KATHMANDU UNIVERSITY
End Semester Examination[C]
May/June, 2019

Marks Scored:

Level : B. Tech.
Year : IV
Course : BIOT 401
Semester: I

Exam Roll No. :
Time: 30 mins.
F. M. : 20

Registration No.:
Date 02 JUN 2019

SECTION "A"
[20Q. × 0.5 = 10 marks]

Choose the most appropriate answer:

1. Aminoglycosides are targeted to disrupt the functioning of _____
   a. 50S subunit b. 30S subunit c. mRNA d. tRNA

2. Tylosin, a _____macrolide, targets the 23S rRNA at essentially the same site as erythromycin.
   a. 16-membered b. 19-membered c. 12-membered d. 18-membered

3. β-lactamases is an enzyme that _____ β-lactam ring in penicillin classes of antibiotics.
   a. Activates b. Dehydrates c. Hydrolyzes d. Ring expands

4. Which one of the glycopeptide antibiotics in the vancomycin family have been approved for human clinical use?
   a. Teicoplanin b. spectinomycin c. tetracycline d. erythromycin

5. 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

6. Which of the followings is not an aminoglycoside?
   a. Tobramycin b. Gentamycin c. Amikacin d. Vancomycin

7. Conversion of Azathioprine to 6-mercaptopurine is due to the presence of _____ group
   a. Halogen b. –OH c. $-NO_2$ d. $-SO_2$

8. _____ is more selective for DNA gyrase (topo II) blockade than topo IV in bacterial cell system.
   a. Norfloxacin b. Ciprofloxacin c. Levofloxacin d. Nadifloxacin

9. The process used for avoiding catabolite repression during substrate conversion is
   a. Chemostat b. Plug flow c. Batch d. Fed batch

10. During isolation of industrial microbes, which of the following does not have selective advantage?
    a. Antibiotic b. Amylase c. Organic acids d. Cellulase

11. Warafin is an _____ drug.
a. Anti-ulcer b. Antihistamine c. Anticoagulant d. Anti-diabetic

12. Which is not the property of wine yeast
a. Osmotolerance b. Thermo tolerance
c. SO_2 Tolerance d. Fast sedimentation

13. Palmitate ester is used as prodrug of chloramphenicol to avoid _____
a. Drowsiness b. Toxicity c. Bitter taste d. Solubility

14. Typical elemental formula of industrial microbial cells is approximately _____
a. $C_5H_{14}O_2N$ b. $C_3H_4O_2N$ c. $C_2H_7O_2N$ d. $C_6H_7O_2N$

15. Cyclophosphamide is a successful _____ which can be taken orally without causing damage to the gut wall.
a. Anti-ulcer b. Anti-fungal c. Antidepressant d. Anticancer drug

16. Famvir is metabolized to penciclovir in _____
a. Urine b. Liver c. Kidney d. Blood

17. Levodopa is converted to Dopamine in brain cells due to the effect of _____ enzyme.
a. Esterase b. Decarboxylase c. Transferase d. Reductase

18. Valium is a prodrug of _____
a. Dopamine b. Azathioprine c. Nordazepam d. Fluphenazine

19. By _____ the polarity of a drug used in PNS, the side effect in CNS can be reduced.
a. Increasing b. Equilibrating c. Decreasing d. Removing

20. Sauerkarut fermentation is initiated by the following LAB _____
a. Heterofermentative b. Homofermentative
c. Thermophilic d. Osmophilic

SECTION "B"

[20Q. × 0.5 = 10 marks]

Fill in the blanks.

21. Rifampin, a natural product of the ansamycin antibiotic class, isolated originally from actinomycetes named _____

22. Oxytetracycline are generated from the bacteria _____

23. Aminoglycosides, also called _____, has been widely used for decades in many clinical settings for antibacterial infections.

24. Salicyclic acid causes gastric bleeding because of the presence of free _____ _____ group.

25. The molecules that most likely serve as equivalent quorum sensors in gram-positive *streptomycete* bacteria are _____

26. _____ is given intravenously as prodrug of candoxatrials since it's too polar to be absorbed from GI tract.

27. UK 143220 and UK 157147 were developed from cromakalim to enhance _____ _____ in the blood supply.

28. Carbidopa is a drug used to antagonize _____ that converts L-dopa to dopamine.

29. Pargylene is the prodrug of _____

30. _____is an example of self-destruct drug.

31. Cephalosporins is the secondary metabolite of the fungus named _____

32. Phenelzine _____the metabolism of amines and should not be taken with the drugs such as pethidine.

33. The seed mash produced during sake production is called _____.

34. Methyl group on aromatic rings are often oxidized to _____

35. The standard Lactic acid percentage in saukraut is _____.

36. Urethane as functional group is an _____ of methyl group in methyl ester.

37. Fermentation carried out in low water activity is called _____

38. During soya sauce fermentation the optimum temperature for protease production is _____.

39. Expression of the macrolide exporting transport proteins, powered by ATP hydrolysis is known as _____ protein.

40. _____ is the competitive inhibitors of PABA in the dihydropteroate synthase.

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SECTION "C"
[6Q × 5 = 30 marks]

Attempt *ANY SIX* questions:

1. What are Quorum sensing molecules? Why Aspirin and Insulin is not taken together? [3+2=5]
2. Penicillin is given via injection and not orally, why? How do you defend that it is serious to take terfenadine with grapefruit juice? [2+3=5]
3. When do microbes make antibiotics and how do they manage self-protection? How do you define atracurium as self-destruct drug? [2.5+2.5=5]
4. What are prodrugs? Describe the functioning of Hexamine to treat urinary tract infection. [1+4=5]
5. How is Mana Starter produced traditionally in Nepal? [5]
6. Why Pargylene and Aspirin are used as prodrug against their respective drugs? How they help to overcome the problems? [2.5+2.5=5]
7. Describe the sequential pattern of lactic acid bacteria in Sauerkraut fermentation? [5]
8. What is pinocytosis? Describe the functioning of porphyrin in treatment of cancer. [2+3=5]

SECTION "D"
[25 marks]

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

9. How is vitamin B_{12} produced in Tempeh fermentation? [6]
10. How do the two component system of regulation in antibiotic production functions in *S. coelicolor*. Explain. [6]
11. Explain the underlying principle and application of biotechnology in Soysauce manufacturing. [6]
12. What is PABA? Show the mechanism of sulfa drugs in folic acid metabolism. [2+4=6]
13. Write short notes on: [2 × 3.5=7]
    a. β-lactamases
    b. quinolone antibacterials