

PUNJAB PUBLIC SERVICE COMMISSION

Competitive Examination (January-2016) for Recruitment of Scientific Officer
(Toxicology) in the Department of Home Affairs & Justice, Punjab

READ INSTRUCTIONS BEFORE FILLING ANY DETAILS OR ATTEMPTING TO ANSWER THE QUESTIONS.

Candidate's Name _____

Father's Name _____

Date of Birth
DD MM YYYY

Category Code*
(*as given in the admit card)

OMR Response Sheet No. _____

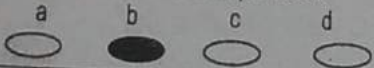
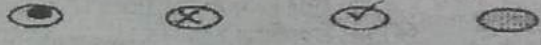
Roll No. _____

Booklet No.

Candidate's Signature (Please sign in the box)

00001022

INSTRUCTIONS

- The candidate shall NOT open this booklet till the time told to do so by the Invigilation Staff. However, in the meantime, the candidate can read these instructions carefully and subsequently fill the appropriate columns given above in CAPITAL letters. The candidate may also fill the relevant columns (other than the columns related to marking responses to the questions) of the Optical Mark Reader(OMR) response sheet, supplied separately
- Use only blue or black ball point pen** to fill the relevant columns on this page. Use of fountain pen may leave smudges which may make the information given by the candidate here illegible.
- The candidate shall be liable for any adverse effect if the information given above is wrong or illegible.
- The candidate must fill all the columns given above on this page and sign at the appropriate place.
- Each candidate is required to attempt 100 questions in 120 minutes**, except for visually impaired candidates, who would be given 20 minutes extra, by marking correct responses on the OMR sheet which would be supplied separately to the candidates
- The candidate must write the following on the OMRs sheet:**
(a)Serial number of OMR sheet supplied to him/her for marking the responses to the questions.
(b)Serial number of the question booklet
Failure to do so may lead to cancellation of candidature or any other action which the Commission may deem fit.
- The candidate should darken the appropriate response to the question by completely darkening the appropriate circle/oval according to his/her choice of response i.e. a, b, c or d in the manner shown in the example below.
a b c d

- Partly darkening the circle/oval on the OMR response sheet or using other symbols such as tick mark or cross would not result in evaluation of the response as the OMR scanner can only interpret the answers by reading the darkened responses in the manner explained in preceding paragraph. Darkening more than one circle/oval as response to a question shall also be considered as wrong answer.
- The candidates shall be responsible to ensure that the responses are marked in correct manner and any adverse impact due to wrong marking of responses would be the responsibility of the respective candidate. The following are some of the **examples of wrong marking** of responses on the OMR response sheet.

- The candidates, when allowed to open the question paper booklet, are advised to check the booklet to confirm that the booklet has complete number of pages, the pages printed correctly and there are no blank pages. In case there is any such error in the question paper booklet then the candidate should immediately bring this fact to the notice of the invigilation Staff and obtain a booklet of the same series as this one.
- The serial number of the new booklet should be entered in the relevant column of the OMR. The candidate should request the Invigilation Staff to authenticate the change in serial number of question booklet by obtaining the initials of the Staff on the corrected serial number of the question booklet
- The question paper booklet has 14 pages.
- Each question shall carry three marks.
- There are four options for each question and the candidate has to mark the most appropriate answer on the OMR response sheet using blue or black ball point pen.
- There is no negative marking for wrong answers or questions not attempted by the candidate.

Scientific Officer (Toxicology)

1. Thiopental is a type of _____ barbiturates.
 - a) Long acting
 - b) Moderate acting
 - c) Short acting
 - d) Very short acting
2. Tetanus like convulsion can also be caused by administration of:
 - a) Brucine
 - b) Morphine
 - c) Strychnine
 - d) Atropine
3. Fujiwara test does not give positive result with:
 - a) Chloral hydrate
 - b) Trichloroethane
 - c) Chloroform
 - d) Ethanol
4. The descending sequence for the toxicity of the pesticides, in general, is:
 - a) Organophosphates > Carbamates > Organochloro > Pyrethroids
 - b) Organophosphates > Organochloro > Pyrethroids > Carbamates
 - c) Organochloro > Phrethroids > Organophosphates > Carbamates
 - d) Phrethroids > Organophosphates > Carbamates > Organochloro
5. The stretching vibration due to C-O bond appears in the IR spectrum at what wave number?
 - a) 900 - 1300 wave number
 - b) 1600 - 1700 wave number
 - c) 2100 - 2400 wave number
 - d) 1000 - 1300 wave number
6. The type of carrier gas used in most applications with Flame ionisation detector (FID) are:
 - a) N_2, H_2
 - b) H_2, He
 - c) N_2, Ar
 - d) Ar, H_2
7. Which one is cumulative poison?
 - a) Opium
 - b) Cannabis
 - c) Calotropis
 - d) Digitalis
8. Heating of Reinsch's tube provides which shape of crystal for arsenic?
 - a) Octahedral
 - b) Needle shaped
 - c) Shining globule
 - d) Hexagonal

