GATE (Pharmacy)-2004

1. Structural features common for **Propranolol, atenolol, pindolol, metoprolol** in the side chain is
a. Isopropylaminopropan-2-ol
b. Dimethylaminopropan-2-ol
c. Diethylaminopropan-2-ol
d. Dibutylaminopropan-2-ol

2. When N-methyl group of morphine is replaced with an allyl group, the compound formed is
a. Naloxone-morphine antagonist
b. Naltrexone-morphine agonist
c. Nalorphine-morphine antagonist
d. Nalbuphine-morphine agonist/antagonist

3. Nitrazepam can be synthesised from
a. 2-bromo-5-aminobenzophenone
b. 2-nitro-2-chloro acetophenone
c. 2-amino-5-nitro cyclohexanone
d. 2-amino-5-nitro benzophenone

4. Clavulanic acid has a beta lactam ring ring fused to
a. Thienyl system
b. Thiadiazole system
c. Thiazolidine system
d. Oxazolidine system

5. A drug has antipyretic, anti-inflammatory and antiplatelet activity is
a. Sulfinpyrazone
b. Aspirin
c. Ticlopidine
d. Acetaminophen

6. Wild Cherry bark contains prunasin which is a
a. Phenolic glycoside
b. Isothiocyanate glycoside
c. Coumarin glycoside
d. Cyanogenetic glycoside

7. *Ephedra sinica* and *Ephedra equisetina* can be distinguished by type of
a. Branching
b. Stomata
c. Scaly leaf
d. Alkaloids

8. Micro propagation of the plants is carried out through
a. Cross fertilization
b. Seed germination
c. Plant tissue culture
d. Grafting

9. Aconite belongs to the group of
a. Steroidal alkaloid
b. Terpinoidal alkaloid
c. Indole alkaloid
d. Quinoline alkaloid

10.Crude fibre value is a measure of
a. Soft tissue matter
b. Woody matter
c. Mineral matter
d. Organic matter

11. One of the units used for expressing pressure is 'torr' and it is equal to
a. cm of Hg
b. mm of Hg
c. psi
d. gauss

12. Removal of single electron from a molecule reults in the formation of
a. Fragment ion
b. metastable ion
c. Molecular ion
d. Rearrangement ion

13. Nuclear Magnetic Moment is not shown by
a. ^{13}C
b. ^{16}O
c. ^{1}H
d. ^{15}N

14. Derivatisation technique in HPLC are intended to enhance
a. Molecular weight
b. Detectability
c. Reversibility
d. Reproducibiliity

15. A conductance cell is calibrated by using a solution of known conductivity i.e usually a solution of
a. NaCl
b. Hg_2Cl_2
c. KCl
d. Na_2SO_4

16. Metoclopramide is generally used for
a. Prophylaxis of vomiting
b. Preventing motion sickness
c. Treating irritable bowel syndrome
d. Treatment of pancreatic insufficiency

17. DNA amplification by polymerase chain reaction uses
a. *Thermus aquaticus* DNA polymerase
b. DNA topoisomerase
c. RNA polymerase
d. DNA helicase

18. Identify the non-pathogenic organism
a. *Mycobacterium bovis*
b. *Mycobacterium smegmatis*
c. *Mycobacterium avium*
d. *Mycobacterium intracellulare*

19. Bioassays are carried out to
a. Measure the pharmacological activity of drugs
b. Avoid clinical trials for new drugs
c. Detect clinical trial for new drugs
d. Screen for pharmacogenetic influence of new drugs

20. A direct way of studying idiosyncratic reaction to a geven drug is by
a. Changing the route of new drug administration
b. Changing the assay method
c. Pharmacogenomics
d. Structure activity relationship studies of a family of compounds

21. An example of haemopoietic growth factor is
a. Platelet derived growth factor
b. Epidermal growth factor
c. Iron dextran
d. Eythropoietin

22. Safrannin is used as a reagent to detect
a. Gram-negative bacteria
b. Gram-positive bacteria
c. Acid fast bacteria
d. Myxozoa

