STOP TEST FOR PHARMACEUTICAL ANALYSIS
1 point

1. Indicator for direct aqueous titration is:
   a) potassium permanganate
   b) bromcresol green
   c) tropeolin OO
   d) phenophythaleine
   e) all answers are not correct

2. Indicator for direct non – aqueous titration of bases is:
   a) crystalviolet
   b) potassiun chromate
   c) methylorange
   d) methylene blue
   e) all answers are not correct

3. Titrant for direct non – aqueous titration of bases is:
   a) HCl
   b) $AgNO_3$
   c) H_2SO_4
   d) $HClO_4$ in CH_3COOH
   e) all answers are not correct

4. Titrant for direct complexometric method is:
   a) $NaNO_2$
   b) $KBrO_3$
   c) I_2
   d) KIO_3
   e) all answers are not correct

5. The name of direct argentometric titration is method of:
   a) Bouge – Lambert
   b) Schmidt – Kolbe
   c) Mor
   d) Traube
   e) all answers are not correct

6. The name of indirect argentometric titration is method of:
   a) Folchard
   b) Hanch
   c) Kolbe – Schmidt
   d) Beer
   e) all answers are not correct

7. In titration with perchloric acid in glacials acetic acid to the determined hydrochoride of base is added:
   a) mercury acetate
   b) mercury chloride
   c) potassium bromide
   d) imidazole – mercury reactive
   e) all answers are not correct

8. In accordance to European Pharmacopoeia by direct cerimetry are determined the following substances:
   a) Paracetamol
   b) Ascorbic acid
   c) Nifedipine
   d) answers a), b), c) are correct
   e) answers a), b), c) are not correct

9. According to European Pharmacopoeia substances Menadione and Paracetamol are determined by:
   a) HPLC
   b) TLC
   c) spectrophotometry
   d) indirect cerimetry
   e) all answers are not correct

10. In spectrophotometry the energy is in proportional accordance with:
   a) frequency
   b) Plank constant
   c) velocity of light
   d) wave number
   e) all answers are correct

11. The close ultraviolet is separated into the following subareas:
    a) UV- A (200 – 280 nm), UV-B (280 – 315 nm, UV- C (315 – 400 nm
    b) UV-C (200 – 280 nm), UV-A (280 – 315 nm) and UV-B (315 – 400 nm)
    c) UV-C (200 – 280 nm), UV-B (280 – 315 nm) and UV-A (315 – 400 nm)
    d) UV-A (200 – 280 nm), UV-C (280 – 315 nm) and UV-B (315 – 400 nm)
    e) all answers are not correct

12. In spectrophotometry for quantitative analysis of drugs are applied the following methods:
    a) single standard method; time of flight method
    b) method of specific absorbance
    c) method of specific absorbance; time of flight method
    d) time of flight method
    e) all answers are correct

13. The specific absorbtance is expressed with the following units:
    a) g/100 ml
    b) g/l
    c) mg/ml
    d) mg/l
    e) all answers are not correct

14. The molar absorbance is expressed with the following units:
    a) g/100 ml
    b) g/10 ml
    c) mol/l
    d) mg/l00 ml
    e) all answers are not correct

15. The wave number is expressed with the following units:
    a) nm
    b) nm^{-1}
    c) cm
    d) cm^{-1}
    e) all answers are not correct

16. In stretching vibrations:
    a) the bond length is changed; the valent angle is changed
    b) the bond length is changed; the valent angle is not changed
    c) the bond length is not changed; the valent angle is not changed
    d) the bond length is not changed; the valent angle is changed
    e) all answers are not correct

17. In deformation vibrations:
    a) the valent angle is changed; the bond length is changed
    b) the valent angle is not changed
    c) the valent angle is changed
    d) the bond length is changed
    e) all answers are not correct

18. Basic characterizing parameters in NMR spectra are:
    a) chemical shift; Van de Empter equation
    b) area of the resonans signal; spin – spin interaction; chemical shift
    c) area of the resonans signal; transmittance
    d) spin – spin interaction; retention time
    e) all answers are not correct

19. Chemical shift (δ) is expressed with the following units:
    a) parts per million
    b) cm^{-1}
    c) cm
    d) nm^{-1}
    e) nm

20. In thin layer chromatography are used the following sorbents:
    a) silicagel
    b) aluminium oxide
    c) methanol
    d) answers a), b) are correct
    e) answers a), b) are not correct

21. In thin layer chromatography are used the following sorbents:
    a) cellulose
    b) polyamides
    c) butanol
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

22. In thin layer chromatography are applied the following sorbents:
    a) aluminium oxide; butanol; silicagel; cellulose; methanol; polyamides
    b) aluminium oxide; butanol; silicagel
    c) cellulose; methanol; polyamides; silicagel
    d) silicagel
    e) all answers are correct

23. The used in thin layer chromatography solvents must:
    a) not react with analysed components
    b) not react with sorbents
    c) be pure
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

24. Thin layer chromatography is applied for:
    a) identity
    b) test for purity
    c) quantitative analysis
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

25. For the visualization of spots in thin layer chromatography is applied:
    a) UV – light at 254 nm
    b) UV – light at 365 nm
    c) spraying with different solvents
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

26. The effectivity of separation of compounds in HPLC is measured by:
    a) retention time
    b) selectivity
    c) number of theoretical plates
    d) answer a), b), c) are correct
    e) answer a), b), c) are not correct

27. In HPLC for quantitative analysis is applied method of:
    a) internal standard
    b) external standard
    c) calibration curve
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

28. In HPLC are used the following detectors:
    a) flame – ionization
    b) elektron – capture
    c) UV
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

29. In HPLC are used the following detectors:
    a) mass
    b) electrochemical
    c) UV
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

30. In HPLC are used the following detectors:
    a) refractometric
    b) fluorescence
    c) UV
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

31. In HPLC are used the following detectors:
    a) mass; elektron – capture
    b) electrochemical; elektron – capture
    c) UV; flame – ionization
    d) fluorescence; refractometric
    e) all answers are not correct

32. In GC for quantitative analysis is applied method of:
    a) internal standard
    b) external standard
    c) calibration curve
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

33. In GC are used the following detectors:
    a) fruorescence
    b) elektron – capture
    c) flame – ionization
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

