

Roll. No.

Question Booklet Number

O.M.R. Serial No.

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M.Sc. (SEM.-IV) (NEP) (SUPPLE.) EXAMINATION, 2024-25

CHEMISTRY

(Medicinal Chemistry)

Paper Code

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Question Booklet
Series

A

Time : 1 : 30 Hours

Max. Marks : 75

Instructions to the Examinee :

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.
4. Four alternative answers are mentioned for each question as - A, B, C & D in the booklet. The candidate has to choose the correct / answer and mark the same in the OMR Answer-Sheet as per the direction :

(Remaining instructions on last page)

परीक्षार्थियों के लिए निर्देश :

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, उसे तुरन्त बदल लें।
4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर- A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छानना है। उत्तर को OMR उत्तर-पत्रक में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

(शेष निर्देश अन्तिम पृष्ठ पर)

1. Few drugs are in an inactive form, i.e., they do not exert any physiological action in the body. These drugs require conversion in the body to one or more active metabolites. Such a drug is called :
 - (A) Soft Drug
 - (B) Prodrug
 - (C) Hard Drug
 - (D) None of the above
2. IND is ?
 - (A) Improved new drug
 - (B) Investigational new drug
 - (C) International new drug
 - (D) International novel drug
3. Structure Activity Relationship (SAR) mainly studies :
 - (A) Pharmacokinetics only
 - (B) Toxicity of drugs
 - (C) Relation between structure and pharmacological activity
 - (D) Synthetic pathway of drugs
4. Which of the following is an example of bioisosterism ?
 - (A) $-\text{CH}_3$ replaced by $-\text{H}$
 - (B) $-\text{O}-$ replaced by $-\text{NH}-$
 - (C) Aromatic ring replaced by alkyl chain
 - (D) Double bond replaced by single bond
5. The Occupancy theory states that:
 - (A) Drug action is proportional to the number of receptors occupied
 - (B) Drug action depends on the rate of association
 - (C) Drug induces conformational changes in receptors
 - (D) Drug binds irreversibly to receptors
6. Lipophilicity is usually expressed in terms of :
 - (A) pK_a
 - (B) Log P
 - (C) LD_{50}
 - (D) Surface tension
7. Pharmacodynamics is best described as:
 - (A) What the drug does to the body
 - (B) What the body does to the drug
 - (C) both (A) and (B)
 - (D) None of the above
8. Therapeutic Index (TI) is defined as :
 - (A) $\text{ED}_{50} / \text{LD}_{50}$
 - (B) $\text{TD}_{50} / \text{ED}_{50}$
 - (C) $\text{ED}_{50} / \text{TD}_{50}$
 - (D) $\text{LD}_{50} / \text{ED}_{50}$

9. Antineoplastic agents are used for treatment of :
 - (A) Diabetes
 - (B) Cancer
 - (C) Hypertension
 - (D) None of the above
10. A group of disease involving an abnormal and uncontrolled cell division in most of the normal body cells :
 - (A) Cancer
 - (B) Diabetes
 - (C) Hypertension
 - (D) None of the above
11. What is metastasis ?
 - (A) The uncontrolled division of normal cells
 - (B) The spread of cancer cells from the primary site to distant organs
 - (C) The process of programmed cell death
 - (D) The conversion of normal cells into cancerous cells
12. Who is father of Medicine ?
 - (A) Banting and Best
 - (B) Selman walksman
 - (C) Alexander fleming
 - (D) Hippocrates
13. Which of the following is an example of an alkylating agent?
 - (A) Cyclophosphamide
 - (B) Methotrexate
 - (C) Vincristine
 - (D) Doxorubicin
14. Paclitaxel (Taxol) is an example of :
 - (A) Alkylating agent
 - (B) Antimetabolite
 - (C) Mitotic inhibitor
 - (D) Antitumor antibiotic
15. The main mechanism of action of anthracycline antibiotics (like doxorubicin) is :
 - (A) Inhibition of microtubule formation
 - (B) Intercalation into DNA and inhibition of topoisomerase II
 - (C) Folic acid antagonism
 - (D) Alkylation of DNA
16. Which of the following is NOT a cardiovascular disease ?
 - (A) Hypertension
 - (B) Angina pectoris
 - (C) Myocardial infarction
 - (D) Tuberculosis

