Part I. (75 Points)
There are 50 multiple choice questions worth 1.5 points each (75 Points).
Please use the Scantron Sheet provided. If you feel there is no correct answers, leave the Scanron blank for that particular question and write NONE on your exam for that question.

1. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>is very effective against anerobic bacteria.</td>
<td>binds to the 50S ribosomal subparticle.</td>
<td>is primarily used against Gram (-) bacteria.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III

Answer ___

2. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>is a prodrug.</td>
<td>inhibits dihydrofolate reductase in protozoa.</td>
<td>is a component of <strong>Malarone®</strong>.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III

Answer ___

3. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>acts as a mimic of guanosine.</td>
<td>is used to treat hepatitis B infection.</td>
<td>does not require viral thymidine kinase or any other kinase for activation.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III

Answer ___
4. The drug illustrated below:

I is orally active.
II inhibits bacterial cell wall synthesis by inhibiting penicillin binding protein (a transpeptidase).
III is β-lactamase resistant.

a. I only
b. III only
c. I and II only
d. II and III only
e. I, II, and III

Answer ____

5. The drug illustrated below:

I is used as a systemic antifungal agent.
II is an enzyme inhibitor.
III prevents the integration of viral genetic material into human chromosomes

a. I only
b. III only
c. I and II only
d. II and III only
e. I, II, and III

Answer ____

6. The drug illustrated below:

I is a prodrug.
II is used as a systemic antibiotic.
III has a long duration of action making it useful in the treatment of protozoal infections.

a. I only
b. III only
c. I and II only
d. II and III only
e. I, II, and III

Answer ____

7. The drug illustrated below:

I is dependent upon viral thymidine kinase for its ultimate activity.
II is a cascading prodrug.
III is indicated for the use in the treatment of either HIV or HBV infections.

a. I only
b. III only
c. I and II only
d. II and III only
e. I, II, and III

Answer ____
8. The drug illustrated below:

| Kaletra® in addition to Lopinavir contains | I Emtricitabine (200 mg).  
| II Abacavir (300 mg).  
| III Ritonavir (50 mg). |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer:  

9. The drug illustrated below:

| I inhibits squalene epoxidase.  
| II can be used iv for systemic fungal infection.  
| III inhibits 14α-demethylase. |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer:  

10. The drug illustrated below:

| I is classified as a nucleoside reverse transcriptase inhibitor.  
| II does cause chain termination of developing viral DNA.  
| III is used in combination with the 2’-deoxyadenylic acid mimic, tenofovir |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer:  

11. The drug illustrated below:

| I has weak antibacterial activity.  
| II is administered with cliastin to prevent deactivation by renal dehydropeptidase.  
| III is not administered orally. |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer:  

12. The drug illustrated below:

| Concerning the Relenza Inhaler- |
| I it uses a cartridge with six individual blister packs.  
| II each blister pack must be individually punctured by the device.  
| III typical dosage involves the use of two blister packs. |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer:  

13. The drug illustrated below:

![Chemical Structure](image1)

I degradation products found in expired lots of this drug could increase the likelihood of a serious allergenic response.

II is orally active.

III is sensitive to β-lactamase.

(a) I only  
(b) III only  
(c) I and II only  
(d) II and III only  
(e) I, II, and III  

Answer ____

14. The drug illustrated below:

![Chemical Structure](image2)

I is classified as a non-nucleoside reverse transcriptase inhibitor.

II is effective orally.

III is among the first-line drugs used to prevent malarial infection in areas where the malaria has proved to be chloroquine-resistant.

(a) I only  
(b) III only  
(c) I and II only  
(d) II and III only  
(e) I, II, and III  

Answer ____

15. The drug illustrated below:

![Chemical Structure](image3)

I binds to the 50S subunit of ribosomal RNA of bacteria disrupting protein synthesis.

II can undergo internal ketalization under acid conditions.

III must be enteric coated for oral administration.

(a) I only  
(b) III only  
(c) I and II only  
(d) II and III only  
(e) I, II, and III  

Answer ____

16. The drug illustrated below:

![Chemical Structure](image4)

I is a 2’deoxyadenosine mimic.

II acts primarily as a nucleoside reverse transcriptase inhibitor.

III is a prodrug.