34. For the determination of volatile impurities in the European Pharmacopoeia is recommended the following method:
a) high performance liqud chromatography
b) gas chromatography
c) UV – spectrophotometry
d) infrared spectrophotometry
e) thin – layer chromatography

35. In accordance with European Pharmacopoeia Captopril substance is determined by:
a) iodchlorimetry
b) cerimetry
c) iodatometry
d) bromatometry
e) iodometry

36. 1,1,1,4,4,4-hexafluorobut-2-ene is an impurity of:
a) Flupenthixole
b) Fluvoxamine
c) Haloperidol
d) Halothane
e) all answers are not correct

37. In the chemical structure of which of the following drugs are simultaneously included alcohol and phenol group:
a) Ephedrine
b) Noradrenaline
c) Paracetamol
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

38. Iodophorm reaction is specific for compounds, containing:
a) alcohol or phenol group
б) ethoxy or acethyl group
c) methoxy or methyl group
d) carboxyllic group
e) amide, imide, lactone, lactame or ester group

39. Iodoform sample is apllied for identification of:
   a) amides
   b) imides
   c) esters
   d) lactones
   e) all answers are not correct

40. In applying of test for impurities of Ethanol are limited:
   a) methanol
   b) reducing compounds
   c) fat oils
   d) NH_3 and amines
   e) all answers are correct

41. In process of heating of Glycerol with sodium hydrogenphthalate is obtained:
   a) HCHO
   b) CH_3COOH
   c) H_2O and CH_3COOH
   d) acroleine
   e) HCHO and CH_3COOH

42. The included in European Pharmacopoeia impurities of Mannitol substance are:
   a) sorbitol, phenol
   b) maltitol, phenol
   c) isomaltitol, phenol
   d) phenol, phormaldehyde
   e) all answers are not correct

43. The determination of Mannitol is based on it's oxydatiton with:
   a) H_2O_2
   b) $AgNO_3$
   c) $NaNO_2$
   d) $NaIO_4$
   e) I_2

44. Phenol group is included in chemical structure of:
   a) Salicylic acid
   b) Opipramol
   c) Propranolol
   d) Ephedrine hydrochloride
   e) all answers are not correct

45. Specific property of phenols is, that:
    a) easily have been oxydased
    b) easily have been reduced
    c) have been not reduced
    d) easily have been oxydased and reduced
    e) all answers are not correct

46. Specific reaction for identification of p – nonsubstituted phenols is:
    a) reaction with solution of $FeCl_3$
    b) reaction with Br_2
    c) obtaining of nitrozo derivative by reaction of Liebermann
    d) coupling reaction
    e) all answers are not correct

47. According to European Pharmacopoeia Thymol substance is determined by:
    a) iodchlorimetry
    b) iodometry
    c) iodatometry
    d) bromatometry
    e) cerimetry

48. According to European Pharmacopoeia Resorcinole substance is determined with bromato – bromide modified method. For titrant is used:
    a) KBr
    b) $KBrO_3$
    c) $Na_2S_2O_3$
    d) KI
    e) I_2

49. The last product of hydrolysis and oxidation of Paracetamol substance is:
    a) chinonimine
    b) 4 – aminophenol
    c) chinone
    d) chinonoxime
    e) 4 – hydroxyphenol

50. The included in European Pharmacopoeia impurity of Paracetamol substance is:
    a) 4 – aminophenol
    b) 3 – aminophenol
    c) 4 – nitrophenol
    d) 3 – nitrophenol
    e) all answers are not correct

51. In accordance with European Pharmacopoeia Paracetamol substance is determined by:
    a) cerimetry, after hydrolysis with dilute hydrochloric acid
    b) nitritometry
    c) HPLC
    d) VIS – spectrophotometry, after hydrolysis and following reaction with $K_2Cr_2O_7$
    e) all answers are not correct

52. For the identification of aldehydes are used the following reactives:
    a) Feling
    b) Nesler
    c) Tolens
    d) Shiff
    e) all answers are correct

53. Aldehydes and ketones are indentified with reactions with:
    a) 2.4 – dinitrophenylhydrazine
    b) hydroxylamine hydrochloride
    c) semicarbaside
    d) phenylhydrazine
    e) all answers are correct

54. By reaction between aldehyde and hydroxylamine is obtained:
    a) lactone
    b) amide
    c) oxime
    d) hydroxamic acid
    e) hydrazone

55. Formaldehyde can be identified with:
    a) chromotopic acid
    b) ammoniacal silver nitrate solution
    c) Feling
    d) Nesler
    e) all answers are correct

56. In accordance with European Pharmacopoeia Formaldehyde is determined by:
    a) HPLC
    b) TLC
    c) spectrophotometry
    d) iodometry
    e) all answers are not correct

57. Keto group is included in chemical structure of:
   a) Haloperidol
   b) Penthoxyphulline
   c) Ketopofen
   d) Fenofibrate
   e) all answers are correct

58. Acetone can be identified with:
   a) sodium nitroprusside
   b) phenylhydrazine
   c) hydroxylamine hydrochloride
   d) answers a), b), c) are correct
   e) answers a), b), c) are not correct

59. The included in European Pharmacopoeia impurities of Salicylic acid substance are:
   a) 4 – hydroxybenzoic acid
   b) phenol
   c) 4 – hydroxybenzoic acid and phenol
   d) 3 – hydroxybenzoic acid
   e) 3 – hydroxybenzoic acid and phenol

60. The reaction with ferric chloride can be applied for the identification of:
   a) Sodium salicylate
   b) Sodium benzoate
   c) Salicylic acid
   d) answers a), b) c) are not correct
   e) answers a), b) c) are not correct

61. Which of the following compounds contain ester group:
   a) Enalapril maleate
   b) Atropine
   c) Acethylsalicylic aocd
   d) Atenolol
   e) all answers are not correct

62. The very important reaction, characterizing the stability of drugs – esters is:
   a) addition of chalogene
   b) destruction under light
   c) hydrolysis
   d) reduction
   e) oxidation

63. The name of Acethylsalicylic acid is:
a) 3 – acetoxy benzoic acid
b) 2 – acetoxy benzoic acid
c) 2 – acetoxy salicylic acid
d) Methylsalicylate
e) Phenylsalicylate

