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Booklet No.

40421

## QUESTION BOOKLET

Booklet Series



## PHARMACEUTICAL CHEMISTRY

Subject Code : 04

Time Allowed : 2 Hours

Maximum Marks : 100

### INSTRUCTIONS FOR CANDIDATES

1. Immediately after the commencement of the Examination you should check that this Question Booklet **does not have any unprinted or torn or missing pages or items etc.** If so, get it replaced by a complete Question Booklet.
2. You have to enter your Roll Number on the Question Booklet in the Box provided alongside. **DO NOT** write anything else on the Question Booklet. 

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3. Candidate must fill in the necessary information in the space provided on the supplied OMR (Optical Mark Recognition) Answer Sheet before commencement of the Examination. See directions on the backside of the OMR Answer Sheet.
4. For marking the correct answer, darken **one** circle by **black** or **blue** ballpoint pen only. **Do not mark on more than one circle.** Darkening more than one circle against an answer will be treated as wrong answer.
5. Do not detach any leaf from this Question Booklet. After the Examination, **hand over the OMR Answer Sheet to the Room Invigilator.** You are allowed to take the Question Booklet after the Examination is over.
6. This Booklet contains **100 questions.** Each question carries **1 mark.** There is no negative marking for any wrong answer.
7. Possession and **use of Calculator, Mobile Phone or similar Electronic Devices is prohibited** in the Examination Hall.
8. Candidates are informed that evaluation of the OMR Answer Sheet will be done by Electronic Machine. So, they should shadow the bubbles of Roll No., Centre Code, Subject Code, Booklet Series and Booklet No. properly, otherwise Machine will not be able to evaluate it. Failure to comply this instruction will be the sole responsibility of the candidate.
9. Candidates appearing in the Examination will be allowed to leave the Examination Hall only after completion of the Examination.

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SEAL

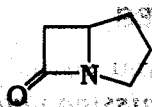
1. 17  $\beta$ -hydroxy, androst-4-ene-3-one is an IUPAC name of

- (A) progesterone
- (B) testosterone
- (C) cortisone
- (D) estrone

4. Trimethoprim contains

- (A) pyrimidine nucleus and 2,4,6-trimethoxy benzyl substitution
- (B) pyridine nucleus and 2,4,6-trimethoxy benzyl substitution
- (C) pyrimidine nucleus and 3,4,5-trimethoxy benzyl substitution
- (D) pyridine nucleus and 3,4,5-trimethoxy benzyl substitution

2. Identify the ring given below :



- (A) Cepham
- (B) Penam
- (C) Carbapenam
- (D) Carbapenem

5. Mefenamic acid is a derivative of

- (A) aryl propionic acid
- (B) aryl acetic acid
- (C) anthranilic acid
- (D) None of the above

3. In the glucuronide conjugation reaction of meprobamate, the functional group responsible is

- (A) hydroxy
- (B) carboxyl
- (C) amide
- (D) thiol

6. Saccharimetry is the practical application of

- (A) potentiometry
- (B) polarimetry
- (C) aquametry
- (D) acidimetry

7. In which of the following titrations, oxidation-reduction (redox) step can be expected?
- (A) Aquametry
  - (B) Cerimetry
  - (C) Gay-Lussac method
  - (D) Kjeldahl titration
8. Assay of calcium gluconate is performed by
- (A) direct titration
  - (B) indirect titration
  - (C) alkalimetric titration
  - (D) replacement titration
9. Oxazepam is a metabolite of
- (A) diazepam
  - (B) temazepam
  - (C) Both (A) and (B)
  - (D) None of the above
10. Antibiotic streptomycin acts by
- (A) inhibition of protein synthesis by binding with 30S ribosomal unit
  - (B) inhibition of protein synthesis by binding with 50S ribosomal unit
  - (C) inhibition of cell wall synthesis
  - (D) inhibition of DNA gyrase
11. Which one of the following is a selective COX-2 inhibitor?
- (A) Piroxicam
  - (B) Valdecoxib
  - (C) Aspirin
  - (D) Thioridazine
12. Because of bitter taste, chloramphenicol is available in which of the following salts for pediatric usage?
- (A) Phosphate
  - (B) Palmitate
  - (C) Hydrochloride
  - (D) Fumarate
13. Which of the following is an example of prodrug?
- (A) Phenothiazine
  - (B) Ibuprofen
  - (C) Enalapril
  - (D) INH
14. Which of the following is anti-metabolite drug having anti-fungal activity?
- (A) Clotrimazole
  - (B) Flucytosine
  - (C) Griseofulvin
  - (D) Terbinafine