23. Sulphonamides do not have adverse drug interaction with
a. Oral anticoagulants
b. Sulfonylurea hypoglycemic agents
c. Hydantion anticonvulasnts
d. Dihydrofolate reducatase inhibitors

24. Simvasatatin belongs to
a. HMG CoA reductase inhibitor type of antielipidemic agent
b. HMG CoA reductase inhibitor type of anticoagulant agent
c. Fibrate type of anticoagulant agent
d. Fibrate type antilipidemic agent

25. HIV infection can be clinically controlled with
a. Cytarabine
b. Acyclovir
c. Zidovudine
d. Amantadine

26. The measure of cohesive strength of the crosslinking that occurs between gelatine molecules and is proportional to the molecular weight of gelatine is called
a. Bloom Strength
b. Viscosity

c. Surface tension
d. Partition coefficient

27. A water soluble substance used as coating material in microencapsulation process is
a. Polyethylene
b. Silicon
c. Hydroxy ethyl cellulose
d. Paraffin

28. One of the following is used as solubilizing agent to solubilize testosterone in pharmaceutical liquid dosage form
a. Sucrose mono stearate
b. Lanoline ester
c. Lanoline ether
d. Tween

29. One of the following is used as pH dependent controlled release excipient.
a. Carnauba wax
b. Hydroxypropyl methyl cellulose
c. Methyl cellulose
d. Glyceryl monostearate

30. The Schedule in D&C act that deals with the standards for disinfectant fluids is
a. Schedule B
b. Schedule F
c. Schedule O
d. Schedule M

31. The carboxyl group of aspirin is esterified with N-acetyl-p-aminophenol to get
a. 3-Acetamidophenyl-O-acetyl salicylate
b. 4-Acetamidophenyl-O-acetyl salicylate
c. O-(2-hydroxy benzoyl) salicylic acid
d. 2-Acetamidophenyl-O-acetyl salicylate

32. IUPAC system of nomenclature for diclophenac sodium (BP) is
a. Sodium2-[2,6-Dichlorophenyl) amino]phenyl acetate
b. Sodium 3-[2,6-Dichlorophenyl) amino]phenyl acetate
c.Sodium2-[2-Chlorophenyl)amino] phenyl acetate
d. sodium2-[6-chlorophenyl)amino] phenyl acetate

33. 1-(2- Aminoethyl) perhydroazocine on treatment with S-methyl isothiourea gives rise to an adrenergic neuron blocking agent
a. Bethanidine
b. mecamylamine
c. Guanadrel
d. Guanethidine

34. Quercetin is
a. 5,7,3’-trihydroxy flavone
b. 5,7,3,4’- trihydroxy flavone
c. 3,5,7,3,4’-pentahydroxy flavonol
d.3,5,7,3,4’-pentahydroxy flavonone

35. Meconic acid is a chemical makar for the genus
a. piper
b. pilocarpus
c. prunus
d. papaver

36. A novel diterpenoid isloted from the bark of Taxus brevifolia is
a. Demecolcine
b. Paclitaxel
c. Vinblastin
d. Brevifolicin

37. The absopition maximum for polar compounds is usually shifted with change in polarity of the solvents due to
a. Hydrogen bonding
b. Chemical reaction
c. Ionization of the compounds
d. change in the chromophore

38. A titration in which potential applied across two electrodes is maintained at a constant value and the current is measured and plotted against volume of titrant is
a. Pontentiometric titration
b. Amperometric titration
c. Displacement titration
d. Conductometric titration

39. The parameter in the elution curve that is proportional to the concentration of a compound in gas chromatographic effluent is the
a. Number of peak
b. Width of the peak
c. Area under the peak
d. Shape of the peak

40. A drug solution has a half-life of 21 days. Assuming that the drug undergoes first order kinetic, how long will it take for the potency to drop to 90% of the initial potency?
a. 3.2 days
b.9.6 days
c.16 days
d. 6.4 days

41. An amphoteric surfactant used in pharmaceutical disperse system is
a. Bile salt
b. Lecithin
c. Sorbitan mono laurate
d. Sorbitan mono stearate