64. In hydrolysis of Acethylsalicylic acid substance are obtained:
a) acetic acid
b) salycilic acid and acetic acid
c) water and salycilic acid
d) acetone
e) phenol and acetic acid

65. Which of the following compounds contain lactone group:
a) Warfarin Sodium
b) Ascorbic acid
c) Acenocoumarol
d) answers are not correct
e) all answers are not correct

66. According to European Pharmacopoeia Ascorbic acid substance is analysed quantitatively by:
a) fluorimetry
b) residually iodatometry
c) direct iodometry
d) direct iodchlorimetry
e) direct cerimetry at indicator ferrocyphen

67. Drug, containing primary aliphatic amino group is:
a) Sulfathiazole
b) Noradrenaline
c) Acetysal
d) Benzocaine
e) Ranitidine hydrochloride

68. Drug,containing secondary aliphatic amino group is:
    a) Procaine hydrochloride
    b) Suphamethoxazole
    c) Adrenaline
    d) Captopril
    e) Sulfaguanidine

69. Drug, containing terriary aliphatic amino group is:
    a) Sulfacetamide
    b) Noradrenaline
    c) Cinnarizin
    d) Nifedipine
    e) Verapamil

70. According to European Pharmacopoeia Benzocaine substance is determined by:
    a) nitratometry, by titration with sodium nitrate in medium of HCl
    b) HPLC
    c) nitritometry, by titration with sodium nitrite in medium of HCl
    d) biological method, using formaldehyde
    e) applying of hydroxame sample

71. In reaction between p – dimethylaminobenzaldehyde and Procaine hydrochloride substance is formed:
    a) shiff base
    b) p – nitrozo derivative
    c) N – nitrosamine
    d) diazo salt
    e) o – nitrozo derivative

72. The main impurity of Procaine hydrochloride substance according to European Pharmacopoeia is:
    a) dimethylaminoethanol
    b) diethylaminoethanol
    c) 4 – aminobenzoic acid
    d) iso – phthalic acid
    e) there are no impurities in Procaine hydrochloride substance

73. In hydrolysis of Lidocaine with 80 % H_2SO_4, in boiling, is obtained:
    a) aniline
    b) 2.3 – diethylamine
    c) 3.5 – dimethylaniline
    d) 2.6 – dimethylaniline
    e) 2.5 – dimethylaniline

74. The included in European Pharmacopoeia impurity of Lidocaine hydrochloride substance is:
    a) p – aminobenzoic acid
    b) 2.6 – dimethylaniline
    c) 3.5 – diethylaniline
    d) p – chlorobenzoic acid
    e) 2.6 – diethylaniline

75. Propranolol HCl substance is identified the most completely with:
    a) melting point and IR – spectra
    b) boiling point, IR – spectra, TLC, test for chlorides
    c) melting point, IR – spectra, TLC, test for sulphates
    d) TLC and test for bromides
    e) boiling point, IR – spectra, TLC, HPLC

76. S – containing drug is:
    a) Azathioprine
    b) Progesterone
    c) Warfarin
    d) Haloperidol
    e) Phenobarbital

77. S – containing drugs is:
    a) Adrenaline
    b) Methadone hydrochloride
    c) Lidocaine hydrochloride
    d) Cimetidine hydrochloride
    e) Diazepam

78. For the identification of thiols is applied reaction with:
    a) $Hg(NO_3)_2$
    b) $AgNO_3$
    c) $HgCl_2$
    d) I_2
    e) all answers are not correct

79.Thiols and thioeters have been oxydased to:
a) sulphoxydes
b) disulphydes
c) sulphonates
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

80. According to European Pharmacopoeia Captopril substance is determined by:
a) HPLC
b) iodometry
c) cerimetry
d) bromatometry
e) all answers are not correct

81. In accordance with European Pharmacopoeia Captopril substance is determined by:
a) iodchlorimetry
b) iodometry
c) iodatometry
d) bromatometry
e) cerimetry

82. According to European Pharmacopoeia Cysteine hydrochloride substance is determined by:
a) non – acid titration
b) fluorimetry
c) TLC
d) HPLC
e) all answers are not correct

83. According to European Pharmacopoeia for titration of Cysteine hydrochloride substance the following titrant is used :
a) KI
b) I_2
c) HCl
d) $Na_2S_2O_3$
e) all answers are not correct

84. The included in European Pharmacopoeia impurity of Azathioprine substance is:
a) 6 – mercaptopurine
b) 6 – mercaptopyridine
c) 6 – mercaptopiperidine
d) 6 – mercaptopyrimidine
e) all answers are not correct

85. The included in European Pharmacopoeia impurities of Sulfamethoxazole substance are:
    a) 4-aminobenzenesulphonic acid and 4-aminobenzenesulphonamide.
    b) 4-aminobenzenesulphonic acid and 4-nitrobenzenesulphonamide.
    c) 4-nitrobenzenesulphonic acid and 4-aminobenzenesulphonamide.
    d) 4-nitrobenzenesulphonic acid and 4-nitrobenzenesulphonamide.
    e) all answers are not correct

86. The included in European Pharmacopoeia impurities of Indapamide substance are:
    a) Methylnitrosoindoline
    b) Ethylnitrosoindoline
    c) Methylnitroindoline
    d) Ethylnitroindoline
    e) all answers are not correct

87. The number of tautomeric forms of monosubstituted derivatives of barbituric acid are:
    a) 3
    b) 2
    c) 4
    d) 5
    e) all answers are not correct

88. In hydrolytical distruction of bond $N_1 - C_6$ in structure of 5.5 – disubstituted barbiturates are obtained:
    a) urea and acetic acid
    b) disubstituted acetic acid and disubstituted urea
    c) NH_3, aldehyde and ketone
    d) disubstituted acetic acid and urea
    e) barbituric acid and alkylcarboxyllic acid

89. In hydrolysis of barbituric derivatives the ring is destroyed between 1^{st} and 2^{nd} position when:
    a) near N atom at 1^{st} location occurs hydrogenous atom and at 5^{th} place there aren't exists voluminous substituents
    b) at 5^{th} situation exists capacious substituents; N atom at 1^{st} locatoion is methylated
    c) at 1^{st} position N atom is replased with Cl atom
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

90. Barbiturates can be identified with:
    a) pyridine and $CuSO_4$
    b) Co (II) salt and amine
    c) hydroxamic sample
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