9. Which physiologically active compound is not a glycoside?
 a) Cerberin
 b) Calactin
 c) Uscharin
 d) Ricin
10. Some of the substances undergo chemical changes along with the decomposition of tissues in the decomposed biomaterials. Thus which substance is not identifiable by chemical tests in such materials?
 a) Cocaine
 b) Aconite
 c) Chloral hydrate
 d) All of above
11. Which molecule does not absorb in the infrared region:
 a) N_2
 b) H_2O
 c) $-NH_2$
 d) $-OH$
12. The solvents in terms of increasing eluting power are:
 a) Benzene, Chloroform, Cyclohexane
 b) Benzene, Cyclohexane, Diethyl ether
 c) Chloroform, ethyl acetate, acetone
 d) Benzene, methanol, water
13. The gels commonly used in gel-permeation chromatography are in the form of:
 a) Solid supports
 b) Amorphous supports
 c) Gelly support
 d) Liquid support
14. The most common application of the neutron activation analysis (NAA) is the detection of _____ in sample:
 a) Radioactivity
 b) Types of Bonding
 c) Trace metals
 d) Functional groups
15. Which is the correct sequence of poison and associated post-mortem odour/smell from list-1 and list-2 respectively:
- | <u>List-1 (poison)</u> | <u>List-2 (autopsy smell)</u> |
|------------------------|-------------------------------|
| a. Arsenic | i. Bitter almond odour |
| b. Hydrogen sulphide | ii. Garlic odour |
| c. Zinc phosphide | iii. Fishy odour |
| d. Cyanide | iv. Rotten egg odour |
- a) a-iii, b-iv, c-ii, d-i
 b) a-ii, b-iii, c-iv, d-i
 c) a-ii, b-iii, c-i, d-iv
 d) a-ii, b-i, c-iv, d-iii

16. Alcohol and Datura together produce:
- Synergism
 - Tolerance
 - Allergy
 - Sensitivity
17. The part of spectrophotometer that selects the wavelength of light reaching the sample is:
- Nernst Glower
 - Monochromator
 - Photocell
 - Thermocouple

18. Match the instruments with the material analysed:

- List-1**
- Electron Microscope
 - Electrophoresis
 - GLC
 - Comparison Microscope

- List-2**
- Bullet
 - Alcohol
 - Hair
 - Blood

	1	2	3	4
a)	iii	iv	ii	i
b)	i	ii	iv	iii
c)	ii	i	iii	iv
d)	iv	iii	ii	i

19. Assertion (A) :- The drug can be analysed by HPLC
Reason (R) :- Because drug gets precipitate with column
- Both (A) & (R) are correct
 - Both (A) & (R) are incorrect
 - (A) is False but (R) is correct
 - (A) is Correct but (R) is False

20. Identify the right sequence of codes:

- List-1**
- Cobra venom
 - Viper venom
 - Sea snake venom
- a-y, b-z, c-x
 - a-x, b-y, c-z
 - a-y, b-x, c-z
 - a-x, b-z, c-y