17. Ciprofloxacin acts mainly by :
 (A) Inhibiting bacterial cell wall synthesis
 (B) Inhibiting DNA gyrase and topoisomerase IV
 (C) Blocking protein synthesis at ribosomes
 (D) Inhibiting folate metabolism
18. Erytheromycin is :
 (A) Macrolide antibiotics
 (B) Antifungal
 (C) antiviral
 (D) None of the above
19. Ribosome helps in :
 (A) Protiene synthesis
 (B) Photosynthesis
 (C) Lipid synthesis
 (D) Respiration
20. Ring present in tetracycline ?
 (A) Phenanthrene
 (B) Thiozole
 (C) Pyridine
 (D) None of the above
21. Pharmacokinetics is :
 (A) The study of biological and therapeutics effects of drugs.
 (B) The study of absorption, distribution, metabolism and excretion of drugs.
 (C) The study of mechanism of drug action.
 (D) The study of methods of new drug
22. The function of enzymes in the living system is to :
 (A) Provide immunity
 (B) Catalyse biochemical reaction
 (C) Transport oxygen
 (D) Provide energy
23. Which ring present in penicillin ?
 (A) Pyrrole ring
 (B) Imidazole
 (C) Betalactum ring and thiazolidine ring
 (D) Betalactum ring and pyrrole ring
24. Chloroquine is used to treat :
 (A) Malaria
 (B) Rheumatoid arthritis
 (C) Lepra reaction
 (D) All of the above
25. Streptomycin belongs to :
 (A) Aminoglycosides
 (B) Macrolides
 (C) Sulfa drugs
 (D) Quinolones

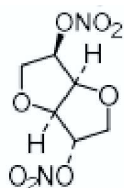
26. Tetracyclines inhibit :
- (A) 30S ribosome – block tRNA
 - (B) 50S ribosome
 - (C) DNA polymerase
 - (D) RNA polymerase
27. Chloramphenicol binds to:
- (A) 30S
 - (B) DNA gyrase
 - (C) 50S ribosome
 - (D) Folate enzyme
28. Amoxicillin differs from ampicillin by :
- (A) Para-hydroxyl group
 - (B) Sulfa group
 - (C) Fluorine substitution
 - (D) Lacking β -lactam
29. Penicillin G unstable orally because :
- (A) Destroyed by gastric acid
 - (B) Insoluble
 - (C) Not absorbed
 - (D) Enzyme resistant
30. β -lactam ring is :
- (A) Lactone
 - (B) Pyridine
 - (C) Four-membered cyclic amide
 - (D) Quinoline
31. Chlorpromazine discovered via :
- (A) Serendipity
 - (B) Rational design
 - (C) Herbal trial
 - (D) Biotech
32. Typical antipsychotics act on :
- (A) Dopamine D2 blockade
 - (B) GABA
 - (C) NMDA
 - (D) Histamine
33. Antidepressant discovered as anti-TB drug :
- (A) Fluoxetine
 - (B) Imipramine
 - (C) Amitriptyline
 - (D) Iproniazid
34. Oxazepam obtained by :
- (A) Hydroxylation of diazepam
 - (B) Nitration of benzene
 - (C) Oxidation of alcohol
 - (D) Reduction of nitro group
35. Diazepam synthesized from :
- (A) Nitrobenzene
 - (B) 2-amino-5-chlorobenzophenone
 - (C) Sorbitol
 - (D) Sulphonamide
36. What is the core nucleus present in Diazepam ?
- (A) Benzodiazepine ring
 - (B) Indole
 - (C) Quinoline
 - (D) Purine
37. Buspirone primarily acts as :
- (A) GABA agonist
 - (B) Dopamine antagonist
 - (C) NMDA blocker
 - (D) Partial agonist at 5-HT_{1A}