91. The right test for determination of polymorph forms of Barbital substance is:
    a) solubility
    b) melting point
    c) determination of viscosity
    d) optical rotation
    e) refraction coefficient

92. Sodium salts of barbiturates are determined by:
    a) weight method
    b) spectrophotometry
    c) acid – base neutralization aqueous titration
    d) answers a), b), c) are correct
    e) answers a), b), c) are not correct

93. Sodium salts of barbiturates are determined by:
    a) acid – base neutralization non – aqueous titration and acid – base neutralization aqueous titration
    b) acid – base neutralization non – aqueous titration
    c) acid – base neutralization aqueous titration
    d) answers a,b, c are right
    e) answers a,b,c are wrong

94. Barbiturate with ”=” bond in structure is:
    a) Proxibarbital
    b) Cyclobarbarbital calcium
    c) Phenobarbital
    d) Barbital
    e) all answers are wrong

95. Barbiturate, containing both ”=” and ” ≡ ” bond in structure is:
    a) Hexobribital
    b) Methohexital
    c) Proxibarbital
    d) Pentobarbital
    e) all answers are wrong

96. Barbiturates with ”=” bond in their structure can be determined in medium of $CHCl_3$ and CH_3COOH by:
    a) bromatometry
    b) neutralization titration
    c) complexometry
    d) argentometry
    e) all answers are not correct

97. Barbiturate, containiong S in structure is:
    a) Barbital
    b) Phenobarbital
    c) Barbital, Phenobarbital
    d) Thiopental sodium
    e) answers a), b), c) are correct

98. In process of alkaline hydrolysis of thiobarbiturates are formed:
    a) thiourea
    b) CH_3COOH and thiourea
    c) H_2SO_4 and thiourea
    d) monoalkylomalonic acid and thiourea
    e) dialkylmalonic acid and thiourea

99. Used in medicine benzodiazepines are applied predominantly as:
    a) salts
    b) bases
    c) acids
    d) salts and bases
    e) salts and acids

100. Benzodiazepines are devided in the following groups:
a) 1.4 – benzodiazepines
b) diazolo – benzodiazepines
c) triazolo – benzodiazepines
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

101. 1.4 – benzodiazepines are devided in the following groups:
a) with lactame structure
b) with hydroxylactame structure
c) without O – atom in 2nd position
d) answers a), b), c) are right
e) answers a), b), c) are not right

102. 7-chloro-1-methyl-5-phenyl-1,3-dihydro-2H-1,4-benzodiazepine-2-one is name of:
a) Oxazepam
b) Temazepam
c) Nitrazepam
d) Diazepam
e) all answers are not correct

103. 1.4 – benzodiazepine, in which structure in 2nd position is not included O atom is:
a) Nordiazepam
b) Medazepam
c) Chlordiazepoxide
d) Clonazepam
e) all answers are not correct

104. 2 – pyridinyl radical is included in structure of:
a) Flunitrazepam
b) Estazolam
c) Bromazepam
d) Midazolam
e) all answers are not correct

105. Benzodiazepine drugs with lactame and hydroxylactame structures are hydrolysed to:
a) derivatives of benzophenone
b) derivatives of glycine
c) derivatives of aminobenzophenone and glycine derivatives
d) derivatives of benzophenone and glycine derivatives
e) derivatives of benzophenone and aminobenzophenone derivatives

106. 1,4 – benzodiazepines with lactame structure can be identified by reaction with:
   a) hydroxylamine hydrochloride, followed by reaction with $FeCl_3$
   b) chromotropic acid
   c) answers a) and d) are correct
   d) hydrolysis with HCl
   e) all answers are not correct

107. Substance Diazepam (1.4 –benzodiazepine derivative – 2nd type) is hydrolysed to:
   a) N – substituted aminobenzophene
   b) ketone and glycine
   c) N – oxide
   d) anilide of glyoxallic acid
   e) imide

108. Drug products – derivatives of 2.3 – dihydro – 1H – 1.4 – benzodiazepines can be determined by:
   a) iodometry
   b) complexometry
   c) argentometry
   d) acid – base neutralization aqueous titration
   e) non – water titration

109. In accordance with European Pharmacopoeia Nitrazepam substance is diluted in acetic anhydride and is determined potentiometrically by titration with:
   a) perchloric acid
   b) sodium hydroxide
   c) sodium methoxide
   d) potassium methoxide
   e) lithium methoxide

110. The included in European Pharmacopoeia impurity of Amitriptylline substance is:
   a) benzophenone
   b) 1.4 – dihydropyridine
   c) dibenzosuberone
   d) diphenylethanedione
   e) all answers are not correct

111. The included in European Pharmakopoeia impurity of Imipramine hydrochloride substance is:
   a) aminodibenzyl
   b) iminodibenzyl
   c) iminobenzyl
   d) amidodibenzyl
   e) imidodibenzyl

112. Methabolites of Clomipramine substance are:
   a) 3-, 7- and 10-Hydroxyclomipramine
   b) 2-, 6- and 10-Hydroxyclomipramine
   c) 2-, 8- and 10-Hydroxyclomipramine
   d) 3-, 4- and 10-Hydroxyclomipramine
   e) 3-, 5- and 10-Hydroxyclomipramine

113. Deanxit is combination between the following drugs:
   a) Melitracen and Flupenthixol
   b) Melitracen and Fluvoxamine
   c) Melitracen and Trifluperidol
   d) Melitracen and Trifluoperazine
   e) all answers are not correct

114. Phenothiazine derivatives are very susceptible to:
   a) light
   b) oxidation and heating
   c) light and oxidation
   d) light and heating
   e) light, oxidation and heating

115. In substitution at N atom in phenothiazine system is observed:
   a) decreasing of of intensited of absorbance
   b) increasing of of intensited of absorbance
   c) there is no observation of changre in UV – spectra
   d) hipso – or batochromic effect
   e) all answers are not correct

116. Phenothiazines, substituted at 10^{th} position exists predominantly in:
   a) H – intra form
   b) H – extra form
   c) two forms exists equally often
   d) there is no data which form is more often spread
   e) all answers are not correct

117. Phenothiazines and thioxanthenes can be identified by:
   a) hydroxame sample
   b) chromotropic acid
   c) benzaldehyde
   d) $FeCl_3$
   e) all answers are not correct

