. The current generation of sulfa drugs is sulfamethoxazole, used in combination with ----- for the treatment patients with urinary tract infections.
9. Conversion of pargylene to propionaldehyde takes place in-----
10. There are three classes of man-made synthetic antibiotics in clinical use: the sulfa drugs introduced in 1930s; the quinolones introduced in 1960s; and an ----- approved in US in 2000.

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Level : B. Tech.
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Time : 2 hrs. 30 mins.

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Semester : I
F. M. : 55

SECTION "C"

[6Q × 5 = 30 marks]

Attempt *ANY SIX* questions.

1. a) What are the three possibilities of providing a drug in target cell by cross the cell membrane that are very polar or ionic? [1.5]
b) What is pinocytosis? How does the Abs1-Abs2 pair of proteins have regulatory system works in *S. coelicolor*? [0.5+3=3.5]
2. a) How does resistance develop in bacteria? What are the major target sites of antibiotics in bacterial cells? [1+2=3]
b) What are aminoglycosides? How they function? [1+1=2]
3. a) Describe the similarities and differences between gram-negative and gram-positive cell wall structure of a bacteria with proper diagram [3]
b) How does *Erwinia carotovora* uses quorum sensing molecules for its protection? [2]
4. What is Trojan horse approach? State the effect of Bioisosteres and Stereo electronic modifications in a drug [2.5+2.5=5]
5. a) Explain the mechanism of killing a bacterium by penicillin antibiotic [3]
b) Sketch the mechanism of action of Quinolone anti bacterials [2]
6. What are the importances of Prodrugs to improve solubility in water? How the side effect of diazepam is overcome? [2.5+2.5=5]
7. How the efflux pumps in Tetracycline production is regulated? Explain the antibiotic pathway-specific regulation in *Streptomyces* by butaneolides? [2.5+2.5=5]
8. Define solid state fermentation. Explain the various types of fermenter designs used for solid state fermentation? [1+4=5]

SECTION "D"

Attempt *ANY FOUR* questions. **Question No. 13 is compulsory.**

9. Explain the functioning of Sulfa-drugs in folic acid metabolism indicating their involved steps in detail. [6]
10. Describe the strategies for self-resistance in macrolide producers and presage acquired resistance mechanism in human pathogens. [3 × 2 = 6]
11. Explain the six major characteristics of a prodrug with specific example. [6]
12. What are the sequential patterns of lactic acid bacteria in Sauerkraut fermentation? [6]
13. Write short notes on [3.5 × 2 = 7]
 - a. Aminoglycoside modifying enzymes
 - b. Esters as prodrugs