42. An abrasive used in dentifrices is
a. Dicalcium phosphate
b. Sodium carboxy methyl cellulose
c. Sodium lauryl sulphate
d. Dioctyl sodium sulfosuccinate

43. An electrochemical method that enhances the transport of some solute molecules by creating a potential gradient through skin tissue with an applied electrical current or voltage is called
a. Electrophoresis
b. Iontophoresis
c. Osmosis
d. Implants

44. A patient with rheumatoid arthritis has been taking acetyl salicylic acid regularly; recently she has been experiencing stiffness, swelling, and pain due to salicylic acid resistance. She has occult blood in her faces. Suggest an appropriate drug suitable for her from those mentioned below.
a. Paracetamol
b. Celecoxib
c. Piroxicam
d. Naproxen

45. The breakdown of fibrin is catalysed by
a. Plasmin
b. Renin
c. Urokinase
d. Ptylin

46. Which one of these best describes a process carried out to render a drug pharmacokinetically more acceptable?
a. Enteric coating of diclofenac
b. Co administration of aspirin with antacid
c. Use of colloidal suspension or liposomes for administering apmphotericin-B
d. Synthesis of an analogue to obtain higher receptor specificity

47. Azithromycin is clinically administered once daily as compared to erythromycin which is administered every 6 hours because Azithromycin
a. Penetrate into most tissues and is released very slowly
b. Has methylated nitrogen in its lactone ring which render it much more potent than erythromycin
c. Is a very potent antibiotic but not tolerated well in the GIT
d. Is usually presented in a sustained released dosage

48. A patient showing muscle rigidity, bradykinesia, tremors and postural instability was administered Levodopa. Which of the properties of Levodopa is not true?
a. Levodopa is preferred over dopamine because it can cross the blood brain barrier
b. Levodopa is the levo rotatory stereoisomer of 3,4-dihydroxy phenylalanine
c. Levodopa gets decarboxylated in the brain to dopamine
d. Levodopa is administererd because of its strong antagonistic action on dopamine receprtors

49. Autoimmunity refers to
a. An automatic trigger of the immune system directed against a specific pathogen
b. Failure to distinguish between self and non self
c. An automatic segregation of T and B cells
d. Failure of B cells to interact with T cells

50. Which of these is true about the discovery of HB antigen in the blood of people infected with hepatitis B?
a. It provides the basis for vaccine design
b. It indicated that specific vaccines cannot be designed for Hepatitis B
c. It has not been of much significance
d. It indicated that Hepatitis B is a viral disease

51. Which drug molecule does not have phenylethyl amine moiety?
a. Amphetamine
b. Glyburide
c. Pheniramine
d. Mescaline

Q.No 52-58 are multiple selection items. P,Q,R,S are the options. Two of these options are correct. Choose the correct combination.

52. There are two methods by which the duration of action of insulin may be prolonged
P. Binding with resin
Q. Esterification of amino acid residues
R. Forming of complex of insulin with protein
S. Modification of particle size
a. Q,R b. R,S c. P,S d. P,R

53. The attributes of cycloserine are
P. No tautomerism shown
Q. Exists in equilibrium with its tautomeric enolic form
R. Stable in alkaline solution, destroyed rapidly at neutral or acidic pH
S. Stable in neutral solution, destroyed in alkaline pH
a. R,S b. P,R c. Q,R d. P,R

54. Compared to benzyl penicillin, amoxicillin has the following advantages in biological properties
P. The amino group renders the antibiotic resistant to acid catalysed degradation.
Q. The spectrum of activity is broadened
R. The amino group renders penicillinase resistant to the compound.
S. The phenolic group renders penicillinase resistant to the compound.
a. P,Q b. P,R c.P,S d. Q,R

55. Identification of propellant in pharmaceutical aerosols is carried out by
P. Gas chromatography
Q. Tag Open cup apparatus
R. Pyknometer
S. IR spectrophotometer
a. P,Q b. P,S c. Q,R d. R,S

56. Schedule 'H' and schedule 'S' as per the drug and cosmetic act deal with the following
P. Prescription drugs which are required to be sold by retail only on prescription of RMP.
Q. Standards for cosmetics
R. Biological and special products
S. List of coal tar colours permitted to be used in cosmetics and soaps
a. P,Q b. P,R c. Q,S d. R,S

