

KATHMANDU UNIVERSITY  
End Semester Examination  
February/March, 2018

Marks Scored:

Level : B. Tech.

Course : BIOT 401

Year : IV

Semester : I

Exam Roll No. :

Time : 30 mins.

F. M. : 20

Registration No. :

Date FEB. 27 2018

SECTION "A"

[16Q × 0.75 = 12 marks]

Choose and tick ( ✓ ) the most appropriate answer.

1. Penicillin inactivate the PG cross linking by forming -----isopeptide bond  
a. Ala-D-Ala      b. Lys-D-Lys      c. Lys-D-Ala      d. Lys-D-Val
2. -----is more selective for DNA gyrase (topo II) blockade than topo IV in bacterial cell system.  
a. Norfloxacin      b. Ciprofloxacin      c. Levofloxacin      d. Nadifloxacin
3. Tylosin, a -----member macrolide, targets the 23S rRNA at essentially the same site as erythromycin.  
a. 16      b. 19      c. 12      d. 18
4.  $\beta$ -lactamases is an enzyme that -----  $\beta$ -lactam ring in penicillin classes of antibiotics.  
a. Activates      b. Dehydrates      c. Hydrolyzes      d. Ring expands
5. The activity of megestrol acetate (oral contraceptive) is prolonged by introducing methyl group in position -----.  
a. Two      b. Four      c. Six      d. Ten
6. The small subunit (30S) of ribosome contains about 20 proteins and ----- ribosomal rRNA of about 1,500 ribonucleotides.  
a. 16S      b. 23S      c. 25S      d. 5S
7. Oxytetracycline are generated from the bacteria -----.  
a. *S. aureofaciens*      b. *S. rimosus*      c. *S. erythraea*      d. *S. aureus*
8. -----is used to minimize the tissue damage and pain on injection of Insulin.  
a. Phenol      b. Glycerol      c. NaCl      d. Physiologic buffer
9. Which yeast strain plays role on Sausage fermentation.  
a. *S. soyae*      b. *Candida*  
c. *Endomyces fibulojera*      d. *Aspargillus*
10. Sauerkarut fermentation is initiated by the following LAB  
a. Heterofermentative      b. Homofermentative  
c. Thermophilic      d. Osmophilic

11. Serious toxic effects can arise if the antihistamine agent ----- is taken with grapefruit juice.  
a. Terfenadine      b. cyclosporin      c. dihydropyridine      d. fexofenadine
12. Lipophilic drugs taken up by fat tissue, polar drugs excreted by the kidneys, anionic drugs bound to plasma proteins and cationic drugs are bound to-----  
a. Plasma proteins      b. Nucleic acids      c. Amino acids      d. Blood vessels
13. Sulfamethoxazole, used in combination with -----for the treatment patients with urinary tract infections.  
a. Penicillin      b. Cephalosporin      c. Trimethoprim      d. Gentamicin
14. Bacterial cell wall biosynthesis is inhibited by ----- class of antibiotics.  
a. Aminoglycosides      b. ciprofloxacin      c. trimethoprim      d. vancomycin
15. Which of the followings is not a synthetic antibiotic?  
a. ciprofloxacin      b. Sulfamethoxazole      c. Trimethoprim      d. Tetracycline
16. -----has been approved by FDA for killing *Bacillus anthracis* in anthrax infections.  
a. Amikacin      b. Piperacillin      c. Ciprofloxacin      d. Gentamicin

SECTION "B"

