

M.Sc. CHEMISTRY
FOURTH SEMESTER
MEDICINAL CHEMISTRY
MSC - 402A
[USE OMR FOR OBJECTIVE PART]

**SET
A**

Duration: 3 hrs.

Full Marks: 70

(Objective)

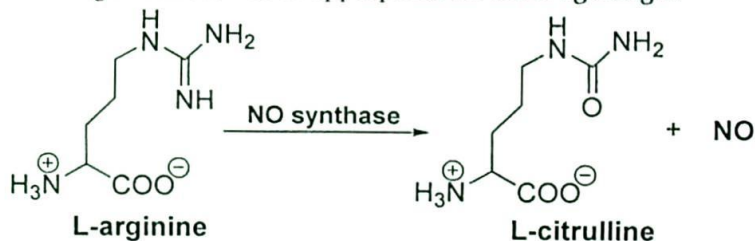
Time: 30 min.

Marks: 20

Choose the correct answer from the following:

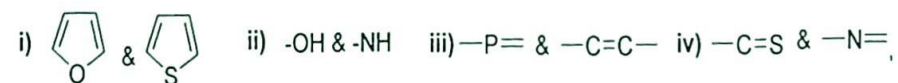
1X20=20

- Potency of a drug expressed in terms of its concentration as
 - 1/C
 - Log1/C
 - logC
 - logC²
- Potency of a drug is found to increase when -Cl group is replaced by -Me in p-position in phenyl moiety of the lead compound of a drug. Which of the following group is likely to increase the potency further when the -Me group is displaced with?
 - Cl in 3-position
 - NMe₂
 - CF₃
 - Bu
- Nitric oxide synthase Catalyses the conversion of L-arginine to L-citrulline and nitric oxide. If you want to interfere with the production of NO, which of the following statement will be appropriate for the drug design?



- The drug has to bind with NO-synthase.
The drug should act as a competitive inhibitor to NO-synthase.
 - The drug need to be structurally similar to L-arginine
- All statements are correct.
 - Drug metabolism
 - Drug absorption
 - Drug excretion

5. Look for the pair which are isosters:

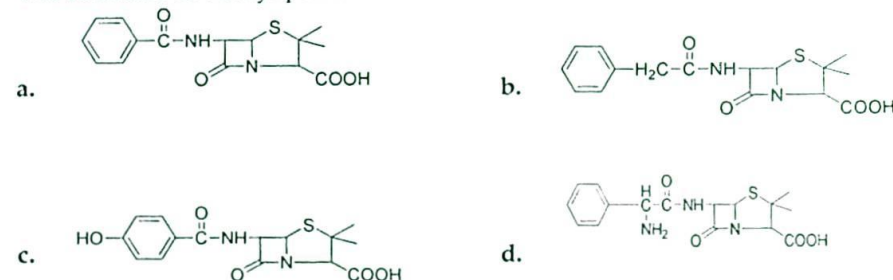


- a. ii & iii
b. i & ii
c. iii & iv
d. ii only

6. The process which occurs in the nucleus using DNA as a template to produce mRNA is called

- a. Translation
b. Transcription
c. Replication
d. None of the above

7. The structure of benzyl penicillin is



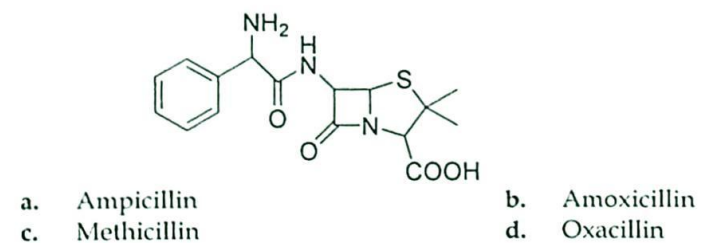
8. The treatment of penicillin with methanol results in the formation of

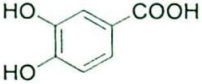
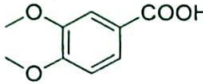
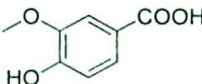
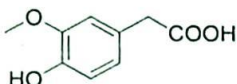
- a. Penicillamine
b. Methyl penicillate
c. Methyl penicilloate
d. Penilloaldehyde