57. Myristica fragrans Houtt. has two of the following characteristics
P. An indecidous tree, which produces drupaceous, pale yellow fruits.
Q. Each fruit has several round seeds with smooth surface and lignaceous tegument, and the red fleshy aril-the mace, is present inside the seed.
R. A decedous tall tree, which produces lignaceous capsules
S. Each fruit has unique ovoid seed with lignified tegument, surrounded by orange red laciniate fleshy aril-the mace
a. Q,R b. P,R c. P,S d. Q,S

58. In size exclusion chromatography the stationary phase used are
P. Alumina
Q. Dextran
R. Agarose
S. Styrene
a. P,S b. Q,R c. Q,S d. P,R

Q. 59-65 are matching exercise. Group I with Group II. Choose the correct combination.

59.

Group I	Group II
Synthetic drugs	Intermediate from which group II drugs are synthesised
P. Buclizine	1. Aziridine and thiophosphoryl chloride
Q. Chlorophenesin	2. 4-chlorophenol
R. Thiotepa	3. 4-chlorobenzhydryl chloride
S. 2-amino-5-chlorobenzophenone	

a. P-3,Q-2,R-1,S-4
b. P-2,Q-2,R-1,S-3
c. P-2,Q-4,R-3,S-1
d.P-1,Q-2,R-4,S-3

60.

Group I	Group II
Cardiac agent	Mechanism of action
P. Digitoxin	1. Poduces negative inotropic effect by blocking calcium channels
Q. Dobutamine	2. Depresses adrenergically enhcanced calcium influx through beta receptor blockade
R. Sotalol	3. Causes elevation of cAMP levels by stimulation of adenylate cyclase
S. Nicardipine	4. Inhibits membrane bound sodium potassium ATpase pump

a. P-4,Q-3,R-2,S-1
b. P-3,Q-4,R-1,S-2
c. P-4,Q-2,R-3,S-1
d. P-4,Q-3,R-1,S-2

61.

Group-I	Group-II
Technique employed	Source of Radiation
P. Visible spectrophotometry	1. R_f Source transmitter
Q. IR spectrophotometry	2. Xenom lamp
R. NMR spectrophotometry	3. Tungsten lamp
S. Fluorescence spectrophotometry	4. Nernst glower

a. P-2,Q-4,R-3,S-1
b. P-3,Q-2,R-1,S-4
c. P-3,Q-4,R-1,S-2
d. P-4,Q-1,R-3,S-2

62.

Group-I	Group-II
Amino acids	common degardative products that are citric acid cycle intermediate or their precursors
P. Aspartic acid	1. SuccinyI CoA
Q. Argninine	2. Alpha-Ketoglutarate
R. Serine	3. Fumarate
S. Methionine	4. Pyruvate

a. P-3,Q-2,R-4,S-1
b. P-3,Q-1,R-4,S-2
c. P-1,Q-2,R-3,S-4
d. P-4,Q-2,R-3,S-1

63.

Group-I	Group-II
Tablets defects	Explanation
P. Picking	1. A term used to describe the surface material adhering to and being removed from the tablet's surface by a punch
Q. Sticking	2. Term refers to tablet material adhering to the die wall
R. Mottling	3. Term refers to an unequal distribution of colour on a tablet
S. Lamination	4. Term refers to separation of tablet into two or more distinct layers.

a. P-1,Q-2,R-3,S-4
b. P-1,Q-3,R-4,S-2
c.P-2,Q-4,R-3,S-1
d. P-3,Q-1,R-2,S-4

64.

Group I	Group II
Lanatosides	Aglycone
P. Lanatoside A	1. Gitoxigenin
Q. Lanatoside B	2. Diginatigenin
R. Lanatoside C	3. Digoxigenin
S. Lanatoside D	4. Digitoxigenin

a. P-4,Q-1,R-3,S-2
b. P-1,Q-2,R-4,S-3
c. P-3,Q-4,R-2,S-1
d. P-2,Q-3,R-1,S-4

65.