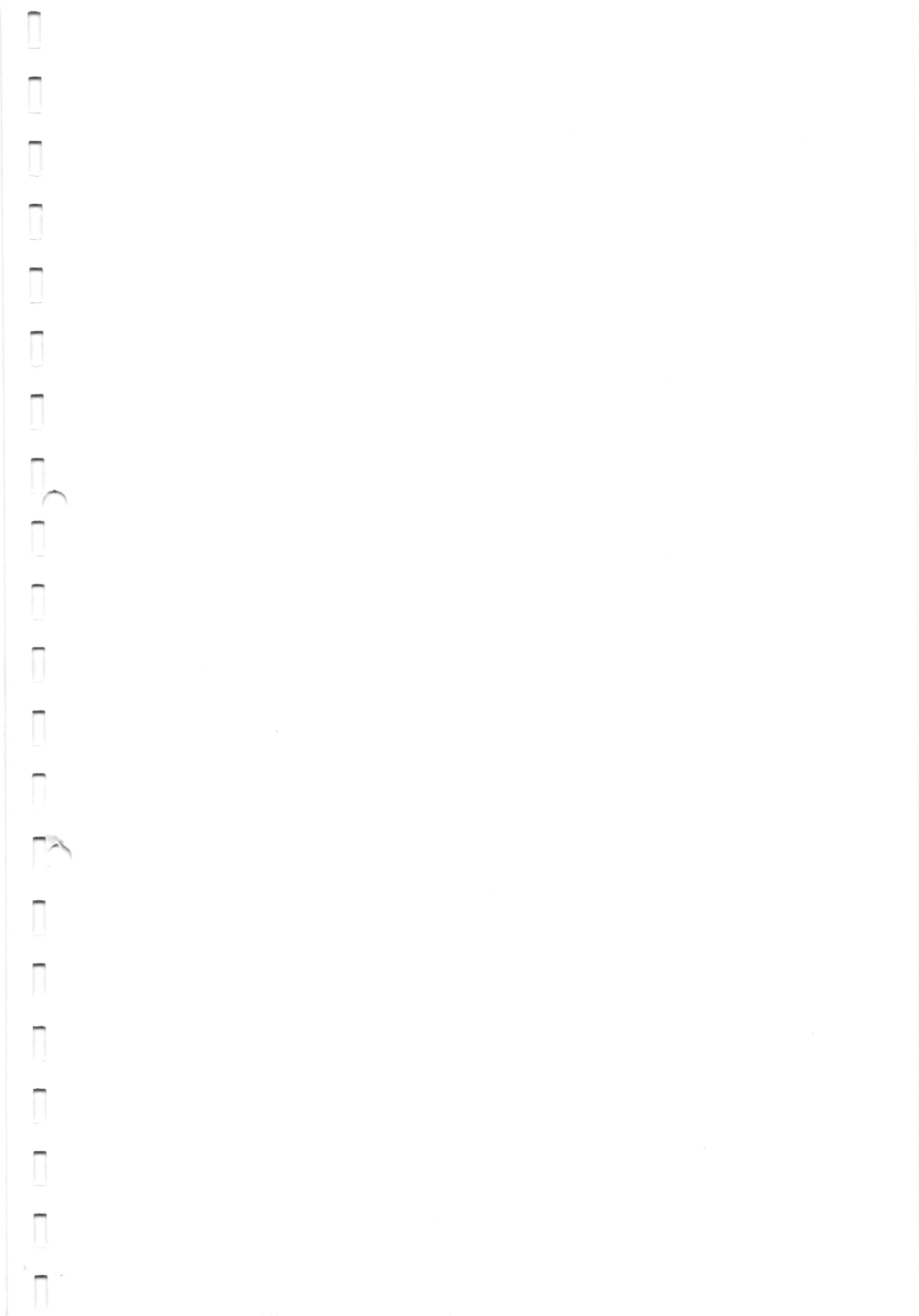
[16 Q. × 0.5 = 8 marks]

Fill in the blanks.

17. Penicillins are converted enzymatically to the -----by a ring expandase enzyme.
18. Expression of the macrolide exporting transport proteins, powered by ATP hydrolysis is known as -----protein.
19. Aminoglycosides, also called -----, has been widely used for decades in many clinical settings for antibacterial infections.
20. Penicillin is the secondary metabolite of the fungus named -----
21. The -----enzyme is transpeptidase acting in periplasmic space with specificity for the precursors of cell surface proteins of gram-positive bacteria.
22. -----is the ability of an organism to synthesize a particular organic compound required for its growth.
23. Lidocaine is more effective than procaine due to its extra ----- group in its structure.
24. Salt concentration of -----% is favourable to the growth of *Leuconostoc mesenteriodes* and *L. brevis*

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25. -----is the competitive inhibitors of PABA in the dihydropteroate synthase.
26. The molecules that most likely serve as equivalent quorum sensors in gram-positive *streptomyces* bacteria are -----
27. Besides exoenzyme production, *Erwinia* also use the same signaling mechanism to coordinately up-regulate the genes for -----biosynthesis.
28. -----are the therapeutic pair recently approved as synergist.
29. ----- fermentation is primarily used in the extraction of secondary metabolites that need to be used in liquid form.
30. -----is an example of diazepam prodrug which avoids the drowsiness side-effects associated with diazepam.
31. The PG with orthogonal glycan strand undergoes enzymatic cross linking of the glycan strands by -----action.
32. Conversion of pargylene to propionaldehyde takes place in-----



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Semester : I  
F. M. : 55

SECTION "C"

[6Q × 5 = 30 marks]

Attempt *ANY SIX* questions.

1. a. What are the points to be considered in designing a prodrug? [2]  
b. What is self-destruct drug? Why it is independent on metabolic enzyme of a patient? [3]
2. a. How do "search and destroy" drug helps to kill targeting tumor cells? [2]  
b. Penicillin is given via injection and not orally, why? [3]
3. a. Describe the functioning of Hexamine to treat urinary tract infection [3]  
b. How does *Erwinia carotovora* uses quorum sensing molecules for its protection? [2]
4. How do antibiotic producers escape of their own destruction? [5]
5. What is pinocytosis? Show the mechanism of pinocytosis. [3+2=5]
6. What is the difference between Salicylic acid and Aspirin as pain killer drug? Why Aspirin and Insulin is not taken together? [2+3=5]
7. What are Aminoglycoside antibiotics? How they are used to treat against enterococcal infections? [3+2=5]
8. How is sauerkraut produced? Which microbes are involved in the sauerkraut fermentation? [2+3=5]

SECTION "D"

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

9. Where is the target of Coumermycin in bacterial cell system? Explain the mechanism of action of quinolone antibacterials [6]
10. What are  $\beta$ -lactam antibiotics? Describe the PG cross-linking inactivation mechanism of Penicillin [2+4=6]
11. What are the strategies to identify novel antibiotics looking to the old targets? Explain with examples. [6]
12. List out the steps involved in making wine. Explain each step in brief. [6]
13. write short notes on [3.5 × 2=7]
  - a. Prodrugs of prodrug
  - b. Butaneolide signaling molecules

