Roll No. .....

Question Booklet Number

O. M. R. Serial No.

M. Sc. (Fourth Semester)

(NEP) EXAMINATION, 2025-26

CHEMISTRY

(Chemistry of Natural Products)

Paper Code							
B	0	2	1	0	0	3	T

Questions Booklet Series
A

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. The molecular formula of isoprene is :

(A) C_4H_8

(B) C_5H_8

(C) C_6H_6

(D) C_3H_6

2. Sesquiterpenes contain :

(A) 10 carbons

(B) 15 carbons

(C) 20 carbons

(D) 30 carbons

3. β- Carotene belongs to :

(A) Monoterpenes

(B) Diterpenes

(C) Tetraterpenes

(D) Sesquiterpenes

4. Citral is chemically a/an :

(A) Ketone

(B) Aldehyde

(C) Alcohol

(D) Ester

5. The biosynthetic precursor of terpenoids is :

(A) Glucose

(B) IPP

(C) Pyruvate

(D) Acetate

6. Menthol is obtained from :

(A) Peppermint oil

(B) Lemon oil

(C) Rose oil

(D) Ginger oil

7. Zingiberene is present in :

(A) Ginger oil

(B) Rose oil

(C) Pine oil

(D) Mint oil

8. β- Carotene contains :

(A) 30 carbon atoms

(B) 40 carbon atoms

(C) 20 carbon atoms

(D) 15 carbon atoms

9. The term alkaloid was introduced by :

(A) Meissner

(B) Robinson

(C) Fischer

(D) Kekule

10. Morphine is obtained from :

(A) Opium poppy

(B) Tobacco plant

(C) Tea plant

(D) Coffee plant

11. Quinine is used for the treatment of :

(A) Cancer

(B) Malaria

(C) Diabetes

(D) Hypertension

12. Alkaloids usually have :

(A) Bitter taste

(B) Sweet taste

(C) Sour taste

(D) Salty taste

13. The steroid nucleus is called :

(A) Cyclopentanoperhydrophen-anthrene

(B) Benzene nucleus

(C) Naphthalene nucleus

(D) Anthracene nucleus

14. Estrone is a :

(A) Female hormone

(B) Male hormone

(C) Vitamin

(D) Enzyme

15. Aldosterone regulates :

(A) Respiration

(B) Digestion

(C) Vision

(D) Salt and water balance

16. Nicotine contains :

(A) Pyridine ring

(B) Benzene ring

(C) Cyclopropane ring

(D) Steroid ring

17. Bile acids are derived from :

(A) Cholesterol

(B) Glucose

(C) Protein

(D) Fatty acids

18. Apigenin belongs to :

(A) Flavone

(B) Flavonol

(C) Anthocyanin

(D) Chalcone

19. Quercetin belongs to :

(A) Flavones

(B) Flavonols

(C) Steroids

(D) Alkaloids

20. Quercetin-3-glucoside is a/an :

(A) Steroid

(B) Alkaloid

(C) Glycoside

(D) Terpenoid

21. Cyanidin pigments belong to :

(A) Alkaloids

(B) Flavones

(C) Anthocyanins

(D) Steroids

22. Flavonoids are biosynthesized by :

(A) Acetate pathway

(B) Shikimic acid pathway

(C) Both (A) and (B)