Group I	Group II
Specific chemical test	Phytoconstituents
P. Thalleioquin test	1. Hyoscyamine
Q. Murexide test	2. Barbaloin
R. Vitali-Morin test	3. Quinine
S. Modified Bormtrager's test	4. Theobromine

a. P-2,Q-3,R-4,S-1
b. P-3,Q-4,R-1,S-2
c. P-1,Q-2,R-3,S-4
d. P-4,Q-1,R-2,S-3

Q.No. 66-90 are based on statement/problem. Choose the correct answer for each question.

Data for Q. 66-68

In a formulation development laboratory a tablet is to be formulated. The core tablet has a bad taste and requires physical and chemical protection of the drug from moisture. The tablet should also deliver the drug for local action in the intestine.

66. Suggest a suitable method
a. Sugar coating
b. Enteric coating
c. Film coating
d. Sub coating

67. Choose the correct coating material to be used
a. Sugar
b. Acacia
c. Ethyl cellulose
d. Cellulose acetate phthalate

68. Choose the correct solvent for the coating material.
a. Acetone
b. Water
c. Propylene glycol
d. Glycerine

Data for Q. 69-70

Compound A with the formula C_2H_7N shows the following important bands in the IR spectra; (a) 3423 cm^{-1} (b) 3236 cm^{-1}

69. Assign these bands to the important group in the compound A
a. CH_3
b. $–NH_2$
c. –CN
d. =C=N-

70. On treatment with nitrous acid the compound A is converted to B, which shows a strong band at 3430 cm^{-1}
Assign the absorption band for the group formed the product
a. –OH
b. =C=N-
c. –COOH
d. -N=N-

Data for Q.71-73

In the assay of sulfamethoxazole I.P.($C_{10}H_{11}N_3O_3S$), 0.2 g of the sample was dissolved in 50ml of 2M HCl . To this was added 3 g of KBr and the titration was carried out.

71. Titration was carried out using
a. $NaNO_2$ to estimate the amino acid
b. $NaNO_2$ to estimate the sulphonamide group
c. NaOH to estimate the amino group
d. NaOH to estimate the sulphamido group

72. The end point in the assay was determined by
a. Conductometric method
b. Using an indicator
c. Potentiometric method
d. Photometric method

73. If the volume of 0.1 M titrant consumed was 7.8 ml, calculate the % purity of the sample
a. 99.70%
b. 9.97%
c. *.87%
d. 98.79%

Data for Q. 74-75

A drug, which is unstable to light, susceptible to oxygen and gets degraded in presence of metallic ions, has to be formulated in the form of a solution for injection.

74. Choose a suitable additive to improve the stability of the injection
a. Preservative
b. Chelating agent
c. Buffer
d. Tonicity contributor

75. Select the appropriate filling and packing method for the above product.
a. Filling in an amber coloured ampoule with an addition of antioxidant, replacing the inside air with nitrogen and sealing
b. Filling with an antioxidant dissolved in the solution and sealing the ampoule
c. Filling in an amber coloured ampoule with a preservative and sealing
d. Filling in an ampoule, sealing and giving direction to store it in dark

Data for Q.76-77

The usual adulterants for buds are clove stalks and anthophylli

76. Clove stalks can be identified by the presence of
a. Starch grains
b. Cystoliths
c. Lignified sclereids
d. Acicular crystal of calcium oxalate

77. Anthophylli can be identified by the presence of
a. Lignified sclereids
b. Acicular crystal of calcium oxalate
c. Cystoliths
d. Starch grains

Data for Q.78-80

Plant tissue culture of carrot is being developed in the laboratory on a semisolid White's medium.