(a) I only  
(b) III only  
(c) I and II only  
(d) II and III only  
(e) I, II, and III  

Answer ____
17. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I is a carbapenem antibiotic.</th>
<th>II is effective orally.</th>
<th>III is an inhibitor of β-lactamase.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image1" alt="Drug Structure" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

**Answer**

18. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I inhibits squalene epoxidase in the synthesis of ergosterol in fungi.</th>
<th>II cannot be used orally.</th>
<th>III is used as a prophylactic for malarial infection.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image2" alt="Drug Structure" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

**Answer**

19. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I has a long duration of action that allows once a day dosing.</th>
<th>II is a non-nucleoside reverse transcriptase inhibitor.</th>
<th>III is susceptible to the development of resistance when used as monotherapy.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image3" alt="Drug Structure" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

**Answer**

20. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I is a third generation cephalosporin</th>
<th>II is β-lactamase resistant.</th>
<th>III is effective orally.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><img src="image4" alt="Drug Structure" /></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

**Answer**
21. The drug illustrated below:

I is effective orally.
II can be administered iv.
III inhibits β-lactamase.

a I only
b III only
c I and II only
d II and III only
e I, II, and III  

Answer ______

22. The drug illustrated below:

I is used to treat severe acute hepatitis B infections.
II is activated to its 5'-triphosphate.
III inhibits viral reverse transcriptase.

a I only
b III only
c I and II only
d II and III only
e I, II, and III  

Answer ______

23. The drug illustrated below:

I is a prodrug.
II is resistant to β-lactamase
III is more active than ampicillin to Gram (-) bacteria such as *Pseudomonas aeruginosa*.

a I only
b III only
c I and II only
d II and III only
e I, II, and III  

Answer ______

24. The drug illustrated below:

I blocks protein synthesis by interaction with ribosomal RNA in bacteria.
II should not be taken together with calcium antacids.
III can cause double-strand breaks in bacteria DNA.

a I only
b III only
c I and II only
d II and III only
e I, II, and III  

Answer ______
25. The drug illustrated below:

I has resistance to β-lactamase.
II is used against Gram (-) bacteria.
III is commonly associated with cross-allergenicity to penicillins.

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III

Answer ____

26. The drug illustrated below:

I is used to treat hepatitis B.
II could be cross allergenic in individuals allergic to sulfonamide antibiotics.
III is used to treat individuals with HIV infection.

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III

Answer ____

27. The drug illustrated below:

I is a potent broad spectrum antibiotic that can kill gram (-) bacteria.
II is not orally effective and must be administered parenterally.
III is resistant to renal dehydropeptidase.

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III

Answer ____

28. The drug illustrated below:

I lacks the cross resistance observed with several nucleoside reverse transcriptase inhibitors (NRTIs).
II is a noncompetitive inhibitor of viral reverse transcriptase.
III requires viral thymidine kinase for activity.

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III

Answer ____
29. The drug illustrated below:

<table>
<thead>
<tr>
<th></th>
<th>I is converted to a mimic of guanosine.</th>
<th>II is indicated for the treatment of HIV infection.</th>
<th>III is used to treat hepatitis B.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a I only</td>
<td>b III only</td>
<td>c I and II only</td>
</tr>
<tr>
<td></td>
<td>d II and III only</td>
<td>e I, II, and III</td>
<td><strong>Answer</strong></td>
</tr>
</tbody>
</table>

30. The drug illustrated below:

| I binds to the D-ala-D-ala terminus of peptidoglycans in bacteria, blocking access by transferases. | II is used in the treatment of MRSA infections. | III is not absorbed when administered orally. |
|---|--------------------------------------------------|-------------------------------------------------|----------------------------------|
| a I only                               | b III only                                        | c I and II only                  |
| d II and III only                      | e I, II, and III                                  | **Answer**                       |

31. The drug illustrated below:

<table>
<thead>
<tr>
<th>I is administered orally.</th>
<th>II blocks the ability of a viral enzyme to modify viral proteins.</th>
<th>III acts as a “transition state” enzyme inhibitor.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a I only</td>
<td>b III only</td>
<td>c I and II only</td>
</tr>
<tr>
<td>d II and III only</td>
<td>e I, II, and III</td>
<td><strong>Answer</strong></td>
</tr>
</tbody>
</table>
32. For the combination drug listed below, which of the following are among its components?