38. Benzodiazepines act on :
 (A) GABA-A receptors
 (B) GABA-B receptors
 (C) Dopamine receptors
 (D) 5-HT receptors
39. Ciprofloxacin is highly effective against :
 (A) Fungi
 (B) Gram-negative bacteria
 (C) Viruses
 (D) Parasites
40. Dapsone structure resembles :
 (A) Sulphonamides
 (B) Penicillins
 (C) Quinolones
 (D) Tetracyclines
41. The primary mechanism of action of Chloroquine is :
 (A) Inhibiting heme polymerization in malaria parasite
 (B) Inhibiting DNA gyrase
 (C) Inhibiting ribosomes
 (D) Blocking folate
42. Ethambutol exerts its anti-tubercular action by inhibiting :
 (A) DNA gyrase
 (B) RNA polymerase
 (C) Protein synthesis
 (D) Arabinosyl transferase in TB cell wall
43. Ethionamide is primarily used in the treatment of :
 (A) Tuberculosis
 (B) Malaria
 (C) Leprosy
 (D) Fungal
44. Dapsone is primarily used in the treatment of :
 (A) Malaria
 (B) Tuberculosis
 (C) Leprosy
 (D) Fungal infection
45. Norfloxacin belongs to :
 (A) Fluoroquinolones
 (B) Macrolides
 (C) β -lactams
 (D) Aminoglycosides
46. Sulfonamides exert their antibacterial action by inhibiting :
 (A) DNA gyrase
 (B) Dihydropteroate synthetase
 (C) RNA polymerase
 (D) Transpeptidase
47. Sorbitrate synthesized by :
 (A) Oxidation of sucrose
 (B) Reduction of glucose
 (C) Nitration of sorbitol
 (D) Sulfonation of alcohol

48. Amyl nitrite used in :
- (A) Angina and cyanide poisoning
 - (B) Asthma
 - (C) Tuberculosis
 - (D) Epilepsy
49. Reserpine lowers blood pressure by :
- (A) Increasing NE release
 - (B) Beta-blockade
 - (C) Vasodilation
 - (D) Blocking norepinephrine storage in vesicles
50. Tamoxifen is used in:
- (A) Hormone-sensitive breast cancer
 - (B) Colon cancer
 - (C) Leukemia only
 - (D) Skin cancer
51. Bleomycin causes :
- (A) DNA strand breaks
 - (B) Protein denaturation
 - (C) Microtubule inhibition
 - (D) RNA splicing inhibition
52. Vincristine acts by :
- (A) Inhibiting folate metabolism
 - (B) Inhibiting topoisomerase
 - (C) Crosslinking DNA
 - (D) Inhibiting microtubule assembly
53. Doxorubicin is a :
- (A) Carcinolytic antibiotic
 - (B) Antimetabolite
 - (C) Alkylating agent
 - (D) Mitotic inhibitor
54. Which of the following is not a viral disease ?
- (A) Small pox
 - (B) Typhoid
 - (C) Rabies
 - (D) Encephalitis
55. 5-Fluorouracil is a :
- (A) Pyrimidine analog
 - (B) Purine analog
 - (C) Alkaloid
 - (D) Antibiotic
56. Methotrexate exerts its pharmacological effect by inhibiting:
- (A) DNA polymerase
 - (B) RNA polymerase
 - (C) Topoisomerase
 - (D) Dihydrofolate reductase
57. Cyclophosphamide is a :
- (A) Alkylating agent
 - (B) Antimetabolite
 - (C) Antibiotic
 - (D) Mitotic inhibitor