118. Thioridazine is derivative of:
   a) pyridine
   b) piperidine
   c) pyrimidine
   d) piperazine
   e) pyrolidine

119. The included in European Pharmakopoeia impurity of Flupenthixol substance is:
   a) 2-(trifluoromethyl)-9H-thioxanthen-9-one
   b) 2-(trifluoroethyl)-9H-thioxanthen-9-one
   c) 2-(trichloromethyl)-9H-thioxanthen-9-one
   d) 3-(trifluoromethyl)-9H-thioxanthen-9-one
   e) all answers are not correct

120. Mercaptopurine substance is determined by:
   a) ion – change chromatography
   b) gas chromatography
   c) complexometry
   d) non – water titration
   e) argentometry

121. Tautometic forms of xanthine are:
   a) 3
   b) 6
   c) 4
   d) 5
   e) all answers are not correct

122. In accordance with European Pharmacopoeia Caffeine substance is determined by titration with solution of:
   a) $HClO_4$ in glacial CH_3COOH
   b) CH_3ONa in dimethylformamide
   c) NaOH in methanol – benzene
   d) NaOH in ethanol
   e) tetramethylamonium hydroxide

123. Theophylline substance is determined quantitatively by indirect method of titration – interraction with $AgNO_3$ and following titration with NaOH, because:
   a) pKa = 11.3
   b) pKa = 1.2
   c) pKa = 5.0
   d) pKa = 8.0
   e) pKa = 7.0

124. Theophylline substance can be determined by direct titration with:
   a) NaOH in dimethylformamide
   b) MeOH in water
   c) NH_4OH in water
   d) HCl in water
   e) CH_3COOH in methanol

125. In accordance with European Pharmakopoeia impurities of Metamizole sodium substance are:
   a) Propyphenazone and 4 – nitroantipyrine
   b) Propyphenazone and 4 – nitrozoantipyrine
   c) 4 – nitroantipyrine and 4 – nitrozoantipyrine
   d) Amidophen and 4 – aminoantipyrine
   e) all anwers are not correct

126. Drug, containing nitro group is:
   a) Paracetamol
   b) Phenylbutazone
   c) Celecoxib
   d) Nimesulide
   e) all anwers are not correct

127. Drugs, containing S are:
a) Phenylbutazone, Nimesulide
b) Sodium diclofenac, Piroxicam
c) Celecoxib, Tenoxicam Meloxicam
d) Ibuprovfrn Ketoprofem
e) all anwers are not correct

128. According to European Pharmacopoeia Indomethacine substance is identified with:
a) p – dimethylaminobenzaldehyde
b) α – naphttol
c) β – naphthol
d) murexid reaction
e) all answers are not correct

129. According to European Pharmacopoeia impurity in Indomethacine substance is:
a) salicylic acid
b) 4-chlorobenzoic acid
c) phenol, 4 – hydroxyisophthalic acid
d) answers a), b), c) are right
e) answers a), б), c) are not correct

130. According to European Pharmakopoeia the impurity of Indomethacine substance is:
a) o – chlorobenzoic acid
b) 2 – trifluoromethylthioxantrone
c) p – hydroxybenzoic acid
d) p – chlorobenzoic acid
e) m – chlorobenzoic acid

131. In accordance with European Pharmacopoeia Indomethacine substance is determined by titration with:
a) sodium hydroxide
b) sodium methoxide
c) potassium methoxide
d) lithium methoxide
e) perchloric acid

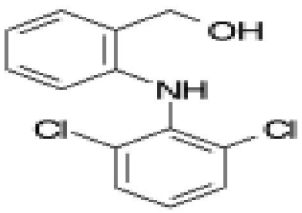
132. In accordance with European Pharmacopoeia Diclofenac sodium substance is diluted in glacial acetic acid and is determined potentiometrically by titration with:
a) sodium hydroxide
b) dimethylformamide
c) tetrabuthylamonium hydroxide
d) potassium iodate
e) perchloric acid

133. In accordance with European Pharmacopoeia substance Phenylbutazone is determined by titration with:
a) iodine
b) sodium nitrite
d) cerium sulphate
a) sodium hydroxide
e) perchloric acid

134. According to European Pharmacopoeia Nimesulide substance is determined by:
a) fluorimetry
b) iodometry
c) cerimetry
d) titration with sodium hydroxide
e) all answers are not correct

135. In accordance with European Pharmacopoeia Nimesulide substance is analysed quantitatively by:
a) fluorimetry
b) direct iodometry
c) cerimetry
d) titration with sodium hydroxide
e) all answers are not correct

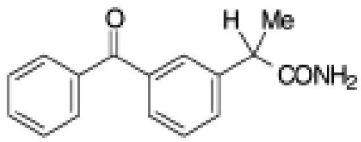
136. The following compound is included in European Pharmacopoeia as an related substance in substance:



a) Metamizole sodium
b) Diclofenac Sodium
c) Tenoxicam
d) Meloxicam
e) all anwers are not right

137. The included in European Pharmacopoeia 3-acetylbenzophenone an impuritie of:
a) Nimesulide
b) Ketoprofen
c) Diclofenac Sodium
d) Indometacin
e) all answers are correct

138. The following compound is included in European Pharmacopoeia is an related substance in substance :



a) Piroxicam
b) Phenylbutazone
c) Ketoprofen
d) Ibuprofen
e) all anwers are not right

139. Dragrndorf 's reactive is applied for:
a) non – aqueous titration
b) complexometric titration
c) acid – base neutralization titration
d) identification of flavonoids
e) identification of alkialoids

140. Agonists of acethylcholinic receptors are:
a) Acetylcholine, Carbachol, Atropine
b) Acetylcholine, Carbachol, Pilocarpine
c) Acetylcholine, Atropine
d) Carbachol, Atropine
e) Pilocarpine, Atropine

141. Non – reversible inhibitors of the enzyme acethylcholinesterase are:
   a) Galantamine, Neostigmine, Physostigmine
   b) Galantamine
   c) Neostigmine
   d) Physostigmine
   e) all answers are not correct

142. In the chemical structure of which of the following drugs is included the lactone group:
   a) Scopolamine
   b) Pseudoephedrine
   c) Pilocarpine
   d) Atropine
   e) all answers are correct

