

Roll No.

Question Booklet Number

O. M. R. Serial No.

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M. Sc. (Fourth Semester)
(NEP) EXAMINATION, 2025-26
CHEMISTRY
(Chemistry of Natural Products)

Paper Code						
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Questions Booklet
Series

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Time : 1:30 Hours]

[Maximum 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.

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, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

(Only for Rough Work)

1. Natural pyrethrins are obtained from :
 - (A) Chrysanthemum flowers
 - (B) Tobacco leaves
 - (C) Cinchona bark
 - (D) Neem flowers
2. Prostaglandins are mainly synthesized in :
 - (A) Kidney only
 - (B) Liver only
 - (C) Almost all body tissues
 - (D) Brain only
3. Chlorophyll contains which central metal ion ?
 - (A) Iron
 - (B) Copper
 - (C) Magnesium
 - (D) Zinc
4. Progesterone mainly regulates :
 - (A) Blood pressure
 - (B) Pregnancy and menstrual cycle
 - (C) Digestion
 - (D) Oxygen transport
5. Cholesterol is a precursor for the synthesis of :
 - (A) Steroid hormones
 - (B) Carbohydrates
 - (C) Proteins
 - (D) Vitamins
6. The "E" in PGE₂ indicates :
 - (A) Ester group
 - (B) Ketone group in the cyclopentane ring
 - (C) Ether group
 - (D) Amide group
7. Prostaglandins belong to the group of :
 - (A) Steroids
 - (B) Eicosanoids
 - (C) Terpenoids
 - (D) Alkaloids

8. Steroids are derived from the basic skeleton known as :
- (A) Cholane
 - (B) Cyclopentanoperhydrophenanthrene
 - (C) Benzene
 - (D) Naphthalene
9. Which of the following is the primary function of haemoglobin the human body ?
- (A) Transport of oxygen
 - (B) Transport of glucose
 - (C) Production of hormones
 - (D) Storage of fats
10. Alkaloids are generally extracted from plant materials using :
- (A) Dilute acid
 - (B) Dilute base
 - (C) Alcohol
 - (D) Ether only
11. Pyrethroids degrade rapidly in :
- (A) Darkness
 - (B) Sunlight
 - (C) Water
 - (D) Ice
12. Rotenone inhibits :
- (A) Glycolysis
 - (B) DNA replication
 - (C) Protein synthesis
 - (D) Electron transport chain
13. Steroid hormones are synthesized from :
- (A) Cholesterol
 - (B) Glucose
 - (C) Protein
 - (D) DNA
14. Natural insecticides include :
- (A) Pyrethrins
 - (B) Rotenone
 - (C) Nicotine
 - (D) All of the above
15. Natural products are obtained from :
- (A) Plants
 - (B) Animals
 - (C) Microorganisms
 - (D) All of the above

16. Flavonoids protect plants from :
- (A) UV radiation
 - (B) Cold
 - (C) Heat
 - (D) Gravity
17. Anthocyanins give :
- (A) Red/blue colors
 - (B) Green color
 - (C) Yellow color
 - (D) White color
18. IR spectroscopy identifies :
- (A) Color
 - (B) Molecular weight
 - (C) Functional groups
 - (D) Density
19. Rotenone acts by inhibiting :
- (A) Cellular respiration
 - (B) Photosynthesis
 - (C) Digestion
 - (D) DNA synthesis
20. Rotenone belongs to :
- (A) Terpenoids
 - (B) Alkaloids
 - (C) Steroids
 - (D) Flavonoids
21. Pyrethroids affect insect :
- (A) Digestive system
 - (B) Nervous system
 - (C) Respiratory system
 - (D) Circulatory system
22. Pyrethroids are used as :
- (A) Insecticides
 - (B) Antibiotics
 - (C) Vitamins
 - (D) Hormones
23. Prostaglandins act as :
- (A) Local hormones
 - (B) Vitamins
 - (C) Enzymes
 - (D) Pigments

