

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Test Booklet No. :

00257 TEST BOOKLET

CHEMISTRY AND GENERAL STUDIES

Series



Time Allowed : 2 Hours

Full Marks : 200

Read the following instructions carefully before you begin to answer the questions :

1. The name of the Subject, Roll Number as mentioned in the Admission Certificate, Test Booklet No. and Series are to be written legibly and correctly in the space provided on the Answer-Sheet with Black/Blue ballpoint pen.
2. **Answer-Sheet without marking Series as mentioned above in the space provided for in the Answer-Sheet shall not be evaluated.**
3. All questions carry equal marks.

The Answer-Sheet should be submitted to the Invigilator.

Directions for giving the answers : Directions for answering questions have already been issued to the respective candidates in the 'Instructions for marking in the OMR Answer-Sheet' along with the Admit Card and Specimen Copy of the OMR Answer-Sheet.

Example :

Suppose the following question is asked :

The capital of Bangladesh is

- (A) Chennai
(B) London
(C) Dhaka
(D) Dhubri

You will have four alternatives in the Answer-Sheet for your response corresponding to each question of the Test Booklet as below :



In the above illustration, if your chosen response is alternative (C), i.e., Dhaka, then the same should be marked on the Answer-Sheet by blackening the relevant circle with a Black/Blue ballpoint pen only as below :

**The example shown above is the only correct method of answering.**

4. Use of eraser, blade, chemical whitener fluid to rectify any response is prohibited.
5. Please ensure that the Test Booklet has the required number of pages (16) and 100 questions immediately after opening the Booklet. In case of any discrepancy, please report the same to the Invigilator.
6. No candidate shall be admitted to the Examination Hall/Room 20 minutes after the commencement of the examination.
7. **No candidate shall leave the Examination Hall/Room** without prior permission of the Supervisor/Invigilator. No candidate shall be permitted to hand over his/her Answer-Sheet and leave the Examination Hall/Room before expiry of the full time allotted for each paper.
8. No Mobile Phone, Electronic Communication Device, etc., are allowed to be carried inside the Examination Hall/Room by the candidates. Any Mobile Phone, Electronic Communication Device, etc., found in possession of the candidate inside the Examination Hall/Room, even if on off mode, shall be liable for confiscation.
9. No candidate shall have in his/her possession inside the Examination Hall/Room any book, notebook or loose paper, except his/her Admission Certificate and other connected papers permitted by the Commission.
10. Complete silence must be observed in the Examination Hall/Room. No candidate shall copy from the paper of any other candidate, or permit his/her own paper to be copied, or give, or attempt to give, or obtain, or attempt to obtain irregular assistance of any kind.
11. This Test Booklet can be carried with you after answering the questions in the prescribed Answer-Sheet.
12. Noncompliance with any of the above instructions will render a candidate liable to penalty as may be deemed fit.
13. No rough work is to be done on the OMR Answer-Sheet. You can do the rough work on the space provided in the Test Booklet.

N.B. : There will be negative marking @ 0.25 per 1 (one) mark against each wrong answer.

/62-A

[No. of Questions : 100]

SEAL

1. Which one of the following materials is used for the control rods in uranium reactors?
- (A) Boron
(B) Antimony
(C) Carbon steel
(D) Titanium
2. Which of the following is an example of amphoteric oxide?
- (A) Al_2O_3
(B) CO_2
(C) Na_2O
(D) MgO
3. 2-Electron, 3-centre bond is found in
- (A) H_2O
(B) BCl_3
(C) $\text{Al}_2(\text{CH}_3)_6$
(D) NH_3
4. Which of the following has the highest priority according to the Cahn-Ingold-Prelog sequence rules?
- (A) CH_2Cl
(B) CH_3
(C) CHO
(D) CH_2OH
5. Which of the following materials is used in high-tech racing automotive cars?
- (A) Carbotanium—carbon-titanium
(B) Silicon carbide with carbon fibre
(C) Pure carbon-carbon
(D) Graphite
6. Which of the following is the most reactive as a nucleophile?
- (A) PhO^-
(B) PhS^-
(C) PhCH_2O^-
(D) PhCH_2NH_2
7. Quartz is a form of
- (A) Al_2O_3
(B) SiO_2
(C) MgO
(D) CaCO_3
8. Borazine is also known as
- (A) inorganic xylene
(B) inorganic benzene
(C) organic benzene
(D) organic xylene
9. Lithium is the strongest reducing agent among the alkali metals. The reason behind it is its high
- (A) ionization energy
(B) electron affinity
(C) lattice energy
(D) hydration energy