143. Which of the following tropane alkaloids gives not Vitali – Morin reaction:
   a) Atropine SO_4
   b) Scopolamine HBr
   c) Homatropine HBr
   d) Tropacine
   e) Atropine

144. Hyosciamine and Scopolamine are esters of:
   a) L and D – tropic acid
   b) L – tropic acid
   c) D – tropic acid
   d) tropine
   e) D – 2.4.6 – trinitrotropic acid

145. In reaction of Vitali – Morin Atropine is hydrolysed to:
   a) tropine and tropic acid
   b) tropic acid
   c) tropine
   d) ester of tropic acid
   e) tropine and trinitrotropic acid

146. In the reacton of Vitali – Morin Atropine reacts with :
   a) H_2SO_4
   b) HCl
   c) HNO_3
   d) H_3PO_4
   e) all answers are not correct

147. Atropine and Methylatropine are racemates, containing:
a) L and D – tropic acid
b) L – tropic acid
c) D – tropic acid
d) tropine
e) all answers are not correct

148. Nicotine is derivative of :
a) pyridine and piperidine
b) pyridine and furane
c) pyridine and imidazole
d) pyridine and pirimidine
e) all answers are not correct

149. Agonists of α and ß receptors are:
a) Norepinephrine
b) Epinephrine
c) Dopamine
d) answers a, b, c are correct
e) all answers a, b, c are not correct

150. Drug, which not containe phenol group in it's structure is:
a) Nordrenaline
b) Ephedrine
c) Adrenaline
d) Salbutamol
e) all answers are not correct

151. The chemical structure of Adrenochrome is :
a) 3-Hydroxy-1-methyl- 2,3-dihydro-1*H*-purine-5,6-dion
b) 3-Hydroxy-1-methyl- 2,3-dihydro-1*H*-indol-5,6-dion
c) 3-Hydroxy-1-methyl- 2,3-dihydro-1*H*-imidazole-5,6-dion
d) 3-Hydroxy-1-methyl- 2,3-dihydro-1*H*-benzazepine-5,6-dion
e) all answers are not correct

152. Indicate which of the following drug is imidazole derivative:
a) Naphazoline
b) Pilocarpine
c) Xylometazoline
d) answers a, b, c are correct
e) answers a, b, c are not correct

153. In European Phamacopoeia is included the following impurity of Naphazoline substance:
a) α – naphazoline
b) γ – naphazoline
c) δ – naphazoline
d) ε – naphazoline
e) ß – naphazoline

154. The number of methyl groups in chemical structure of Xylometazoline is:
a) 6
b) 5
c) 4
d) 3
e) 2

155. In accordance with the European Phamacopoeia for the identification of Salbutamol substance is appied:
a) infrared absorption spectrophotometry
b) UV – spectrophotometry by calculation of the specific absorbance
c) thin layer chromatography
d) answers a, b, c are correct
e) answers a, b, c are not correct

156. According to European Phamacopoeia by HPLC method are analysed the impurities of the following substances:
a) Salbutamol
b) Ephedronel
c) Naphazoline
d) answers a, b, c are correct
e) answers a, b, c are not correct

157. In accordance with the European Phamacopoeia Dihydroergotamine tartrate substances is dissolved in pyridine and is titrated with:
a) perchloric acid
b) sodium hydoxyde
c) tetrabutylammonium hydroxide
d) iodine
e) all answers are not correct

158. The included in the European Phamacopoeia hydroxamic reaction can be applied for the identification of:
   a) Ergocryptine
   b) Scopolamine
   c) Ergocristine
   d) Pilocarpine
   e) all answers are correct

159. In European Phamacopoeia is included test for optical rotation for:
   a) Ephedrine
   b) Pseudoephedrine
   c) Nicotine
   d) answers a, b, c are correct
   e) answers a, b, c are not correct

160. Non selective ß – blokers are:
   a) Oxprenolol
   b) Penbutolol
   c) Pindolol
   d) Propranolol
   e) all answers are not correct

161. β_1 – selective blockers are:
   a) Acebutolol, Alprenolol
   b) Atenolol, Esmolol, Bisoprolol
   c) Betaxolol, Butaxamine
   d) Metoprolol, Metipranolol
   e) Nebivolol, Nadolol

162. Combined α_1/β – adrenergic antagonists are:
   a) Carteolol
   b) Levobunolol
   c) Timolol
   d) Carvedilol
   e) Mepindolol

163. β_2 – selective bloker with a weak α – adrenergic agonist activity is:
   a) Celiprolol
   b) Labetalol
   c) Butaxamine
   d) Sotalol
   e) all answers are not correct

164. The included in European Phamacopoeia the related substances in Pindolod substance are:
a) 4-(2,3-dihydroxypropoxy) indole
b) 4-hydroxyindole
c) 4-(2-hydroxy-3-chloropropoxy) indole
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

165. Derivative of L – valine is the following drug:
a) Irbesartan
b) Olmesartan
c) Valsartan
d) Telmisartan
e) all answers are not correct

166. Telmisartan is derivative of:
a) Benzoimidazole
b) Benzofurane
c) Benzodiazepine
d) Benzoimidazole
e) Benzothiazole

167. According to European Pharmacopoeia Nifedipine substance is determined by:
a) nitritometry
b) spectrophotometry after reduction and diazo coupling reaction
c) spectrophotometry after hydroxame sample
d) cerimetry
e) all answers are not correct

168. Which of the following drug contain in it's structure nitro group:
a) Felodipine
b) Lercanidipine
c) Amlodipine
d) Istadipine
e) all answers are not correct

169. Phosphonate – containing ACE inhibitors are:
a) Enalapril
b) Ramipril
c) Quinapril
d) Perindopril
d) Lisinopril

170. The included in European Phamacopoeia related substance in Clofibrate substance is:
   a) Captopril sulphide
   b) Captopril disulphide
   c) Captopril trisulphide
   d) Captopril tetradisulphide
   e) all answers are not correct

171. According to European Phamacopoeia the related substance in Clofibrate substance is examined by:
   a) TLC
   b) gas chromatography
   c) HPLC
   d) UV – spectrophotometry
   e) all answers are not correct