15. Stavudine is an example of

- (A) non-nucleoside pyrimidine analogue
- (B) nucleoside pyrimidine analogue
- (C) nucleoside pyridine analogue
- (D) nucleoside deoxypurine analogue

16. Amodiaquine structure is a derivative of

- (A) 4-aminoquinoline with *N*-phenyl substitution
- (B) 3-aminoquinoline with *N*-phenyl substitution
- (C) 4-aminoquinoline with pyridazine substitution
- (D) 3-aminoquinoline with pyridazine substitution

17. Higher the dielectric constant

- (A) lower will be the dissociation of solute
- (B) higher will be the dissociation of solute
- (C) ion pairing occurs
- (D) Both (A) and (C)

18. Oxygen flask combustion method was developed by

- (A) K. Fajan
- (B) Kjeldahl
- (C) Schoriger
- (D) None of the above

19. Which of the following drugs belongs to nitrosourea class?

- (A) Streptozocin
- (B) Dacarbazine
- (C) Estramustine
- (D) Nitazoxanide

20. Which of the following is non-steroidal drug having potent oestrogenic activity?

- (A) *cis*-Diethylstilbestrol
- (B) *trans*-Diethylstilbestrol
- (C) Triamcinolone
- (D) Auranofin

21. The metabolism of diazepam occurs by

- (A) *N*-dealkylation
- (B) hydroxylation
- (C) Both (A) and (B)
- (D) None of the above

22. Which of the following is an antifungal antibiotic?

- (A) Erythromycin
- (B) Rifampin
- (C) Cycloserine
- (D) Natamycin

23. The active metabolite of anti-cancer cyclophosphamide is

- (A) 4-hydroxy  
cyclophosphamide
- (B) N-acetyl cyclophosphamide
- (C) N-hydroxy  
cyclophosphamide
- (D) N-hydroxymethyl  
cyclophosphamide

24. Absolute stereochemistry is represented by

- (A) D and L
- (B) d and L
- (C) R and S
- (D) All of the above

25. Sulphonamide not having anti-diabetic activity is

- (A) tolbutamide
- (B) acetohexamide
- (C) mafenide
- (D) chlorpropamide

26. Duration of action of insulin may be prolonged by

- (A) esterification of amino acid residue
- (B) forming complex of insulin with protein
- (C) binding with acidic resins
- (D) None of the above

27. How many chiral centres are present in steroid nucleus?

- (A) 6
- (B) 4
- (C) 5
- (D) 7

28. A prodrug used in the treatment of parkinsonism is

- (A) levodopa
- (B) carbidopa
- (C) selegiline
- (D) bromocriptine

29. The vitamin administered with isoniazid to minimize its adverse reaction is

- (A) pyridoxine
- (B) niacin
- (C) thiamine
- (D) biotin

**30. Antihypertensive agent terazosin contains**

- (A) quinazoline and pyran ring
- (B) quinazoline and piperazine ring
- (C) quinoline and piperazine ring
- (D) quinoline and triazole ring

**31. Clavulanic acid has a beta lactum ring fused to**

- (A) thiadiazole system
- (B) thiazolidine system
- (C) oxazolidine system
- (D) thiazole system

**32. Which of the following steroids shows predominant mineralocorticoid action?**

- (A) Dexamethasone
- (B) Prednisolone
- (C) Triamcinolone
- (D) Fludrocortisone

**33. Benzodiazepines potentiate the**

- (A) binding of proteins to nervous tissue
- (B) binding of GABA to receptors
- (C) binding of GABA to carbohydrates
- (D) binding of GABA to lipids