(D) Glycolysis

23. Myricetin belongs to :

(A) Flavonol

(B) Flavones

(C) Steroids

(D) Alkaloids

24. Porphyrins contain :

(A) Four pyrrole rings

(B) Two pyrrole rings

(C) Three pyrrole rings

(D) Five pyrrole rings

25. Prostaglandins are derived from :

(A) Arachidonic acid

(B) Acetic acid

(C) Lactic acid

(D) Stearic acid

26. PGE_2 contains :

(A) Ketone group

(B) Aldehyde group

(C) Ester group

(D) Amide group

27. Prostaglandins are involved in :

(A) Inflammation

(B) Blood pressure regulation

(C) Smooth muscle contraction

(D) All of the above

28. Prostaglandins act as :

(A) Local hormones

(B) Vitamins

(C) Enzymes

(D) Pigments

29. Pyrethroids are used as :

(A) Insecticides

(B) Antibiotics

(C) Vitamins

(D) Hormones

30. Pyrethroids affect insect :

(A) Digestive system

(B) Nervous system

(C) Respiratory system

(D) Circulatory system

31. Rotenone belongs to :

(A) Terpenoids

(B) Alkaloids

(C) Steroids

(D) Flavonoids

32. Rotenone acts by inhibiting :

(A) Cellular respiration

(B) Photosynthesis

(C) Digestion

(D) DNA synthesis

33. IR spectroscopy identifies :

(A) Color

(B) Molecular weight

(C) Functional groups

(D) Density

34. Anthocyanins give :

(A) Red/blue colors

(B) Green color

(C) Yellow color

(D) White color

35. Flavonoids protect plants from :

(A) UV radiation

(B) Cold

(C) Heat

(D) Gravity

36. Natural products are obtained from :

(A) Plants

(B) Animals

(C) Microorganisms

(D) All of the above

37. Natural insecticides include :

(A) Pyrethrins

(B) Rotenone

(C) Nicotine

(D) All of the above

38. Steroid hormones are synthesized from :

(A) Cholesterol

(B) Glucose

(C) Protein

(D) DNA

39. Rotenone inhibits :

(A) Glycolysis

(B) DNA replication

(C) Protein synthesis

(D) Electron transport chain

40. Pyrethroids degrade rapidly in :

(A) Darkness

(B) Sunlight

(C) Water

(D) Ice

41. Alkaloids are generally extracted from plant materials using :

(A) Dilute acid

(B) Dilute base

(C) Alcohol

(D) Ether only

42. 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

43. Steroids are derived from the basic skeleton known as :

(A) Cholane

(B) Cyclopentanoperhydrophen-anthrene

(C) Benzene

(D) Naphthalene

44. Prostaglandins belong to the group of :

(A) Steroids

(B) Eicosanoids

(C) Terpenoids

(D) Alkaloids

45. The "E" in PGE_2 indicates :

(A) Ester group

(B) Ketone group in the cyclopentane ring

(C) Ether group

(D) Amide group

46. Cholesterol is a precursor for the synthesis of :

(A) Steroid hormones

(B) Carbohydrates

(C) Proteins

(D) Vitamins

47. Progesterone mainly regulates :

(A) Blood pressure

(B) Pregnancy and menstrual cycle

(C) Digestion

(D) Oxygen transport

48. Chlorophyll contains which central metal ion ?

(A) Iron

(B) Copper

(C) Magnesium

(D) Zinc

49. Prostaglandins are mainly synthesized in :

(A) Kidney only

(B) Liver only

(C) Almost all body tissues

(D) Brain only

50. Natural pyrethrins are obtained from :

(A) Chrysanthemum flowers

(B) Tobacco leaves

(C) Cinchona bark

(D) Neem flowers

51. Infrared (IR) spectroscopy is mainly used to identify :

(A) Molecular weight

(B) Functional groups

(C) Carbon skeleton

(D) Isotopes

52. Steroids contain how many fused rings ?

(A) Three

(B) Four

(C) Five

(D) Six

53. Rubber is a :

(A) Carbohydrate

(B) Protein

(C) Fiber

(D) Fat

54. $-OCH_3$ is detected in terpenoid by :