- List-2**
- Hemotoxic
 - Neurotoxic
 - Myotoxic

21. When blood is diluted about 20 times with 0.01M Ammonia Solution, a pinkish tinge is observed. This test is used to identify:
- Ethyl Alcohol
 - Methyl Alcohol
 - Carbon dioxide
 - Carbon monoxide
22. A measure of closeness of a test result with its standard known value is known as:
- Precision
 - Standard Deviation
 - Accuracy
 - Average value
23. The technique of chromatography started with separation of which of the following plant pigments:
- Xanthophyll and Chlorophyll
 - Carotene and Lycopine
 - Carotinoid and Phycobilins
 - None of the above
24. Ergot is a vasoconstricting agent which causes convulsions and pain in extremities; is obtained from:
- Claviceps purpurea
 - Digitalis
 - Calotropis gigantea
 - Ricinus communis
25. Insect killer 'baygon spray,' is an example of which of the following group of compound:
- Organophosphates
 - Organochlorines
 - Carbamates
 - Pyrethroids
26. Muffle Furnance is used for isolation of which of the following from biological materials:
- Smack
 - Barbiturate
 - Copper
 - Baygon
27. Which of the following has been widely used as a cattle poison in India:
- Abrus precatorius
 - Cerebrathevetia
 - Claviceps purpurea
 - Chrysanthemum
28. Which of the following is an example of synthetic opioids:
- Morphine
 - Mescaline
 - Fentanyl
 - Codeine

29. Which of the following chemical forms Feathery rosettes crystals with 'Strychnine':
- Mercuric chloride
 - Potassium mercuric iodide
 - Gold chloride
 - Potassium iodide
30. Which of the following poisonous gases found in deep sewerage main hole and gutter:
- Nitrogen
 - Phosgene gas
 - Hydrogen sulphide
 - Chlorine
31. The ratio of Alcohol in blood and alveolar air is approximately:
- 1 : 2100
 - 2100 : 1
 - 1 : 1500
 - 1500 : 1
32. Most common preservatives used for storage of viscera for toxicological examination is:
- Sodium tungstate
 - Sodium fluoride
 - Sodium iodide
 - Sodium chloride
33. Which of the following crosses the blood brain barrier:
- Gamaxene
 - Arsenic
 - Cocaine
 - Aluminium Phosphide
34. Palladium Chloride solution is used for detection of :
- Propoxur
 - Phorate
 - Endosulfan
 - None of the above
35. Wet digestion method is not applied in case of :
- Copper,
 - Zinc
 - Bismuth
 - Mercury
36. Atropine and oxime is used as an antidote for:
- Organophosphorus poisoning,
 - Acid Poisoning,
 - Carbamate poisoning,
 - Organo chloride poisoning

37. NDPS Act was passed in the year:
a) 1939
b) 1968
c) 1985
d) 1950
38. Mercury causes poisoning after:
a) Producing synergism
b) Producing allergy
c) Cumulative action
d) None of the above
39. Collision product peaks are observed in:
a) UV-vis spectrometer
b) IR spectrometer
c) Raman spectrometer
d) Mass spectrometer
40. In X-Ray diffraction the distance between two layers should be same as is followed by:
a) Lambert's law
b) Beer's law
c) Lau's law
d) Bragg's law
41. Which part of the Microscope focuses the light on the object?
a) Body tube,
b) Abbe's condenser
c) Iris diaphragm
d) Coarse focus
42. Beer- Lambert's Law is associated with which phenomenon :
a) Refraction of light
b) Reflection of light
c) Dispersion of light
d) Absorption of light
43. Which element is usually used to produce high energy electron beam in a Scanning Electron Microscope:
a) Aluminium wire
b) Tungsten wire
c) Copper wire
d) Silver wire
44. For recording I.R. spectrum of a compound dissolved in water, the cell should be made of:
a) K Br
b) KCl
c) NaCl
d) AgI

45. In Thin Layer Chromatography technique Dillekoppayani's reagent is used for visualization of:
- Barbiturates
 - Phenothiazines
 - Benzodiazepines
 - Opiates
46. Common substance used as stupefying agent to facilitate robbing or rape is:
- Benzodiazepenes
 - Cocaine
 - Nitrobenzene
 - Aldrin
47. Which of the following is an example of polychlorinated hydrocarbon:
- Malathion
 - Parathion
 - Endrin
 - Diazinon
48. Test for detection of Arsenic poisoning is:
- Marquis test
 - Mandelin's test
 - Marsh test
 - Vitali's test
49. Which of the following is a metabolite of Parathion:
- Malathion
 - Paraxon
 - Mevinphos
 - Chlorophos
50. The poisonous effect of Cyanide on the body is by:
- Forming thiocyanate
 - Inhibiting cytochrome oxidase enzyme
 - Forming cyanomethaemoglobin
 - Combining with -SH group of mitochondrial enzyme
51. Brucine test is conducted for the detection of:
- Nitric Acid
 - Hydrochloric Acid
 - Perchloric Acid
 - Sulphuric Acid
52. "Sindur" used by ladies contains:
- Lead acetate
 - Lead chromate
 - Lead tetraoxide
 - Lead carbonate