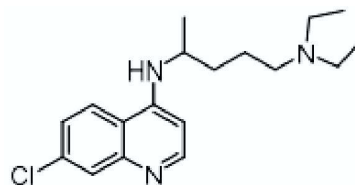
58. Alkylating agents exert their anticancer effects primarily by :
- Blocking protein synthesis
 - Inhibiting ribosomes
 - Cross-linking DNA
 - DNA unwinding
59. Main problem of cancer chemotherapy :
- Lack of specificity and toxicity
 - No oral absorption
 - Inactive against bacteria
 - Poor solubility
60. An antagonist is a drug that :
- Blocks receptor without producing effect
 - Increases absorption
 - Enhances agonist
 - None of the above
61. Which of the following diseases is not caused by bacteria ?
- Pneumonia
 - Meningitis
 - Syphilis
 - Poliomyelitis
62. Bioavailability refers to :
- Amount of drug absorbed unchanged reaching systemic circulation
 - Amount excreted in urine
 - Metabolized drug
 - Toxic portion
63. Volume of distribution (V_d) relates to :
- Drug clearance
 - Drug distribution in body relative to plasma concentration
 - Absorption rate
 - Excretion only
64. Hansch analysis includes :
- Only steric factors
 - Only receptor binding
 - Toxic effects
 - Hydrophobic, electronic, steric factors
65. Free-Wilson analysis is based on:
- Additivity of substituent contributions
 - Hydrophobic constants
 - Toxicology
 - Drug receptors
66. Induced fit theory suggests :
- Receptor is rigid
 - Receptor changes shape to fit drug
 - Drug always breaks receptor
 - None of the above

67. The inductive effect is related to :
- Resonance electron delocalization
 - Electron withdrawing/donating through sigma bonds
 - Bioisosterism
 - Steric hindrance
68. Which concept modifies drug structure to improve activity?
- Lead modification
 - Pharmacovigilance
 - Pharmacodynamics
 - Non of the above
69. Sarcoma is a cancer which arises from the abnormal growth of :
- Ectoderm
 - Mesoderm
 - Endoderm
 - All of the above
70. The name of the given drug is :



- Atenol
- Glucose
- Sorbitrate
- None of these

71. Which of the following is not a antitubercular drugs ?
- Isoniazid
 - Ethambutol
 - Taxol
 - None of these
72. PABA (p-Amino benzoic acid) help in the synthesis of ?
- Folic acid
 - Benzoic acid
 - Tartaric acid
 - None of the above
73. The name of the given drug is ?

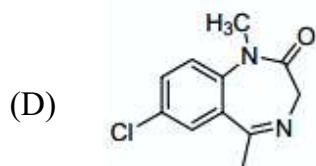
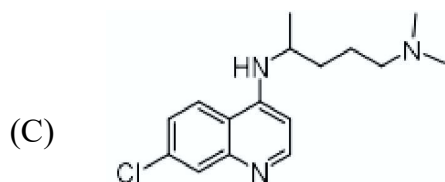
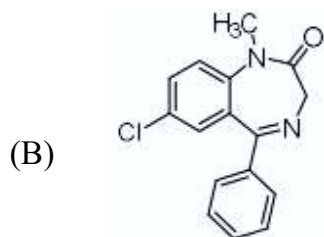
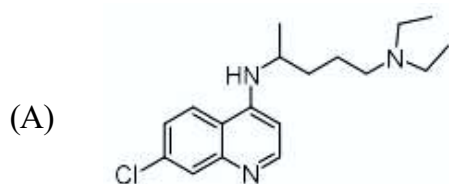


- Chloroquine
 - Sorbitrate
 - Primaquine
 - None of the above
74. The drug that are used when there is a lack of natural chemical messenger is called :
- Agonist
 - Antagonist
 - Analgesic
 - Narcotics

75. Isoniazid is used for the treatment of tuberculosis, which is derivative of :

- (A) Indole
- (B) Pyrrole
- (C) Pyridine
- (D) None of the above

76. Which of the following structure represent diazepam?



77. Reserpine is a psychoactive drug, isolated from?

- (A) *Rauwolfia serpentina*
- (B) *Rauwolfia vomitoria*

(C) Both (A) and (B)

(D) None of the above

78. Which class of drugs is primarily used to lower cholesterol levels?

- (A) β -blockers
- (B) Statins
- (C) ACE inhibitors
- (D) Diuretics

79. What is the definition of medicinal chemistry ?

- (A) The study of chemical reactions in living organism
- (B) The study of drugs and their interaction with biological system
- (C) The study of chemical compounds in the environment
- (D) The study of properties of molecules

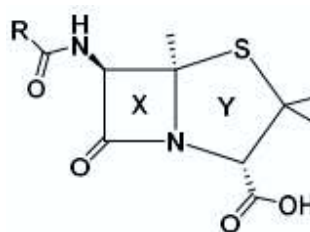
80. Which of the following used for the hypertension?