172. Derivative of L – valine is the following drug:
   a) Irbesartan
   b) Olmesartan
   c) Valsartan
   d) Telmisartan
   e) all answers are not correct

173. Telmisartan is derivative of:
   a) Benzoimidazole
   b) Benzofurane
   c) Benzodiazepine
   d) Benzoimidazole
   e) Benzothiazole

174. Statins:
   a) lower LDL cholesterol and HDL-cholesterol
   b) raising LDL cholesterol HDL-cholesterol
   c) lower LDL cholesterol raising HDL-cholesterol
   d) lower HDL cholesterol raising LDL-cholesterol
   e) answers a), b), c0 are not correct

175. Bad cholesterol is:
a) LDL, HDL
b) LDL
c) HDL
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

176. In the chemical structure of Lovastatin are included both the following groups:
a) ester and lactone
b) amino and lactotone
c) amide and lactone
d) nitro and lactone
e) answers a), b), c) are not correct

177. In the chemical structure of Simvastatin structure are included both the following groups:
a) lactame and lactone
b) amino and nitro
c) phenol and amide
d) ester and lactone
e) answers a), b), c) are not correct

178. According to European Phamacopoeia the related substances in Lovastatin substance are determined by:
a) gas chromatography
b) liquid chromatograph
c) TLC
d) UV – spectrophotometry
e) all answers are not correct

179. F – atom is included in chemical structure of the following drugs:
a) Atorvastatin, Fenofibrate
b) Rosuvastatin, Fenofibrate
c) Fluvastatin, Fenofibrate
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

180. Fluvastatin is derivative of:
a) pirazine
b) indole
c) furane
d) uracile
e) all answers are not correct

181. Atorvastatin is derivative of:
a) imidazole
b) pyrazole
c) pyrole
d) thiophene
e) all answers are not correct

182. Rosuvastatin is derivative of:
a) chinoline
b) isochinoline
c) pyridine
d) piperidibe
e) answers are not correct

183. Keto group is included in chemical strucrure of:
a) Clofibric acid
b) Ciprofibrate
c) Bezafibrate
d) Fenofibrate
e) all answers are correct

184. In chemical structure of Clofibrate, Bezafibrate, Fenofibrate in included:
a) F atom
b) Cl atom
c) Br atom
d) I atom
e) all answers are correct

185. Clofibrate is the following ester of Clofibric acid:
a) ethyl
b) methyl
c) isopropyl
d) buthyl
e) all answers are not correct

186. According to European Phamacopoeia the volatile related substances in Clofibrate substance are examined by:
a) gas chromatography
b) TLC
c) HPLC
d) UV – spectrophotometry
e) all answers are not correct

187. The number of methyl groups in chemical structure of Ciprofibrate is:
a) 6
b) 5
c) 4
d) 3
e) 2

188. According to European Pharmacopoeia for the visualization of Pyridoxine hydrochloride substance in TLC – test for related substances is used the following reactive:
a) 2.6 – dichlorochinonimine
b) 2.6 – dichlorochinone – chlor – imide
c) 2.6 – dichlorochinoneamine
d) 2.6 – dichlorochinone – chlor – amide
e) all answers are not correct

189. Drugs with pyridine structure are identified with the following reactions:
a) precipitation reactions
b) substitutional reactions
c) formation of complexes with Cu^{2+} salts
d) additional reactions
e) all answers are not correct

190. The included in European Pharmacopoeia imputiry of Pethidine Hydrochloride substance is:
a) 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine
b) 1-ethyl-4-phenyl-1,2,3,6-tetrahydropyridine
c) 1-methyl-4-phenyl-1,2-dihydropyridine
d) 1-methyl-4-phenyl-3,6-tetrahydropyridine
e) all answers are not correct

191. The number of asymmetric C – atoms in chemical structure of Morphine are:
a) 3
b) 5
c) 7
d) 9
e) all answers are not correct

192. Papaverine is derivative of:
a) pyridine
b) chinoline
c) izochinoline
d) piperazine
e) all answers are not correct

193. According to European Pharmacopoeia Fluorouracil Papaverine hydrochloride substance is determined by titration with:
a) hydrochloric acid
b) sodium hydroxide
c) perchloric aocod
d) tetrabuthylamonim hydroxide
e) all answers are not correct

194. According to European Pharmacopoeia Fluorouracil substance is dissolved in dimethylformamide and is determined by titration with:
a) sodium hydroxide
b) tetrabuthylamonim hydroxide
c) sodium nitrite
d) perchloric acid
e) hydrochloric acid

195. The included in European Pharmacopoeia related substance of Fluorouracil substance is
a) sodium hydroxide
b) 5 – hydroxyfluorouracil
c)
d)
e) all answers are not correct

196. β – lactame ring in chemical structute of penicillines is:
a) vety stable
b) opened at influence of water
c) opened at influence ce acids, alkaline solutions and hydroxylamine
d) opened at UV – radiation
e) not opened at influence of acids

197. Penicillins can be identified with:
a) iodophorm sample
b) Vitali – Morin reaction
c) hydroxamic sample
d) murexide reaction
e) all answers are not correct

198. For spectrophotometric determination of Ampicilline substance in derivatization reaction is applied:
a) imidazole – mercury reagent
b) Shiff reagent
c) chromotropic acid
d) Feling reagent
e) all answers are not correct

199. Tetracylcline substance can be identified with:
a) $FeCl_3$
b) hydroxamic sample
c) FeCl3 and hydroxamic sample
d) answers a), b), c) are correct
e) answers a), b), c) are not correct

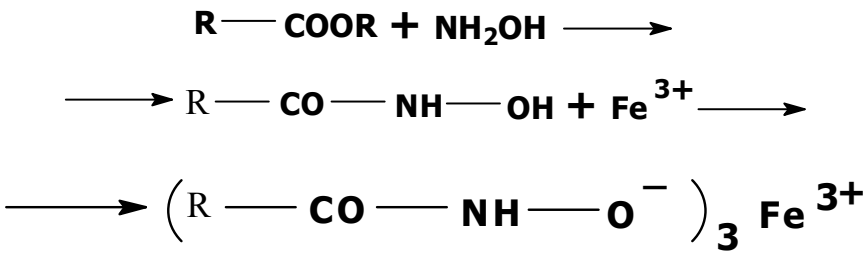
200. Lactones are:
a) Erythromycine
b) Oleandomycine
c) Nystatin
d) Ascorbic acid
e) all answers are correct