10. Which compound is most acidic?
- (A) CH_4
 - (B) C_2H_6
 - (C) $\text{CH}\equiv\text{CH}$
 - (D) $\text{C}_2\text{H}_5\text{OH}$
11. Ultraviolet region spectrum falls under the range of
- (A) 180–400 nm
 - (B) 400–800 nm
 - (C) 800–1200 nm
 - (D) 1200–1600 nm
12. Which of the following lamps is used as the IR radiation source?
- (A) Nernst glower
 - (B) Deuterium lamp
 - (C) Tungsten lamp
 - (D) Xenon lamp
13. Fingerprint region in IR spectroscopy falls under the range of
- (A) $1600\text{--}800\text{ cm}^{-1}$
 - (B) $1500\text{--}800\text{ cm}^{-1}$
 - (C) $1200\text{--}600\text{ cm}^{-1}$
 - (D) $1000\text{--}500\text{ cm}^{-1}$
14. Amine compounds have infrared absorption region in the frequency range of
- (A) $600\text{--}1500\text{ cm}^{-1}$
 - (B) $1000\text{--}1300\text{ cm}^{-1}$
 - (C) $2500\text{--}3000\text{ cm}^{-1}$
 - (D) $3300\text{--}3500\text{ cm}^{-1}$
15. Which of the following is **not** a detector used in UV-Vis spectrophotometer?
- (A) Photomultiplier tube
 - (B) Diode array detector
 - (C) Phototube
 - (D) Thermal capture detector
16. Geiger-Muller counter is used for the measurement of which radiation?
- (A) Gamma radiation
 - (B) UV radiation
 - (C) Microwave radiation
 - (D) IR radiation
17. Beer-Lambert law is the principle of which of the following spectroscopies?
- (A) IR spectroscopy
 - (B) UV-Vis spectroscopy
 - (C) Fluorescence spectroscopy
 - (D) Surface plasmon resonance spectroscopy

18. Which of the following techniques works on the Henry's gas law?
- (A) GC-MS
 - (B) HS-GC
 - (C) LC-MS
 - (D) FT-IR
19. In silica gel G, what does G mean?
- (A) Granular
 - (B) Gallatin
 - (C) Gypsum
 - (D) Gallic acid
20. Which of the following is **not** an X-ray diffraction method?
- (A) Laue photographic method
 - (B) Bragg X-ray spectrometer method
 - (C) Rotating crystal method
 - (D) Splitless method
21. 'Hooch poisoning' is associated with which type of alcohol?
- (A) Ethanol
 - (B) Methanol
 - (C) Isoamyl alcohol
 - (D) Ethylene glycol
22. Using iodoform test, which colour is produced with a positive reaction?
- (A) Green
 - (B) Yellow
 - (C) White
 - (D) Black
23. Pyknometer is used for the measurement of
- (A) temperature
 - (B) specific gravity
 - (C) volatility
 - (D) flash point
24. Phenolphthalein gives which colour in $\text{pH} > 8.5$?
- (A) Orange
 - (B) White
 - (C) Pink
 - (D) Black
25. Which of the following is a high explosive?
- (A) Black powder
 - (B) TNT
 - (C) Potassium nitrate
 - (D) Barium nitrate

26. The flash point of typical standard diesel is
- (A) 30–35 °C
 - (B) 35–40 °C
 - (C) 40–45 °C
 - (D) 45–50 °C
27. In bribe trap cases, which standard dye is used?
- (A) Congo red
 - (B) Phenolphthalein
 - (C) Thioflavin T
 - (D) Neon 80
28. TNT explosive's chemical name is
- (A) trinitrotoluene
 - (B) tetranitrotoluene
 - (C) trinitrotungsten
 - (D) trinitrothionyl
29. Which of the following explosives is also known as 'hexogen'?
- (A) Tetryl
 - (B) PETN
 - (C) RDX
 - (D) TNT
30. Griess test is performed for the detection of the presence of
- (A) nitrite
 - (B) borate
 - (C) zinc
 - (D) arsenic
31. Which Act describes about prohibition on narcotic and psychotropic substances?
- (A) The Poisons Act, 1919
 - (B) The Pharmacy Act, 1948
 - (C) The Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954
 - (D) The NDPS Act, 1985
32. Which of the following nations is **not** a part of Golden Crescent?
- (A) Afghanistan
 - (B) Pakistan
 - (C) Iran
 - (D) Sri Lanka
33. Which of the following is 'diacetylmorphine'?
- (A) Cocaine
 - (B) Morphine
 - (C) Heroin
 - (D) Ganja