<table>
<thead>
<tr>
<th>Trizivir®</th>
<th>I</th>
<th>Zidovudine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>II</td>
<td>Abacavir</td>
</tr>
<tr>
<td></td>
<td>III</td>
<td>Lamivudine</td>
</tr>
</tbody>
</table>

a. I only  
b. III only  
c. I and II only  
d. II and III only  
e. I, II, and III  

Answer _____

33. The drug illustrated below:

\[
\begin{array}{c}
\text{I} \\
\text{II} \\
\text{III}
\end{array}
\]

\[\text{I inhibits viral DNA polymerase.}\]
\[\text{II is administered only as a parenteral.}\]
\[\text{III can form a chelate with calcium.}\]

a. I only  
b. III only  
c. I and II only  
d. II and III only  
e. I, II, and III  

Answer _____

34.

**Concerning β-Lactamase**

| I  | There are essentially negligible differences between β-lactamases. |
| II | All β-lactamases are inhibited by clavulanic acid. |
| III| β-lactamases have been classified into between 4-6 distinct groups or classifications. |

a. I only  
b. III only  
c. I and II only  
d. II and III only  
e. I, II, and III  

Answer _____

35. The drug illustrated below:

| I  | is a HIV protease inhibitor. |
| II | is a peptidomimetic without any carboxamide bonds. |
| III| has two chiral centers. |

a. I only  
b. III only  
c. I and II only  
d. II and III only  
e. I, II, and III  

Answer _____

36. The drug illustrated below:

| I  | is used as a prophylactic treatment to prevent malarial infection. |
| II | is used orally, but is not used in combination with other drugs. |
| III| inhibits mycobacterial arabinosyl transferases. |

a. I only  
b. III only  
c. I and II only  
d. II and III only  
e. I, II, and III  

Answer _____
37. The drug illustrated below:

| I | is NOT orally active. |
|-------------------------------------------|
| II | is NOT resistant to β-lactamase. |
| III | has an extended spectrum of antibacterial activity that includes Gram (-) bacteria. |

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

38. Antifungal drugs that do not affect membrane ergosterol include

<table>
<thead>
<tr>
<th>I</th>
<th>Griseofulvin</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>Flucytosine</td>
</tr>
<tr>
<td>III</td>
<td>Fluconazole</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

39. The drug illustrated below:

| I | is orally efficacious for treating fungal infections within the lumen of the GI tract, but not orally efficacious for systemic fungal infections. |
|-------------------------------------------|
| II | is often nephrotoxic upon prolonged parenteral administration. |
| III | binds with cholesterol to increase the permeability of fungal cells. |

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

40. The drug illustrated below:

| I | inhibits the synthesis of mycolic acids. |
|-------------------------------------------|
| II | prevents the formation of essential components of the mycobacterial cell wall. |
| III | must be administered by injection. |

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____
41. The drug illustrated below is:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>binds to 30S subunit of ribosomes and blocks protein synthesis.</td>
</tr>
<tr>
<td>II</td>
<td>known to induce cytochrome P450 enzymes, such as CYP450 3A4.</td>
</tr>
<tr>
<td>III</td>
<td>binds to bacterial DNA dependent RNA polymerase.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

42. The drug illustrated below:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>is used as an antiretroviral agent.</td>
</tr>
<tr>
<td>II</td>
<td>is effective orally.</td>
</tr>
<tr>
<td>III</td>
<td>used in the prophylaxis and treatment of illness associated with influenza A or B infection.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

43. The drug illustrated below:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>is used in combination with nucleoside reverse transcriptase inhibitors that mimic thymidine or 2’-deoxycytosine.</td>
</tr>
<tr>
<td>II</td>
<td>is a component of Epzicom®</td>
</tr>
<tr>
<td>III</td>
<td>does not cause chain termination after incorporation into viral DNA.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____

44. The drug illustrated below:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>can be administered orally.</td>
</tr>
<tr>
<td>II</td>
<td>is β-lactamase resistant.</td>
</tr>
<tr>
<td>III</td>
<td>is among the more effective cephalosporins against Gram (-) bacteria.</td>
</tr>
</tbody>
</table>

a) I only  
b) III only  
c) I and II only  
d) II and III only  
e) I, II, and III  

Answer ____
45. The drug listed below:

- **I** binds to gp41, a viral transmembrane protein of HIV-1, preventing cellular infection.
- **II** blocks the chemokine receptor CCR5 which HIV uses to bind and gain entry to human T cells.
- **III** can be administered orally.

   a. I only
   b. III only
   c. I and II only
   d. II and III only
   e. I, II, and III  
   Answer _____

46. The drug illustrated below:

- **I** is β-lactamase resistant.
- **II** is a bacterial protein synthesis inhibitor.
- **III** is associated with decreases in erythrocytes, hemoglobin, and aplastic anemia.

   a. I only
   b. III only
   c. I and II only
   d. II and III only
   e. I, II, and III  
   Answer _____

47. The drug illustrated below:

- **I** has been used for post-exposure treatment to aerosolized Bacillus anthracis (anthrax).
- **II** should not be taken with antacids, milk, or iron supplements.
- **III** is associated with increased risk of tendinitis and tendon rupture.

   a. I only
   b. III only
   c. I and II only
   d. II and III only
   e. I, II, and III  
   Answer _____

48. The drug illustrated below is:

- **I** is a prodrug that permits high oral bioavailability.
- **II** is used to treat genital herpes.
- **III** is an effective inhibitor of viral reverse transcriptase.

   a. I only
   b. III only
   c. I and II only
   d. II and III only
   e. I, II, and III  
   Answer _____
49. The drug illustrated below:

| I | can cause phototoxicity (photosensitization) as a side effect. |
| II | can be administered intravenously. |
| III | is commonly administered by intramuscular injection. |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer _____

50. The drug illustrated below:

| I | is a prodrug that is specifically designed for intravenous administration. |
| II | binds to the 50S ribosomal subunit of bacterial ribosomes. |
| III | is known to discolor bone and teeth in young children. |

- a I only
- b III only
- c I and II only
- d II and III only
- e I, II, and III  

Answer _____

Part 2  Generic Names (9 Points).  Provide the Generic Names for the Compounds Illustrated on the following page.  In the space provided under the structure of each the compounds illustrated, write the correct CAPITALIZED letter corresponding to the choice of answers below.  The letter “Z” may be used as an answer as seldom or as often as needed.

A. Sulfisoxazole  
B. Tobramycin  
C. Didanosine  
D. Levofoxacin  
E. Pyrimethamine  
F. Famciclovir  
G. Streptomycin  
H. Oseltamivir  
I. Erythromycin  
J. Doxycycline  
K. Sulfamethizole  
L. Voriconazole  
M. Stavudine  
N. Meropenem  
O. Metronidazole  
P. Entecavir  
Q. Ribavirin  
R. Dicloxacillin  
S. Clarithromycin  
T. Rifampin  
U. Miconazole  
V. Cefazolin  
W. Itraconazole  
X. Trimethoprim  
Y. Cefadroxil  
Z. None of These
<table>
<thead>
<tr>
<th>Answer</th>
<th>Answer</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image10.png" alt="Image" /></td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image13.png" alt="Image" /></td>
<td><img src="image14.png" alt="Image" /></td>
<td><img src="image15.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image16.png" alt="Image" /></td>
<td><img src="image17.png" alt="Image" /></td>
<td><img src="image18.png" alt="Image" /></td>
</tr>
<tr>
<td><img src="image19.png" alt="Image" /></td>
<td><img src="image20.png" alt="Image" /></td>
<td><img src="image21.png" alt="Image" /></td>
</tr>
</tbody>
</table>
Part 3 Nomenclature 16 Points.

1. 4-[(2-Chloro-6-(1-hydroxypropyl)-4-methyl-1-azabicyclo[3.2.0]hept-2-en-3-yl)methylthio]pyrrolidine-2-carboxamide, 4S-[4α,5β,6β(S*)]

2. 3H-1,2,4-Triazol-3-one, 4-[4-(1H-1,2,4-triazol-1-ylmethyl)phenyl]-2,4-dihydro-2-(1-methylpropyl)-

3. 2H-Purine-2-one, 6-amino-3,9-dihydro-9-[[2-hydroxy-1(hydroxymethyl)ethoxy]methyl]-

4. 1,4-Pentanediamine, N⁴-(7-trifluoromethyl-3-quinolinyl)-N¹,N¹-diethyl, hydrochloride