53. Leathery stomach is seen in cases of poisoning by :
- Sodium hydroxide
 - Cyanide
 - Copper sulphate
 - Phenol
54. Which one is not a cardiac poison:
- Aconite,
 - Digitalis,
 - Oleander,
 - Strychnine
55. The common poison encountered in Farming community :
- Sodium Cyanide
 - Copper sulphate
 - Aluminium Phosphide
 - Phenobarbital
56. Which of the following is a source of naturally occurring hallucinogens psilocin and psilocybin?
- Poppy plant
 - Marijuana leaves
 - Coca leaves
 - A type of mushroom
57. Which of the following is least likely to be preserved for forensic toxicological analysis:
- Liver
 - Kidneys
 - Pancreas
 - Stomach
58. Which of the following is a predisposing factor leading to substance abuse:
- Whether you are a twin
 - Whether the substance is regularly being abused by other family members
 - Whether you are born in winter
 - Whether the family environment is rural or urban
59. Which mode of administration of a drug is used for most rapid systemic response:
- Oral route
 - Intravenous route
 - Topical application
 - Intramuscular
60. Regarding the drug metabolism, which of the following reaction is a Phase-2 reaction and not a Phase-1 reaction:
- Oxidation
 - Conjugation
 - Reduction
 - Hydrolysis

61. Aluminium in Viscera can be detected using:

- a) Dragendroff's reagent
- b) Morin's reagent
- c) Tollen's reagent
- d) None of the above

62. Match the right sequence of poison and its antidote from list-1 and list- 2 respectively

List-1

- a. Benzodiazepines
- b. Arsenic
- c. Organophosphates
- d. Cocaine

List-2

- i. Pralidoxime
- ii. BAL/ Dimercaprol
- iii. Amyl nitrite
- iv. Flumazenil

- a) a-i, b-ii, c-iii, d-iv
- b) a-iv, b-ii, c-i, d-iii
- c) a-ii, b-i, c-iv, d-iii
- d) a-ii, b-i, c-iii, d-iv

63. The size of the silica gel particles used in High Performance Thin Layer Chromatography plate is:

- a) Less than 10 μm
- b) More than 10 μm
- c) Less than 20 μm
- d) More than 20 μm

64. Which of the following of the electromagnetic spectrum has the lowest wave length?

- a) X-rays,
- b) Infrared
- c) Ultraviolet
- d) Radio waves

65. Phosphine gas is tested in viscera with :

- a) Palladium Chloride
- b) Ammonia
- c) Mercuric bromide paper
- d) Ninhydrin

66. In which of the following instrumental technique, Nuclei acts as a magnetic field for absorbed & re-emitted electromagnetic radiation:

- a) Atomic absorption spectroscopy
- b) Neutron activation analysis
- c) Nuclear magnetic resonance
- d) Energy Dispersive X-ray

67. "Phenanthrene" alkaloids are obtained from which plant?

- a) Datura fastuosa
- b) Cinchona species
- c) Nerium odorum
- d) Papaver somniferum

68. A commonly used insecticide present in All-Out/ mortein is:
- Endrin
 - Senin
 - Pyrethrins
 - Triazine
69. The group/groups of alkaloids found in the latex of poppy plant is/are:
- Phenanthrene
 - Isoquinoline
 - Both a) and b)
 - None of the above
70. Which of the following poisonous plant is also known as *Mitha-Zahar*:
- Strychnos nux vomica*
 - Aconitum napellus*
 - Datura fastuosa*
 - Abrus precatorius*
71. The function of Quadrupole in mass spectrometer is:
- Mass analysis
 - Mass fragmentation
 - Mass detector
 - All of the above
72. STEM is :
- Improved form of SEM
 - Improved from of TEM
 - Combination of SEM and TEM both
 - None of the above
73. Metabolite of Methyl Alcohol is:
- Ether
 - Acetone
 - Acetaldehyde
 - Formaldehyde
74. The formation of histamine in the body is due to:
- Allergy
 - Tolerance
 - Synergism
 - Sensitivity
75. Which of the following is commonly known as "Knock out drops":
- Chloral hydrate
 - Barbiturates
 - Methaqualone
 - Datura