34. From which part of the poppy plant, opium is collected?
- (A) Seeds
 - (B) Roots
 - (C) Stem
 - (D) Pods
35. For the detection of cocaine, which of the following chemical tests is used?
- (A) Fujiwara test
 - (B) Scott test
 - (C) Dille-Koppanyi test
 - (D) Marquis test
36. Ganja is obtained from which of the following plants?
- (A) *Erythroxylum coca*
 - (B) *Cannabis indica*
 - (C) *Calotropis gigantea*
 - (D) *Chondrodendron tomentosum*
37. Which of the following drugs is known as 'ecstasy'?
- (A) Methamphetamine
 - (B) Methaqualone
 - (C) Mefenamic acid
 - (D) Metronidazole
38. Fast Blue B test is generally used for the detection of which narcotic substance?
- (A) Heroin
 - (B) Cannabis
 - (C) Cocaine
 - (D) LSD
39. By using chromogenic reagent, Charas gives which of the following colours?
- (A) Blue
 - (B) Green
 - (C) Yellow
 - (D) Violet
40. For the analysis of cocaine by using HPLC, which wavelength is used in UV detector?
- (A) 400 nm
 - (B) 280 nm
 - (C) 230 nm
 - (D) 330 nm
41. 'King of Poisons' nickname is used for which of the following poisons?
- (A) Thallium
 - (B) Arsenic
 - (C) Lead
 - (D) Mercury
42. Who wrote the famous book, *Traité Des Poisons*?
- (A) Mathieu Orfila
 - (B) Paracelsus
 - (C) Alphonse Bertillon
 - (D) Jonathan Black

43. Steam distillation method is used for the extraction of which poison?
- (A) Datura
 - (B) Parathion
 - (C) Methanol
 - (D) Diazepam
44. Which of the following poisons is a rodenticide?
- (A) Monocrotophos
 - (B) Parathion
 - (C) Cyanide
 - (D) Zinc phosphide
45. Glucuronidation is a part of which phase of metabolism?
- (A) Phase 0
 - (B) Phase 1
 - (C) Phase 2
 - (D) Phase 3
46. Stas-Otto method is used for the extraction of which poison?
- (A) Organic volatile poison
 - (B) Organic non-volatile poison
 - (C) Inorganic non-volatile poison
 - (D) Acidic poison
47. Trinder's test is performed for the detection of which of the following drugs?
- (A) Diazepam
 - (B) Acetyl salicylic acid
 - (C) Phenobarbitone
 - (D) Metoprolol
48. Which of the following is an antidote in the case of cyanide poisoning?
- (A) Sodium thiosulphate
 - (B) Succimer
 - (C) Penicillamine
 - (D) Charcoal
49. Liquid-liquid extraction method works on the principle of
- (A) partial pressure
 - (B) immiscibility
 - (C) volatility
 - (D) cohesivity
50. Cherry red colour of postmortem lividity is seen under which poisoning?
- (A) Hydrogen sulphide
 - (B) Sodium nitrate
 - (C) Carbon dioxide
 - (D) Carbon monoxide

51. The joint sitting of the Parliament of India is presided over by the
- (A) Vice President of India
 - (B) Speaker of the Lok Sabha
 - (C) Chairman of the Rajya Sabha
 - (D) Deputy Speaker of the Lok Sabha
52. Badan Barphukan was the Governor of
- (A) Sadiya
 - (B) Solal
 - (C) Marangi
 - (D) Kamrup
53. The National Green Hydrogen Mission is an initiative of the
- (A) Ministry of New and Renewable Energy
 - (B) Ministry of Environment, Forest and Climate Change
 - (C) Ministry of Power
 - (D) Ministry of Science and Technology
54. The oldest paramilitary force in India is
- (A) the Assam Rifles
 - (B) the Central Reserve Police Force
 - (C) the Border Security Force
 - (D) the Indo-Tibetan Border Police
55. Sheetal Devi received the Arjuna Award, 2023 for
- (A) para-canoeing
 - (B) para-archery
 - (C) para-athletics
 - (D) para-badminton
56. Who speculated that the universe is expanding?
- (A) Isaac Newton
 - (B) Galileo Galilei
 - (C) Nicolaus Copernicus
 - (D) Edwin Hubble
57. Which Veda provides information about the civilization of early Vedic period?
- (A) *Yajurveda*
 - (B) *Samaveda*
 - (C) *Rigveda*
 - (D) *Atharvaveda*