- (A) Paracetamol
- (B) Antacid
- (C) Aspirin
- (D) Reserpine

81. Which of the following factors can affect drug metabolism?

- (A) Genetics
- (B) Age
- (C) Diet
- (D) All of the above

82. Which of the following neurotransmitters is considered cholinergic?
- (A) Dopamine
(B) Serotonin
(C) Acetylcholine
(D) Norepinephrine
83. Which of the following antipsychotic drugs is a phenothiazine derivative?
- (A) Haloperidol
(B) Clozapine
(C) Thiothexine
(D) Chlorpromazine
84. 5-Fluorouracil (5-FU) mainly inhibits:
- (A) Thymidylate synthase
(B) Dihydrofolate reductase
(C) DNA polymerase
(D) RNA polymerase
85. The alkylating agents are thought to react with the :
- (A) 7- position of guanine
(B) 2- position of guanine
(C) Both (A) and (B)
(D) None of the above
86. Which of the following is not an antimicrobial agent?
- (A) Sulfadoxine
(B) Sulfadiazine
(C) Sulfamoxole
(D) Taxol
87. The study of the processes of absorption, distribution, metabolism, and excretion of a drug is known as :
- (A) Pharmacodynamics
(B) Pharmacokinetics
(C) Pharmacogenetics
(D) None of the above
88. Which of the following is NOT a common method of lead modification?
- (A) Chain modification
(B) Ring expansion/contraction
(C) Bioisosteric replacement
(D) Salt formation only
89. Isostere of CO_2 is ?
- (A) N_2
(B) CO
(C) N_2O
(D) O_2
90. In this structure ring X and Y are known as :



- (A) X = β -lactam ring, Y = Thiazolidine ring
(B) X = pyrrole ring, Y = Thiazolidine ring
(C) X = furan ring, Y = Benzene ring
(D) None of the above

91. Which of the following are antibacterial ?
 (A) Penicillin
 (B) Sulphapyridine
 (C) Ciprofloxacin
 (D) All of the above
92. Mostly the drugs metabolism occurs in :
 (A) Liver
 (B) Kidney
 (C) Pancreas
 (D) Gastrointestinal tract
93. Which of the following is not a viral disease ?
 (A) Small Pox
 (B) Rabies
 (C) Both (A) and (B)
 (D) None of these
94. Which of the following drugs reduced fever :
 (A) Analgesic
 (B) Antibiotic
 (C) Antipyretics
 (D) Tranquillizer
95. Class of medicinal products used to treat stress is:
 (A) Antiseptic
 (B) Analgesic
 (C) Antihistamine
 (D) Tranquilizers
96. Which is known as father of chemotherapy :
 (A) Alexander Fleming
 (B) Howard Florey
 (C) Paul Ehrlich
 (D) Emst Boris Chain
97. Among the following narcotics analgesic is :
 (A) Heroin
 (B) Ibuprofen
 (C) Naproxen
 (D) Aspirin
98. Barbiturate is a :
 (A) 6-membered ring with one N atoms
 (B) 6-membered ring with two N atoms
 (C) 6-membered ring with three N atoms
 (D) 6-membered ring with four N atoms
99. Streptomycin is effective in the treatment of :
 (A) Tuberculosis
 (B) Malaria
 (C) Typhoid
 (D) Cholera
100. The term "prodrug" was introduced by:
 (A) Adrian albert
 (B) Lineaus
 (C) Hippocrates
 (D) None of the above

ROUGH WORK

ROUGH WORK

Example :

Question :

Q.1 (A) ● (C) (D)

Q.2 (A) (B) ● (D)

Q.3 (A) ● (C) (D)

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination, candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager & cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

Impt. On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

उदाहरण :

प्रश्न :

प्रश्न 1 (A) ● (C) (D)

प्रश्न 2 (A) (B) ● (D)

प्रश्न 3 (A) ● (C) (D)

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ०एम०आर० उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैल्कुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

महत्वपूर्ण: प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्नपुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरिज की दूसरी प्रश्नपुस्तिका प्राप्त कर लें।