STOP TEST FOR PHARMACEUTICAL ANALYSIS

3 POINTS

1. Illustrate the mechanism of jodophorm reaction using ethanol identity test.
2. Express the mechanism of the reaction for identification of phenols with bromine water.
3. Express the reaction for the identification of phenols with indophenol sample.
4. Manifest with the chemical equation the reaction for the identification of phenols by oxidation with nitrous acid.
5. Show the specific reaction for identification of Paracetamol, according to the requirements of European Pharmacopoeia.
6. Express the reactions, on which is based the mechanism of modificated bromato – bromide method for quantification of Resorcinol substance, in accordance with European Pharmacopoeia.
7. Illustrate the reaction for the identification of aldehydes with Fehling's solution.
8. Write the reaction for the identification of drugs containing aldehyde group with Potassium tetraiodomercurate.
9. Show the reaction for the identification of aldehydes with diamminesilver (I) complex.
10. Give with chemical equation the reaction for the identification of drugs containing aldehyde group with Schiff reagent.
11. Express with the chemical equation the reaction, on which is based the method for iodometric determination of Formaldehyde, in accordance with European Pharmacopoeia.
12. Manifest with the chemical equation the conversion of Maleic acid in glyoxylic acid, after obtaining the intermediate product dibromsuccinic acid.
13. Present the transformation of Maleic acid in Maleic anhydride and Fumaric acid.
14. Illustrate the reaction for oxidation of Lactic acid to puruvuc acid and the following decarboxylation.
15. Write the reaction between Lactic acid and ammonia solution at heating.
16. Show the reaction between Salicylic acid and nitric acid to obtain picric acid.
17. Identify the impurity Salcylic acid in Acethylsalicylic acid substance with reactionincluded included in the European Pharmacopoeia

18. Give the name of the following reaction and answer for analysis of what kind of derivatives is used this reaction.



19. Manifest the hydrolysis of substance Acethylsalicylic acid in acid medium.
20. Illustrate the mechanism for jodometric determination of Ascorbic acid substance, according to European Pharmacopoeia.
21. Write the mechanism of reaction for the obtaining of shiff base in test for identification of drugs with primary aromatic amino group with p – dimethylaminobenzaldehyde.
22. Illustrate the mechanism of reaction between primary aromatic amino group, $NaNO_2$ and ß – naphtol.
23. Manifest with the chemical equation the processes, passing off in nitritometric titration of drugs, containing primary aromatic amino group in accordance with European Pharmacopoeia.
24. Write the included in European Pharmacopoeia impurity of Lidocaine.
25. Express with the chemical equation the ninhydrine reaction
26. Express the reaction for identification of thiols with $AgNO_3$.
27. Show the reaction for identification of thiols by oxidation with I_2.
28. Illustrate the chemical formula and the chemical name of Captopril, show it's main impurity and the method for the determination of the impurity.
29. Illustrate with the chemical equation the processes, passing off in titration of Captopril substance in accordance with European Pharmacopoeia:
30. Express the reaction for oxidation of Ranitidine.
31. Illustrate the structures of 3 forms of barbiturates: N^1 – nonsubstituted, N^1 – substituted, S – containing.
32. Give the structures of tautomeric forms of 5.5 – disubstituted barbiturates.
33. Express the hydrolysis of drug – barbituric derivatives, in which structure position (1) is methylated or in position (5) exists voluminous radicals.

34. Show the structure of complex, formed in reaction for the identification of barbiturates, by using of pyridine and $CuSO_4$ solution.
35. Give the structure of complex, obtained in reaction for the identification of unsubstituted at N barbuturates with Co (II) salts.
36. Manifest the structure of complex, formed in reaction for the identification of Barbital c Co (II) salts.
37. Write with the chemical equation the processes, passing off in non – aqueous titration of Phenobarbital with sodium methylate in medium of dimethylforamide.
38. Show with the chemical equation the processes, passing off in aqueous titration of Phenobarbital Soduim.
39. Illustrate the structures of 1.4 – benzodiazepines with lactame and hydroxylactame structure and without O – atom in 2^{nd} position.
40. Illustrate the hydrolysis of 1.4 – benzodiazepines with lactame structure.
41. Express the reaction of interaction between Diazepam and m – dinitrobenzene.
42. Show the destruction of Amitriptylline under heating, light and oxidation.
43. Give the structures of dissociated products, obtained in destruction of Promethazine.
44. Present the changes in chemical structure of Chlorprothixene substance under action of UV – light.
45. Write the tautomeric forms of xanthine.
46. Illustrate the reaction of the alkaline hydrolysis of Caffeine.
47. Manifest with the chemical equation the reaction for the identification of xanthines by murexide sample.
48. Express with the chemical equations the changes in Metamizole sodium structure in acid solution.
49. What is obtained in heating of Atropine with H_2SO_4? Manifest the reaction.
50. Manifest the chemical reaction of Vitali – Morin for the identification of Atropine.
51. Present the reaction, on which is based the non – aqueous determination of Atropine hydrochloride.
52. Give the structures of Adrenaline and of it's oxidation product Adrenochrome.
53. Write the chemical structures of Pylocarpine and of it's impurity pilocarpic acid, which is included in European Phamacopoeia.

54. Present the reaction for the identification of Adrenaline with iodine to obtain adrenochrome.
55. Write the reaction for hydrolysis of Simvastatin substance.
56. Express the hydrolysis of sulphonamide drug products.
57. Express the resonance stability of kations in drugs with imidazole structure.
58. Write the tautomeric forms of Pyridoxine.
59. Manifest with the chemical equation the processes, passing off in nonaqueous titration of Pyridoxine hydrochloride in accordance with European Pharmacopoeia.
60. Express the structure of complex, formed in interaction between Izoniazide and Cu (II) salts.
61. What kind of products obtained from lysergic acids in presence of light. Write the mechanism of the reaction.
62. Illustrate the reaction of interaction between uracile derivatives of and bromine.
63. Show the reaction for jodometric determination of penicillins.
64. Apply the hydroxamic reacinon for the identification of Clofibrate substance.
65. Give the structure of dissociated products, obtained in irradiation of Chloramphenicol with hν – light.