**34. Which antineoplastic agent is metabolized by xanthine oxidase?**

- (A) 6-Thioguanine
- (B) Vincristine
- (C) 6-Mercaptopurine
- (D) Doxorubicin

**35. An anticholine esterase inhibitor useful in Alzheimer's disease is**

- (A) isoproterenol
- (B) clioquinol
- (C) donepezil
- (D) arecoline

**36. Correct unit of wave number is**

- (A) cm
- (B)  $m^{-1}$
- (C)  $cm^{-1}$
- (D)  $cm^{-2}$

37. Radiations which have enough energy to cause transitions of the outermost electrons are
- UV-visible
  - X-ray
  - IR
  - NMR
38. Which of the following is the bulk property detector?
- Diode array detector
  - UV detector
  - Fluorescence detector
  - Refractive index detector
39. The efficiency of chromatographic column is measured by
- its length
  - HETP
  - number of theoretical plates
  - None of the above
40. Diatomic molecule absorbed in IR region is
- H<sub>2</sub>
  - O<sub>2</sub>
  - N<sub>2</sub>
  - HCl
41. Choose the correct statement for monobasic acids and monoacidic bases.
- Molar and normal solutions are identical in concentration
  - Molar and normal solutions are not identical in concentration
  - Concentration of molar solution is double of normal solution
  - Concentration of normal solution is double of molar solution
42. In the treatment of angina, verapamil acts as
- $\beta$ -blocker
  - calcium channel blocker
  - vasodilator
  - platelets aggregation inhibitor
43. Naloxone is
- pure opioid antagonist and is *N*-allyl derivative of dihydromorphine
  - pure opioid antagonist and is *N*-allylnormorphine
  - partial opioid antagonist and is *N*-allylnormorphine
  - less active than nalorphine as morphine antagonist

44. Drug not having phenylethylamine moiety is

- (A) amphetamine
- (B) pheniramine
- (C) glyburide
- (D) mescaline

45. Which structural feature is common in atenolol, propranolol and sotalol?

- (A) 1-Methylethyl amino
- (B) 2-Hydroxyethyl amino
- (C) 1-Propyl amino
- (D) None of the above

46. Which of the following is an example of polypeptide antibiotic?

- (A) Neomycin
- (B) Bacitracin
- (C) Amikacin
- (D) Clindamycin

47. Antacid acts

- (A) by decreasing the volume of HCl in stomach
- (B) by neutralizing the gastric HCl contents
- (C) through H/K ATPase pump
- (D) All of the above

48. The Sodium Rose Bengal (I-131) is used in

- (A) study of potassium ion exchange
- (B) plasma volume determination
- (C) brain scanning
- (D) liver function determination

49. Which one of the following is used as systemic alkalizer?

- (A) Sodium chloride
- (B) Sodium bicarbonate
- (C) Sodium sulphate
- (D) Sodium acetate

50. Which of the following is inorganic saline expectorant?

- (A) Ammonium chloride
- (B) Potassium iodide
- (C) Potassium guaiacolsulfonate
- (D) All of the above

51. Uric acid stone formation can be reduced by

- (A) acidification of urine
- (B) alkalinization of urine
- (C) acidification of serum
- (D) alkalinization of serum

52. Consumption of raw egg can cause deficiency of

- (A) riboflavin
- (B) pyridoxine
- (C) biotin
- (D) cyanocobalamin

53. This makes a compound to act as a central sympathomimetic agent

- (A) Introduction of beta hydroxyl group in phenylethylamine
- (B) Branching with lower alkyl group on alfa carbon of phenylethylamine
- (C) Halogenations of aromatic ring of phenylethylamine
- (D) Methoxy substitution of aromatic ring of phenylethylamine

54. Which one of the following is non-depolarizing neuromuscular blocking agent?

- (A) Succinylcholine chloride
- (B) *d*-Tubocurarine
- (C) Decamethonium
- (D) Scopolamine hydrobromide

55. Which one of the following diuretics is devoid of adverse effects related to sulphamoyl moiety?

- (A) Spironolactone
- (B) Azosemide
- (C) Acetazolamide
- (D) Hydrochlorothiazide

56. The energy is inversely proportional to

- (A) frequency
- (B) wavelength
- (C) Both (A) and (B)
- (D) None of the above

57. Which one of the following parts is used to isolate particular wavelength or range of wavelengths?

- (A) Radiation source
- (B) Detector
- (C) Monochromator
- (D) All of the above

58. Chemical shift is denoted by

- (A)  $\nu$
- (B)  $\sigma$
- (C)  $\eta$
- (D)  $\delta$

59. Which one of the following standard references is used in NMR universally?

- (A) Benzene
- (B) Chloroform
- (C) TMS
- (D) None of the above

60. The mass analyzer separates the sample ions based on their

- (A) mass to charge ratio
- (B) mass to temperature ratio
- (C) mass to velocity ratio
- (D) mass to ions ratio

61. MALDI is

- (A) matrix-assisted lower desorption ionization
- (B) matrix-assisted laser desorption ionization
- (C) mass-assisted laser desorption ionization
- (D) mass-assisted laser design ionization

62. In adsorption chromatography, the stationary phase is

- (A) liquid
- (B) gas
- (C) solid
- (D) All of the above

63. In Van Deemter equation

$$(HETP = A + B/\mu + C\mu)$$

the term A is

- (A) molecular diffusion
- (B) eddy diffusion
- (C) mass transfer
- (D) None of the above

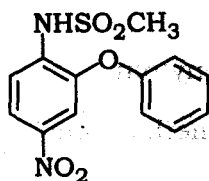
64. Which of the following is not acting as antimetabolite?