58. The Miyawaki method is well-known for
- (A) the promotion of commercial farming in arid areas
 - (B) the development of gardens using genetically modified flora
 - (C) the creation of mini forests in urban areas
 - (D) harvesting wind energy in coastal areas
59. The soils which are rich in calcium are known as
- (A) pedocals
 - (B) pedalfers
 - (C) podzols
 - (D) laterites
60. The Lithium Triangle involves which of the following countries?
- (A) Myanmar–Laos–Thailand
 - (B) Afghanistan–Pakistan–Iran
 - (C) Mexico–Brazil–Colombia
 - (D) Argentina–Bolivia–Chile
61. Who has the authority to decide in the event of dispute in election of the President of India?
- (A) The Election Commission
 - (B) The Supreme Court
 - (C) The Prime Minister
 - (D) The Lok Sabha
62. INSAT-3DS, launched by ISRO, is what kind of satellite?
- (A) Meteorological
 - (B) Geostationary
 - (C) Communication
 - (D) Earth observation
63. Which movie is the first colour movie of India?
- (A) *Alam Ara*
 - (B) *Mughal-e-Azam*
 - (C) *Bombay Talkies*
 - (D) *Kisan Kanya*
64. Pandit Birju Maharaj was associated with the dance form
- (A) Kathakali
 - (B) Kuchipudi
 - (C) Kathak
 - (D) Mohiniattam

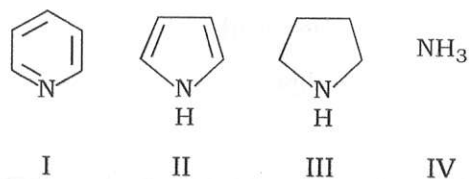
65. Which of the following diseases has been officially recognized by WHO as a tropical disease?
- (A) Covid-19
 - (B) Lumpy skin disease
 - (C) Noma
 - (D) TB
66. What is the primary objective of the PM Vishwakarma Yojana?
- (A) Promoting industrial development in rural areas
 - (B) Facilitating modern technology adoption for traditional crafts people
 - (C) Creating job opportunities in service sector
 - (D) Supporting agricultural innovation
67. *Naam Ghosa* was written by
- (A) Sankardev
 - (B) Madhavdev
 - (C) Madhava Kandali
 - (D) Damodardev
68. What type of software is Google Chrome?
- (A) Word processing
 - (B) Video editing
 - (C) Spreadsheet
 - (D) Web browser
69. Among the following countries, which country is **not** a member of BRICS?
- (A) Argentina
 - (B) Brazil
 - (C) India
 - (D) China
70. Artificial Intelligence is about
- (A) playing a game on computer
 - (B) making a machine intelligent
 - (C) programming on machine with your own intelligence
 - (D) putting your intelligence in machine

71. If a semiconductor is cooled, then its resistance will
- (A) increase
- (B) decrease
- (C) remain same
- (D) first increase then decrease

72. Which one of the following is expected to exhibit diamagnetic behaviour?

- (A) O_2
- (B) N_2^+
- (C) C_2
- (D) S_2

73. The correct basicity order for the following compounds is



- (A) $IV > II > I > III$
- (B) $III > IV > I > II$
- (C) $I > IV > III > II$
- (D) $III > I > II > IV$

74. The resistance of a circular wire is R . If its radius is halved and length is reduced to $\frac{1}{4}$ th of its original length, the resistance will become

- (A) $\frac{1}{2}R$
- (B) $\frac{1}{3}R$
- (C) $\frac{2}{3}R$
- (D) R

75. Which of the following is **not** a functional isomer of C_3H_6O ?

- (A) Prop-2-en-1-ol
- (B) 1,2-Epoxypropane
- (C) Propan-1-ol
- (D) Propan-2-one

76. Five horses are in a race. Mr. A selects two of the horses at random and bets on them. The probability that Mr. A selected the winning horse is