24. Prostaglandins are involved in :
- (A) Inflammation
 - (B) Blood pressure regulation
 - (C) Smooth muscle contraction
 - (D) All of the above
25. PGE₂ contains :
- (A) Ketone group
 - (B) Aldehyde group
 - (C) Ester group
 - (D) Amide group
26. Prostaglandins are derived from :
- (A) Arachidonic acid
 - (B) Acetic acid
 - (C) Lactic acid
 - (D) Stearic acid
27. Porphyrins contain :
- (A) Four pyrrole rings
 - (B) Two pyrrole rings
 - (C) Three pyrrole rings
 - (D) Five pyrrole rings
28. Myricetin belongs to :
- (A) Flavonol
 - (B) Flavones
 - (C) Steroids
 - (D) Alkaloids
29. Flavonoids are biosynthesized by :
- (A) Acetate pathway
 - (B) Shikimic acid pathway
 - (C) Both (A) and (B)
 - (D) Glycolysis
30. Cyanidin pigments belong to :
- (A) Alkaloids
 - (B) Flavones
 - (C) Anthocyanins
 - (D) Steroids
31. Quercetin-3-glucoside is a/an :
- (A) Steroid
 - (B) Alkaloid
 - (C) Glycoside
 - (D) Terpenoid
32. Quercetin belongs to :
- (A) Flavones
 - (B) Flavonols
 - (C) Steroids
 - (D) Alkaloids

33. Apigenin belongs to :
- (A) Flavone
 - (B) Flavonol
 - (C) Anthocyanin
 - (D) Chalcone
34. Bile acids are derived from :
- (A) Cholesterol
 - (B) Glucose
 - (C) Protein
 - (D) Fatty acids
35. Nicotine contains :
- (A) Pyridine ring
 - (B) Benzene ring
 - (C) Cyclopropane ring
 - (D) Steroid ring
36. Aldosterone regulates :
- (A) Respiration
 - (B) Digestion
 - (C) Vision
 - (D) Salt and water balance
37. Estrone is a :
- (A) Female hormone
 - (B) Male hormone
 - (C) Vitamin
 - (D) Enzyme
38. The steroid nucleus is called :
- (A) Cyclopentanoperhydrophenanthrene
 - (B) Benzene nucleus
 - (C) Naphthalene nucleus
 - (D) Anthracene nucleus
39. Alkaloids usually have :
- (A) Bitter taste
 - (B) Sweet taste
 - (C) Sour taste
 - (D) Salty taste
40. Quinine is used for the treatment of :
- (A) Cancer
 - (B) Malaria
 - (C) Diabetes
 - (D) Hypertension
41. Morphine is obtained from :
- (A) Opium poppy
 - (B) Tobacco plant
 - (C) Tea plant
 - (D) Coffee plant
42. The term alkaloid was introduced by :
- (A) Meissner
 - (B) Robinson
 - (C) Fischer
 - (D) Kekule

43. β -Carotene contains :
- (A) 30 carbon atoms
 - (B) 40 carbon atoms
 - (C) 20 carbon atoms
 - (D) 15 carbon atoms
44. Zingiberene is present in :
- (A) Ginger oil
 - (B) Rose oil
 - (C) Pine oil
 - (D) Mint oil
45. Menthol is obtained from :
- (A) Peppermint oil
 - (B) Lemon oil
 - (C) Rose oil
 - (D) Ginger oil
46. The biosynthetic precursor of terpenoids is :
- (A) Glucose
 - (B) IPP
 - (C) Pyruvate
 - (D) Acetate
47. Citral is chemically a/an :
- (A) Ketone
 - (B) Aldehyde
 - (C) Alcohol
 - (D) Ester
48. β -Carotene belongs to :
- (A) Monoterpenes
 - (B) Diterpenes
 - (C) Tetraterpenes
 - (D) Sesquiterpenes
49. Sesquiterpenes contain :
- (A) 10 carbons
 - (B) 15 carbons
 - (C) 20 carbons
 - (D) 30 carbons
50. The molecular formula of isoprene is :
- (A) C_4H_8
 - (B) C_5H_8
 - (C) C_6H_6
 - (D) C_3H_6