9. Crosslinking of peptidoglycan chain is catalyzed by the enzyme

- a. Hydrolases
b. Amidases
c. Transpeptidases
d. Oxidase

10. The name of the following antibiotic is



11. Which of the following does not have hepatotoxicity?
- Enflurane
 - Isoflurane
 - Halothane
 - Cyclopropane
12. Nephrotoxicity refers to the damages in
- Heart
 - Eye
 - Kidney
 - Liver
13. Dopamine is a monoamine neurotransmitter; its biosynthesis occurs from
- L-Tryptophan
 - L-Tyrosine
 - L-Glycine
 - L-Leucine
14. Drugs acting as selective serotonin reuptake inhibitors (SSRI) are
- Anaesthetics
 - Anti-depressants
 - Cardiovascular
 - Anti-neoplastic
15. Monoamine neurotransmitter, Dopamine is metabolized to
- 
 - 
 - 
 - 
16. NSAID work by blocking the production of
- Bacteria
 - Prostaglandins
 - Bile acids
 - Viruses
17. Ibuprofen is derived from
- 2-methylbutanoic acid
 - Propionic acid
 - 2-methylhexanoic acid
 - Ethanoic acid
18. Dapsone is used for
- the treatment of leprosy
 - the treatment of cancer
 - the treatment of cardiovascular disease
 - the treatment of tuberculosis
19. Isoniazid contains
- a benzene ring
 - a pyrrole ring
 - a pyridine ring
 - an oxadiazole ring
20. Melphalan is mainly used for the treatment of
- acute gout
 - prostatic cancer
 - leukemia
 - multiple myelomas

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(Descriptive)

Time : 2 hrs. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. a. Give a short account of drug absorption. 2
b. Discuss the Structure Activity Relationship (SAR) of streptomycin. 3
c. Write the product of the following reaction. 2
d. What type of drug Diazepam is? Describe its synthetic procedure. 3

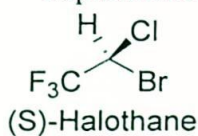
2. Why lipophilic character of a drug is important to determine for lead compound. Why n-octanol is chosen as the standard to determine the lipophilic character of any drug? Express the mathematical relation between lipophilic character and the efficiency of a drug? Illustrate. 3+2+5=10

3. a. What are broad spectrum antibiotics? Give examples. 2
b. Explain the mechanism of action of penicillin. 3
c. What is mRNA and tRNA? Discuss their role in protein biosynthesis. 5

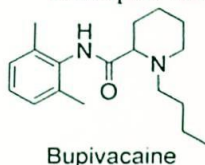
4. a. What are the products formed when penicillin is hydrolysed with hot dilute inorganic acids? Write their structures. 2
b. Write the structure of 6-amino penicillanic acid. Starting from this compound give the synthesis of penicillin-V 3
c. Draw the structure of penilloic acid. How is it formed from penicillin? Establish the presence of the thiazolidine ring in penilloic acid with chemical reactions. 5

5. a. What do you understand by drug metabolism? What is its importance? 5
- b. Draw the structure of L- and D-isomer of Cetirizine. Which isomer is more active towards allergies? Mention the mechanism of action of cetirizine. 2+1+2
= 5

6. a. Discuss the chiral synthesis of (S)-Halothane and discuss its nephrotoxicity. 3+2=5



- b. Discuss the structural essentials of local anaesthetics with example. Write down the synthetic route of Bupivacaine. 3+2=5



7. a. Give the structure of a monoamine neurotransmitter. Discuss its synthesis and metabolism. 5
- b. Discuss briefly the classification of antidepressant drugs. Write the synthetic route of an antidepressant drug. 2+3= 5
8. a. What is the use of Diclofenac? Draw its structure and describe its synthesis. 1+1+3
=5
- b. Mention the use of Atenolol. Draw its structure and describe its synthesis. 1+1+3
= 5

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