- (A) 6-Thioguanine
- (B) 6-Mercaptopurine
- (C) Clofibrate
- (D) Methotrexate

65. Chlorpromazine structure contains which of the following heterocycles?

- (A) Piperazine
- (B) Xanthine
- (C) Phenothiazine
- (D) Thiadiazine

66. Identify the structure given below :



(A) Sulindac

(B) Nimesulide

(C) Naproxen

(D) Benoxinate

67. Starting material for the synthesis of dacarbazine is

(A) 5-aminoimidazole-4-carboxamide

(B) 1-(2,4-dichlorobenzoyl-methyl)-imidazole

(C) 5-hydroxy-3-methyl-imidazole

(D) 4-hydroxy-2-carboxyl-imidazole

68. Clofazimine belongs to a class of

(A) iminophenazines

(B) phenothiazines

(C) pyrimidines

(D) benzotriazole

69. Ethyl derivative of 1-methyl-4-phenyl piperidine-4-carboxylic acid is

(A) anthelmintic agent

(B) narcotic analgesic

(C) nonsteroidal antiinflammatory agent

(D) antifungal agent

70. Captopril is the derivative of amino acid

(A) histidine

(B) tyrosine

(C) phenylalanine

(D) proline

71. 2,6-Dimethylaniline and chloroacetyl chloride are the starting materials for the synthesis of drug

(A) lidocaine

(B) benzocaine

(C) etidocaine

(D) mepivacaine

72. Resolution is a method to separate

(A) diastereomers

(B) enantiomers

(C) steroidal mixtures

(D) None of the above

**73.** Alfentanil is a/an

- (A) synthetic opioid analgesic agent
- (B) naturally occurring analgesic agent
- (C) COX-2 inhibitor
- (D) anilide derivative used as NSAID

**74.** Which one of the following does not contain piperidine moiety in its structure?

- (A) Mepivacaine
- (B) Ropivacaine
- (C) Lidocaine
- (D) Bupivacaine

**75.** The phenothiazine derivative used for Parkinson's disease is

- (A) prochlorperazine
- (B) promethazine
- (C) ethopropazine
- (D) chlorpromazine

**76.** Which one of the following belongs to imidazolidine 2,4-dione class?

- (A) Phenytoin
- (B) Trimethadione
- (C) Phensuximide
- (D) Paramethadione

**77.** Replacement of oxygen at C-2 of barbituric acid by a sulfur

- (A) increases lipid solubility
- (B) decreases lipid solubility
- (C) shows no change in lipid solubility
- (D) None of the above

**78.** In the limit test for sulphate, which one of the following is used to prevent supersaturation?

- (A) Barium sulphate
- (B) Potassium sulphate
- (C) Alcohol
- (D) None of the above

**79.** Which of the following is an oxidizing agent?

- (A) Hydrogen peroxide
- (B) Potassium permanganate
- (C) Concentrated nitric acid
- (D) All of the above

80. Molecule to become IR active in IR spectroscopy

- (A) must show dipole moment
- (B) must show change in dipole moment
- (C) must show magnetic moment
- (D) must show change in magnetic moment

81. Electromagnetic radiation used in NMR spectroscopy is

- (A) microwave
- (B) radiofrequency wave
- (C) ultraviolet
- (D) infrared radiation

82. Which one of the following indicators is used in complexometric titration?

- (A) Methyl orange
- (B) Murexide
- (C) Eosin
- (D) Crystal violet

83. Sulphur containing B-complex vitamin is

- (A) biotin
- (B) riboflavin
- (C) niacin
- (D) pyridoxine

84. Triamcinolone is

- (A) 9  $\alpha$ -fluoro 16  $\alpha$ -hydroxy-prednisolone
- (B) 9  $\beta$ -fluoro 16  $\alpha$ -hydroxy-prednisolone
- (C) 9  $\alpha$ -fluoro 16  $\beta$ -hydroxy-prednisolone
- (D) 9  $\beta$ -fluoro 16  $\beta$ -hydroxy-prednisolone