76. The other name of muriatic acid:
- Oxalic acid
 - Carbolic acid
 - Nitric acid
 - Hydrochloric acid
77. Hydrogen sulphide exerts more poisonous effects when administered into:
- Lungs
 - Skin
 - Mouth
 - Rectum
78. Idiosyncrasy, a type of hypersensitivity, is of _____ nature:
- Induced
 - Acquired
 - Inherent
 - None of the above
79. Which drug does not belong to Phenothiazine class of compounds?
- Chlorpromazine
 - Prochlorperazine
 - Promethazine
 - Phencyclidine
80. The Narcotic drugs and Psychotropic substance Act was amended in which year?
- 1984
 - 1985
 - 1986
 - 1988
81. A solid can be studied by IR spectroscopy by making a suitable sample of the solid by:
- Solvent method
 - Mull method
 - Pellet method
 - All of the above
82. The nature of Alumina (a stationary phase) for TLC is generally:
- Acidic by nature
 - Basic by nature
 - Neutral by nature
 - All of the above
83. Gas-Liquid chromatography is an example of:
- Absorption chromatography
 - Adsorption chromatography
 - Partition chromatography
 - Permeation chromatography

84. Reversed phase thin layer chromatography requires the thin layers of adsorbent to be:
- Developed by solvent one by one
 - Coated as thick layer
 - Admixed with some other adsorbent
 - Impregnated with organic solvent before development
85. In Mass spectrum, each line represents the presence of ions of:
- Only one type of atom
 - Only one type of molecule
 - Ionic species of some mass
 - Ionic species of different mass/charge ratio
86. The method of NMR was first developed by:
- Purcell & Felix Bloch
 - DP Hollis
 - Chamberlain & Kolthoff
 - Jungnickel & Forbes
87. The most versatile detector available for GC is:
- FID
 - ECD
 - TCD
 - MSD
88. Fluorescent derivatizing agent commonly used in spectrofluorimetry and HPLC is:
- Rhodamine
 - Dansyl chloride
 - Chloramine
 - Quinine Sulphate
89. Isomers can be separated in HPLC by using:
- Chiral columns
 - Polar columns
 - Non polar columns
 - Semi polar columns
90. The visualization reagent for barbiturates on TLC plate is:
- Diphenylcarbazone
 - Elhrich Reagent
 - Furfural – Sulphuric acid
 - Iodoplatinate
91. Common tests which are done on the urine of sports person is for the presence of:
- Stimulants
 - Anabolic steroids
 - a) and b)
 - barbiturates

92. The elimination of drugs, poisons and their metabolites is facilitated by making them more soluble through conjugation with:
- Glucouronic acid
 - Gluconic acid
 - Amino acids
 - a) and c) above
93. Substances having nearly same lambda max can be differentiated by:
- UV-Vis-spectrophotometry
 - Derivative spectrophotometry
 - HPLC
 - GC
94. Linear temperature programming is used in GC:
- To separate compounds which have close retention times
 - To separate polar compounds from non polar compounds
 - To separate semi polar compounds from polar compounds
 - To separate semi polar compounds from non polar compounds
95. In HPLC of toxicological samples generally we use the columns in the reverse phase:
- C₁₈ bonded silica
 - C₈ bonded silica
 - OV - 17
 - Alumina
96. Permissible blood alcohol limit in India is:
- 80 mg / dL
 - 30 mg / dL
 - 50 mg / dL
 - 100 mg /dL
97. The isolation of a component from TLC plates after separation for other tests is called:
- Isolation Chromatography
 - Preparative chromatography
 - Extraction Chromatography
 - None of these
98. Among the following, which is the least important factor which will affect the R_f value:
- Stationary phase
 - Mobile phase
 - Temperature
 - Development distance
99. A parent peak in a mass spectrum refers to:
- Molecular ion
 - Most abundant ion
 - An ion that has lost two electrons
 - Substance used to calibrate the instrument

100. The heroin may be tested by microcrystal test. It's reaction with mercuric chloride reagent produces which type of microcrystals?
- a) Needle shaped
 - b) Wedge shaped
 - c) Dendrites
 - d) Rectangular shaped