78. The micronutrient essential in the medium is
a. NaCl
b. $CoCl_2$
c. KCl
d. $CaCl_2$

79. The pH of the medium is
a. 6.6
b. 6.0
c. 5.6
d. 5.0

80. The tissue growth observed is
a. Undifferentiated cells suspended in the medium
b. Undifferentiated cells in clusters distributed in the medium
c. Differentiated mass of cells
d. Surface growth of undifferentiated mass of cells

Data for Q. No 81-82

In glucose metabolism, name the enzymes catalysing the following steps

81. Conversion of glucose to glucose-6-phosphate
a. Hexokinase
b. Glucose-6-phosphate dehydrogenase
c. Glycogen phophorylase
d. Glycogen synthase

82. Conversion of 2-phosphoglycerate to phosphoenol pyruvate
a. Pyruvate kinase
b. Phosphoglycerate mutase
c. Phosphoglycerate kinase
d. Enolase

Data Q.No. 83-84

Methotrexate, trimethoprim and pyrimethamine are all known to be inhibitor of dihydrofolate reductase. Yet they are classified in different therapeutic categories

83. Trimethoprim has an advantage over methotrexate in its therapeutic category because

a. Trimethoprim binds to bacterial DHFR about 50000 times more strongly as compared to the host DHFR.
b. Trimethoprim can administered orally
c. Trimethoprim exhibits no significant adverse effect
d. Trimethoprim has additional anti-inflammatory properties.

84. Methotrexate is thought to exert its actions by
a. Interfering with purine synthesis
b. Intracellular formulation of an amine adduct
c. Forming a conjugate with nucleic acids
d. Inhibitting the synthesis of folic acid

Data for Q.No 85-87

An administrative officer having high blood pressure, gastric acidity and diabetes is prescribed famotidine, enalapril and tolbutamide.

85. From the structural features of the drugs, predict which will be ionized in the stomach
a. Famotidine
b. Enalapril
c. Tolbutamide
d. Enalapril and Tolbutamide

86. The patient cannot tolerate enalapril. Which of the following can be substituted?
a. Omeprazole
b. Losartan
c. Rosigitazone
d. Clofibrate

87. Famotidine act as
a. H_1 histamine antagonist
b. H_2 histamine antagonist
c. Proton pump inhibitor
d. H_1 agonist

Data for Q.No 88-90

2-methoxynphthalene on treatment with acetyl chloride in presence of $AlCl_3$ gives 2-acetyl-6-methoxy naphthalene. This is converted with a set of reagents-X to methoxy-2-naphthyl acetic acid, which is esterified with methanol to the methyl ester. Ester on treatment with Y gives DL-2-(6-methoxy-2-naphthyl)-propionic acid methyl ester. This is on hydrolysis gives Z (Final compound).

88. The set of reagent-X are
a. Morpholine/Sulphur followed by H_2SO_4/H_2O
b. Morphine/sulphur followed by HCl /H_2O
c. Formic acid/Cu followed by acetic acid
d. Hydroiodic acid followed by H_2SO_4/H_2O

89. Identify the reagents-Y
a. $NaOH/CH_3OH$

b. NaH/CH_3I
c. Hydrazine/CH_3I
d. $LiAlH_4/CH_3OH$

90. Final Compound Z is
a. Naphazoline
b. Carprofen
c. Pranoprofen
d. Naproxen

ANSWER KEY FOR GATE – 2004

1(A)	2(C)	3(D)	4(D)	5(B)	6(D)
7(C)	8(C)	9(B)	10(B)	11(B)	12(C)
13(B)	14(B)	15(C)	16(A)	17(A)	18(B)
19(A)	20(C)	21(D)	22(A)	23(D)	24(A)
25(C)	26(A)	27(C)	28(D)	29(B)	30(C)
31(B)	32(A)	33(D)	34(B)	35(D)	36(B)
37(A)	38(B)	39(C)	40(A)	41(B)	42(A)
43(B)	44(B)	45(A)	46(B)	47(A)	48(D)
49(B)	50(A)	51(C)	52(C)	53(C)	54(A)
55(B)	56(A)	57(C)	58(C)	59(B)	60(A)
61(C)	62()	63(A)	64(A)	65(B)	66(C)
67(D)	68(A)	69(B)	70(D)	71(B)	72(C)
73(D)	74(B)	75(A)	76(D)	77(D)	78(B)
79(C)	80(D)	81(A)	82(D)	83(A)	84(D)
85(D)	86(B)	87(B)	88(D)	89(A)	90(D)