85. 2,6-Dimethoxyphenyl penicillin is the IUPAC name of

- (A) ampicillin
- (B) methicillin
- (C) amoxicillin
- (D) carbenicillin

86. In gel permeation chromatography, molecules are separated on the basis of their

- (A) size and shape
- (B) chemical nature
- (C) adsorptive properties
- (D) partition coefficient

87. The amperometric titration is based on the principle of

- (A) diffusion current is proportional to concentration of electroactive species
- (B) diffusion current is proportional to applied potential
- (C) half-wave potential is characteristic of the substance determined
- (D) half-wave potential is proportional to concentration of active species

88. The heterocyclic ring present in nizatidine is

- (A) imidazole
- (B) oxazole
- (C) thiazole
- (D) furan

89. The most intense peak in the mass spectrum is

- (A) mass peak
- (B) metastable peak
- (C) M+1 peak
- (D) base peak

90. Which of the following is a tartar emetic?

- (A) Potassium bitartrate
- (B) Antimony potassium tartrate
- (C) Magnesium tartrate
- (D) None of the above

91. The relationship among concentration, temperature and potential of a solution is given by

- (A) Ilkovic equation
- (B) Henderson equation
- (C) Nernst equation
- (D) Van Warmer equation

92. Tricyclic antidepressant used as antiepileptic is

- (A) carbamazepine
- (B) phenytoin
- (C) valproate
- (D) ethosuximide

93. Limit test for arsenic is performed in which of the following methods?

- (A) Dithizone test
- (B) Gutzeit test
- (C) Arsine test
- (D) None of the above

94. Which one of the following is an unsaturated fatty acid?
- (A) Linoleic acid  
(B) Myristic acid  
(C) Palmitic acid  
(D) Stearic acid
95. SGPT is elevated in
- (A) hepatitis  
(B) diabetes  
(C) pancreatitis  
(D) None of the above
96. Erythromycin belongs to the class of
- (A) macrolide  
(B)  $\beta$ -lactum  
(C) aminoglycoside  
(D) peptide
97. Nifedipine blocks which of the following calcium channels?
- (A) T-type  
(B) N-type  
(C) P-type  
(D) L-type
98. Cold 198 is used in
- (A) the treatment of pernicious anaemia  
(B) the detection of tumors  
(C) the treatment of rheumatoid arthritis  
(D) the detection of thyroid function
99. Dialkyl diethylmalonate when treated with urea in presence of sodium ethoxide gives
- (A) diazepam  
(B) morphine  
(C) barbiturate  
(D) sulfonamide
100. Prostaglandins are a group of related
- (A) alcohols  
(B) aldehydes  
(C) fatty acids  
(D) alkaloids

**SPACE FOR ROUGH WORK**

SEAL

1. The first step in the process is to identify the problem. This involves a thorough review of the situation and a clear definition of the issue at hand.

2. Once the problem is identified, the next step is to gather information. This can be done through research, interviews, or other means. The goal is to collect as much data as possible to better understand the problem.

3. After gathering information, the next step is to analyze the data. This involves looking for patterns, trends, and other insights that can help to identify the root cause of the problem.

4. Once the root cause is identified, the next step is to develop a solution. This involves brainstorming ideas and evaluating them to determine the best course of action.

5. Finally, the solution is implemented. This involves putting the plan into action and monitoring the results to ensure that the problem is resolved.

6. The final step in the process is to evaluate the results. This involves comparing the actual outcomes to the expected outcomes to determine the effectiveness of the solution.

7. If the solution is not effective, the process may need to be repeated. This involves going back to the beginning and identifying the problem again.

8. Once the problem is resolved, the next step is to document the process. This involves creating a record of the steps taken and the results achieved.

9. Finally, the process is reviewed. This involves looking back at the entire process to identify any areas for improvement and to ensure that the same problem does not occur again.

- (A) Identify the problem
- (B) Gather information
- (C) Analyze the data
- (D) Develop a solution
- (E) Implement the solution
- (F) Evaluate the results
- (G) Document the process
- (H) Review the process

10. The final step in the process is to ensure that the solution is sustainable. This involves putting in place measures to prevent the problem from recurring.

11. Once the solution is sustainable, the process is complete. The problem has been resolved and the organization is back on track.

- (A) Identify the problem
- (B) Gather information
- (C) Analyze the data
- (D) Develop a solution
- (E) Implement the solution
- (F) Evaluate the results
- (G) Document the process
- (H) Review the process

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