51. Rotenone acts by inhibiting :
- (A) Photosynthesis
 - (B) Cellular respiration
 - (C) Protein synthesis
 - (D) DNA replication
52. A characteristic structural feature of pyrethroids is the presence of :
- (A) Cyclopropane ring
 - (B) Benzene ring only
 - (C) Pyridine ring
 - (D) Pyrrole ring
53. Which of the following form of iron is present in heme ?
- (A) Ferrous form
 - (B) Ferric form
 - (C) Sodium
 - (D) Potassium
54. The antimalaria drug is :
- (A) Nicotine
 - (B) Cocaine
 - (C) Meroquinone
 - (D) Quinine
55. Which alkaloid contains two benzene rings and an isoquinoline nucleus ?
- (A) Papaverine
 - (B) Nicotine
 - (C) Caffeine
 - (D) Quinine
56. Hormones :
- (A) act as coenzyme
 - (B) act as enzyme
 - (C) influence synthesis of enzymes
 - (D) belong to B-complex
57. Which one of the following terpenes is a cyclic terpene ?
- (A) Mycrene
 - (B) Limonene
 - (C) Natural rubber
 - (D) Squalene
58. Atropine when moistened with fuming HNO_3 followed by evaporation to dryness, develops stain whose colour is :
- (A) White
 - (B) Black
 - (C) Yellow
 - (D) Blue
59. Bile acids are derived from :
- (A) Cholesterol
 - (B) Glucose
 - (C) Protein
 - (D) Fatty acids
60. Which enzyme is produced by liver ?
- (A) Alkaline phosphate
 - (B) Alanine transaminase
 - (C) Aspartate transaminase
 - (D) All of the above

61. Quinine is mainly used for the treatment of :
- (A) Tuberculosis
 - (B) Malaria
 - (C) Diabetes
 - (D) Hypertension
62. The highest level of protein structure seen in myoglobin is :
- (A) Primary
 - (B) Secondary
 - (C) Tertiary
 - (D) Quaternary
63. Zingiberene is present in :
- (A) Turpentine oil
 - (B) Ginger oil
 - (C) Rose oil
 - (D) Geranium oil
64. When Zingiberene is ozonolysed, it yields the products :
- (A) Acetone + Cadalene + Succinic acid
 - (B) Acetone + Laevulic acid + Succinic acid
 - (C) Acetone + Succinic acid
 - (D) Acetone + Laevulic acid + Palmitic acid
65. The rule that explains the formation of terpenoids from isoprene units is called :
- (A) Huckel rule
 - (B) Markovnikov rule
 - (C) Isoprene rule
 - (D) Saytzeff rule
66. Ephedrine belongs to which class of alkaloids ?
- (A) True alkaloids
 - (B) Protoalkaloids
 - (C) Pseudoalkaloids
 - (D) Indole alkaloids
67. Carotenoids are mainly responsible for :
- (A) Green color of plants
 - (B) Yellow and orange pigments
 - (C) Blue pigments
 - (D) White pigments
68. Which one of the following is *not* considered as an alkaloid ?
- (A) Nicotine
 - (B) Ephedrine
 - (C) Zinziberene
 - (D) Quinine

69. Citral is chemically a/an :
- (A) Ketone
 - (B) Aldehyde
 - (C) Alcohol
 - (D) Ester
70. The oxidation state of iron in methemoglobin is :
- (A) 3
 - (B) 2
 - (C) 4
 - (D) Zero
71. Alkaloids with Mayer's test gives :
- (A) green colour
 - (B) red colour
 - (C) cream and pale yellow
 - (D) violet colour
72. Which of the following is most stable type of Prostaglandins ?
- (A) A
 - (B) O
 - (C) D
 - (D) F
73. Cis-isomer of citral is known as :
- (A) Geranial
 - (B) Nerol
 - (C) \pm menthol
 - (D) *p*-cymene
74. Which alkaloid is used extensively in ophthalmic practice ?
- (A) Atropine
 - (B) Quinine
 - (C) Nicotine
 - (D) Morphine
75. Molecular formula of Morphine is :
- (A) $C_{16}H_{19}O_3N$
 - (B) $C_{17}H_{19}O_3N$
 - (C) $C_{17}H_{20}O_3N$
 - (D) $C_{18}H_{20}O_3N$
76. The prostaglandins PGE₂ and PGF₂ are involved in :
- (A) Inflammation
 - (B) Intoxication
 - (C) Excitation
 - (D) Neurotoxicity
77. On hydrolysis atropine gives :
- (A) Atropic acid
 - (B) Tropic acid + Tropine
 - (C) Phenyl acetic acid + HCHO
 - (D) Tropic acid + HCHO
78. Geraniol on cyclisation with dil. H_2SO_4 gives :
- (A) *p*-cymené
 - (B) -terpineol
 - (C) Isoprene
 - (D) α -pinene