(A) Zeizel's method

(B) Hoffmann method

(C) Herzig method

(D) None of the above

55. Citral on ..... give laevulinic acid.

(A) Reduction

(B) Ozonolysis

(C) Br_2 water

(D) Oxidation

56. Quinine is mainly used for the treatment of :

(A) Tuberculosis

(B) Malaria

(C) Diabetes

(D) Hypertension

57. Steroids are biosynthesized from :

(A) Glucose

(B) Acetate

(C) Amino acids

(D) Fatty acids

58. How many isoprene unit are present in camphor ?

(A) 1

(B) 2

(C) 3

(D) 4

59. Geraniol does not contain :

(A) Unsaturation

(B) Primary alcoholic group

(C) Aldehydic group

(D) None of the above

60. Flavonoids belong to which class of compounds ?

(A) Alkaloids

(B) Polyphenols

(C) Steroids

(D) Terpenoids

61. Vitexin is a/an :

(A) Flavone glycoside

(B) Steroid glycoside

(C) Alkaloid glycoside

(D) Terpene glycoside

62. Linear aldehyde terpene with two double bonds :

$CH_3–C(CH_3)=CH–CH_2–CH$
$=C(CH_3)– CHO$

(A) Geraniol

(B) Citral

(C) Myrcene

(D) Farnesol

63. Bicyclic monoterpene with a bridgehead double bond :

(A) α-Pinene

(B) Linalool

(C) Citral

(D) Geraniol

64. Structure consists of two isoprene units joined head-to-tail :

(A) Hemiterpene

(B) Monoterpene

(C) Sesquiterpene

(D) Diterpene

65. 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

66. Which alkaloid contains the indole nucleus fused with a complex polycyclic system ?

(A) Reserpine

(B) Atropine

(C) Coniine

(D) Nicotine

67. 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

68. Which compound possesses the following phenanthrene nucleus with tertiary amine ?

(A) Morphine

(B) Nicotine

(C) Atropine

(D) Quinine

69. 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

70. Identity the compound Cyclohexene ring with isopropenyl group at C-1 and methyl group at C-4 :

(A) Limonene

(B) Pinene

(C) Camphor

(D) Terpineol

71. Wagner's reagent is :

(A) Potassium mercuric iodide

(B) lodine dissolved in potassium iodide

(C) Potassium bismith iodide

(D) Potassium sulphur iodide

72. Atropic acid on oxidation with $KMnO_4$ gives :

(A) Benzoic acid

(B) Formic acid

(C) Tropinic acid

(D) Tropic acid

73. Geraniol on cyclisation with dil. H_2SO_4 gives :

(A) p-cymené

(B) -terpineol

(C) Isoprene

(D) α-pinene

74. On hydrolysis atropine gives :

(A) Atropic acid

(B) Tropic acid + Tropine

(C) Phenyl acetic acid + HCHO

(D) Tropic acid + HCHO

75. The prostaglandins PGE2 and PGF2 are involved in :

(A) Inflammation

(B) Intoxication

(C) Excitation

(D) Neurotoxicity

76. 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) $C_{18}H_{20}O_3N$

77. Which alkaloid is used extensively in opthalmic practice ?

(A) Atropine

(B) Quinine

(C) Nicotine

(D) Morphine

78. Cis-isomer of citeral is known as :

(A) Geranial

(B) Nerol

(C) ± menthol

(D) *p*-cymene

79. Which of the following is most stable type of Prostaglandins ?

(A) A

(B) O

(C) D

(D) F

80. Alkaloids with Mayer's test gives :

(A) green colour

(B) red colour

(C) cream and pale yellow

(D) violet colour

81. The oxidation state of iron in methemoglobin is :

(A) 3

(B) 2

(C) 4

(D) Zero

82. Citral is chemically a/an :

(A) Ketone

(B) Aldehyde

(C) Alcohol

(D) Ester

83. Which one of the following is *not* considered as an alkaloid ?

(A) Nicotine

(B) Ephedrine

(C) Zinziberene

(D) Quinine

84. Carotenoids are mainly responsible for :

(A) Green color of plants

(B) Yellow and orange pigments

(C) Blue pigments

(D) White pigments

85. Ephedrine belongs to which class of alkaloids ?

(A) True alkaloids

(B) Protoalkaloids

(C) Pseudoalkaloids

(D) Indole alkaloids

86. 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

87. 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

88. Zingiberene is present in :

(A) Terpentine oil

(B) Ginger oil

(C) Rose oil

(D) Geranium oil

89. The highest level of protein structure seen in myoglobin is :

(A) Primary

(B) Secondary

(C) Tertiary

(D) Quaternary

90. Quinine is mainly used for the treatment of :

(A) Tuberculosis

(B) Malaria

(C) Diabetes

(D) Hypertension

91. Which enzyme is produced by liver ?

(A) Alkaline phosphate

(B) Alanine transminase

(C) Asparate transminase

(D) All of the above

92. Bile acids are derived from :

(A) Cholesterol

(B) Glucose

(C) Protein

(D) Fatty acids

93. 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

94. Which one of the following terpenes is a cyclic terpene ?

(A) Mycrene

(B) Limonene

(C) Natural rubber

(D) Squalene

95. Hormones :

(A) act as coenzyme

(B) act as enzyme

(C) influence synthesis of enzymes

(D) belong to B-complex

96. Which alkaloid contains two benzene rings and an isoquinoline nucleus ?

(A) Papaverine

(B) Nicotine

(C) Caffeine

(D) Quinine

97. The antimalaria drug is :

(A) Nicotine

(B) Cocaine

(C) Meroquinene

(D) Quinine

98. Which of the following form of iron is present in heme ?

(A) Ferrous form

(B) Ferric form

(C) Sodium

(D) Potassium

99. A characteristic structural feature of pyrethroids is the presence of :

(A) Cyclopropane ring

(B) Benzene ring only

(C) Pyridine ring

(D) Pyrrole ring

100. Rotenone acts by inhibiting :

(A) Photosynthesis

(B) Cellular respiration

(C) Protein synthesis

(D) DNA replication

(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।