- (A) $\frac{4}{5}$
- (B) $\frac{3}{5}$
- (C) $\frac{1}{5}$
- (D) $\frac{2}{5}$

77. The dimensional formula of potential gradient is
- (A) MLT^{-2}
 - (B) MLT^{-3}
 - (C) $ML^{-1}T^{-1}$
 - (D) $ML^{-1}T^{-2}$
78. Ribosomes are sites for
- (A) photosynthesis
 - (B) respiration
 - (C) protein synthesis
 - (D) fat synthesis
79. Which of the following organisms breathes from skin?
- (A) Snake
 - (B) Earthworm
 - (C) Monkey
 - (D) Human
80. Lysosomes are produced by which of the following cell organelles?
- (A) Golgi complex
 - (B) Mitochondria
 - (C) Endoplasmic reticulum
 - (D) DNA
81. Which one of the following pairs is correctly matched?
- (A) Scurvy—Thiamine
 - (B) Tuberculosis—ATS
 - (C) Tetanus—BCG
 - (D) Malaria—Chloroquine
82. The compressibility factor for a real gas at high pressure is
- (A) $1 + \frac{RT}{pb}$
 - (B) 1
 - (C) $1 + \frac{pb}{RT}$
 - (D) $1 - \frac{pb}{RT}$
83. Which of the following types of microorganisms is photosynthetic?
- (A) Yeast
 - (B) Virus
 - (C) Helminth
 - (D) Alga
84. After four cycles of PCR, how many DNA duplexes can be produced from one DNA duplex?
- (A) 4
 - (B) 8
 - (C) 16
 - (D) 32

85. The image formed by concave mirror is real, inverted and of the same size as that of the object. The position of the object should be
- (A) at the focus
 (B) at the centre of curvature
 (C) between the focus and the centre of curvature
 (D) beyond the centre of curvature
86. Which substance is used to determine the hardness of water using a simple titration?
- (A) Mg (EDTA)
 (B) Na₂ (EDTA)
 (C) Fe (EDTA)
 (D) Co (EDTA)
87. For a reaction $\frac{1}{2}A \longrightarrow 2B$, the rate of disappearance of A is related to the rate of appearance of B by
- (A) $-\frac{d[A]}{dt} = \frac{1}{2} \frac{d[B]}{dt}$
 (B) $-\frac{d[A]}{dt} = \frac{1}{4} \frac{d[B]}{dt}$
 (C) $-\frac{d[A]}{dt} = \frac{d[B]}{dt}$
 (D) $-\frac{d[A]}{dt} = 4 \frac{d[B]}{dt}$
88. Two resistances are in the ratio 1 : 4. If these are connected in parallel, their total resistance becomes 20 Ω. The values of the resistances are
- (A) 25 Ω and 100 Ω
 (B) 27 Ω and 10 Ω
 (C) 30 Ω and 100 Ω
 (D) 100 Ω and 10 Ω
89. Producer gas is a mixture of
- (A) CO₂ and H₂
 (B) CO and H₂
 (C) CO and N₂
 (D) CO₂ and N₂
90. Among the following, which one is the start codon?
- (A) AUG
 (B) UAA
 (C) UAG
 (D) UGA

91. Choose the synonym for the word 'Sovereign'.

- (A) Immunity
- (B) Feudatory
- (C) Subservient
- (D) Independent

92. Find the suitable antonym for the word 'Important'.

- (A) Meaningful
- (B) Irrelevant
- (C) Bellicose
- (D) Harmonic

93. Fill in the blank :

I met a patient at the _____ stage of his illness.

- (A) transmitted
- (B) main
- (C) terminal
- (D) unstoppable

94. Choose the correct passive form of the given sentence :

She wrote a letter in verse form to her friend.

- (A) A verse in letter form has been written by her to her friend.
- (B) A letter in verse form was being written by her to her friend.
- (C) A letter in verse form was written by her to her friend.
- (D) A letter in verse form has been written by her to her friend.

95. Select the most appropriate option to substitute the underlined segment in the given sentence :

I try to solve this problem at least for two hours.

- (A) have been trying to solve
- (B) am try to solve
- (C) was being trying to solve
- (D) tried to be solving

96. Improve the bracketed part of the sentence :

The Hon'ble Court noted that the driver of the (offend) vehicle did not carry any evidence in rebuttal of the claims.

- (A) offended
- (B) offencing
- (C) offending
- (D) offence

97. Identify the correct sentence.

- (A) Me and Sangita are going to the movies.
- (B) Sangita and I are going to the movies.
- (C) Me and Sangita is going to the movies.
- (D) Sangita and me are going to the movies.

98. Identify the sentence with the correct punctuation.

- (A) Can I go home, if I finish my work.
- (B) Can I go home if I finish my work?
- (C) Can I go home; if I finish my work?
- (D) Can I go home if I finish my work.

99. Which word is a conjunction in the given sentence?

She will arrive late, but she will come.

- (A) late
- (B) come
- (C) will
- (D) but

100. Choose the appropriate indirect speech of the given sentence :

Priya said, "I am going to college just now."

- (A) Priya said that she was going to college just now.
- (B) Priya asked that she was going to college just then.
- (C) Priya said that she was going to college just then.
- (D) Priya asked that she was going to college just now.

SPACE FOR ROUGH WORK

SEAL

JSOMFL/CHE/24/62-A

16

24T—155×4