79. Atropic acid on oxidation with KMnO_4 gives :
- (A) Benzoic acid
 - (B) Formic acid
 - (C) Tropinic acid
 - (D) Tropic acid
80. Wagner's reagent is :
- (A) Potassium mercuric iodide
 - (B) Iodine dissolved in potassium iodide
 - (C) Potassium bismuth iodide
 - (D) Potassium sulphur iodide
81. Identity the compound Cyclohexene ring with isopropenyl group at C-1 and methyl group at C-4 :
- (A) Limonene
 - (B) Pinene
 - (C) Camphor
 - (D) Terpeneol
82. Which of the following structure corresponds to alkaloid in which Purine ring with three methyl groups at N-1, N-3, N-7 ?
- (A) Theobromine
 - (B) Xanthine
 - (C) Caffeine
 - (D) Adenine
83. Which compound possesses the following phenanthrene nucleus with tertiary amine ?
- (A) Morphine
 - (B) Nicotine
 - (C) Atropine
 - (D) Quinine
84. Which of the following structure corresponds to alkaloid in which Pyridine ring is attached to pyrrolidine ring
- (A) Coniine
 - (B) Nicotine
 - (C) Morphine
 - (D) Papaverine
85. Which alkaloid contains the indole nucleus fused with a complex polycyclic system ?
- (A) Reserpine
 - (B) Atropine
 - (C) Coniine
 - (D) Nicotine

86. Nicotine contains both a pyridine ring and a pyrrolidine ring. Which of the following statements best explains its behavior in acid-base reactions ?
- (A) The pyrrolidine nitrogen is more basic because its lone pair is more available
- (B) The pyridine nitrogen is more basic due to resonance stabilization
- (C) Both nitrogen atoms are equally basic and get protonated simultaneously
- (D) Neither nitrogen shows basic character due to electron delocalization
87. Structure consists of two isoprene units joined head-to-tail :
- (A) Hemiterpene
- (B) Monoterpene
- (C) Sesquiterpene
- (D) Diterpene
88. Bicyclic monoterpene with a bridgehead double bond :
- (A) α -Pinene
- (B) Linalool
- (C) Citral
- (D) Geraniol
89. Linear aldehyde terpene with two double bonds :
- $$\text{CH}_3\text{-C}(\text{CH}_3)\text{=CH-CH}_2\text{-CH} \\ \text{=C}(\text{CH}_3)\text{-CHO}$$
- (A) Geraniol
- (B) Citral
- (C) Myrcene
- (D) Farnesol
90. Vitexin is a/an :
- (A) Flavone glycoside
- (B) Steroid glycoside
- (C) Alkaloid glycoside
- (D) Terpene glycoside
91. Flavonoids belong to which class of compounds ?
- (A) Alkaloids
- (B) Polyphenols
- (C) Steroids
- (D) Terpenoids
92. Geraniol does not contain :
- (A) Unsaturation
- (B) Primary alcoholic group
- (C) Aldehydic group
- (D) None of the above

93. How many isoprene unit are present in camphor ?
- (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
94. Steroids are biosynthesized from :
- (A) Glucose
 - (B) Acetate
 - (C) Amino acids
 - (D) Fatty acids
95. Quinine is mainly used for the treatment of :
- (A) Tuberculosis
 - (B) Malaria
 - (C) Diabetes
 - (D) Hypertension
96. Citral on give laevulinic acid.
- (A) Reduction
 - (B) Ozonolysis
 - (C) Br₂ water
 - (D) Oxidation
97. -OCH₃ is detected in terpenoid by :
- (A) Zeisel's method
 - (B) Hoffmann method
 - (C) Herzig method
 - (D) None of the above
98. Rubber is a :
- (A) Carbohydrate
 - (B) Protein
 - (C) Fiber
 - (D) Fat
99. Steroids contain how many fused rings ?
- (A) Three
 - (B) Four
 - (C) Five
 - (D) Six
100. Infrared (IR) spectroscopy is mainly used to identify :
- (A) Molecular weight
 - (B) Functional groups
 - (C) Carbon skeleton
 - (D) Isotopes

(Only for Rough Work)

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 :

Example :

Question :

- Q. 1 (A) ● (C) (D)
 Q. 2 (A) (B) ● (D)
 Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

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 and 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.

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 छाँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

उदाहरण :

प्रश्न :

- प्रश्न 1 (A) ● (C) (D)
 प्रश्न 2 (A) (B) ● (D)
 प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. 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. ओ. एम. आर. 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 के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, 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 प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।