

ENTRANCE EXAMINATION FOR ADMISSION, MAY 2011.

Ph.D. (TOXICOLOGY)

COURSE CODE : 165

Register Number :

Signature of the Invigilator
(with date)

COURSE CODE : 165

Time : 2 Hours

Max : 400 Marks

Instructions to Candidates :

1. Write your Register Number within the box provided on the top of this page and fill in the page 1 of the answer sheet using pen.
2. Do not write your name anywhere in this booklet or answer sheet. Violation of this entails disqualification.
3. Read each question carefully and shade the relevant answer (A) or (B) or (C) or (D) in the relevant box of the ANSWER SHEET using HB pencil.
4. Avoid blind guessing. A wrong answer will fetch you -1 mark and the correct answer will fetch 4 marks.
5. Do not write anything in the question paper. Use the white sheets attached at the end for rough works.
6. Do not open the question paper until the start signal is given.
7. Do not attempt to answer after stop signal is given. Any such attempt will disqualify your candidature.
8. On stop signal, keep the question paper and the answer sheet on your table and wait for the invigilator to collect them.
9. Use of Calculators, Tables, etc. are prohibited.

1. An individual is previously exposed to penicillin. When he gets exposed to penicillin for a second time, his immune response to penicillin is enhanced. This condition is known as
 - (A) Abnormal toxicity
 - (B) Undue Toxicity
 - (C) Sensitization
 - (D) Irritation
2. Which is the main metabolizing organ in the body?
 - (A) Brain
 - (B) Stomach
 - (C) Small intestine
 - (D) Liver
3. Carboxyhemoglobin is formed in the blood due to the exposure to
 - (A) CO
 - (B) CO₂
 - (C) O₂
 - (D) O₃
4. Organophosphate pesticides are more toxic to man than organochlorine pesticides. True or False?
 - (A) True
 - (B) False
5. 'Itai Itai' disease is caused by
 - (A) Mercury poisoning
 - (B) Cadmium poisoning
 - (C) Cyanide poisoning
 - (D) Nickel poisoning
6. Hydrofluorosis is caused by
 - (A) Abnormal fluoride content in drinking water
 - (B) Abnormal fluoride content in air
 - (C) Abnormal fluoride content in plant leaves
 - (D) Abnormal fluoride content in soil
7. Heavy metals are toxic to the kidney. True or False :
 - (A) False
 - (B) True
8. Venom of one of the below given snakes is neurotoxic. Which one is that?
 - (A) Russell's viper
 - (B) Pit viper
 - (C) Cobra
 - (D) Saw scaled viper
9. It is a regulatory requirement to carryout animal experiments to evaluate the safety of a drug. True or False?
 - (A) True
 - (B) False
10. Approval of Institute's Animal Ethics Committee is a legal requirement to perform experiments in animals. True or False?
 - (A) True
 - (B) False

11. What is 'Minamata' disease?
- (A) Disease caused by mercury poisoning
 - (B) Disease caused by chromium poisoning
 - (C) Disease caused by manganese poisoning
 - (D) Disease caused by magnesium poisoning
12. Which one of the below given enzymes is not considered as a liver function enzyme?
- (A) Alkaline phosphatase
 - (B) Alanine transaminase
 - (C) Aspartate transaminase
 - (D) Amylase
13. The major health hazard of PCBs (Polychlorinated biphenyls) in the environment is
- (A) Hepatotoxicity
 - (B) Nephrotoxicity
 - (C) Cancer
 - (D) Amnesia
14. DDT is not recommended to use for the pest control in these days. The reason for this is
- (A) DDT is very expensive
 - (B) DDT is not very effective in controlling pests like other pesticides
 - (C) DDT is extremely toxic to man
 - (D) DDT is a bioaccumulator and an environmental persistent
15. What is a teratogen?
- (A) A teratogen is an agent that can disturb the development of the embryo or fetus
 - (B) A teratogen is an agent that can disturb the carbohydrate metabolism of the embryo or fetus
 - (C) A teratogen is an agent that can disturb the protein metabolism of the embryo or fetus
 - (D) A teratogen is an agent that can disturb all the metabolisms of the embryo or fetus
16. An antipyretic drug
- (A) Decreases pain
 - (B) Increases pain
 - (C) Decreases body temperature
 - (D) Increases body temperature
17. What is an antidote?
- (A) An agent used to neutralize the effect of a poison
 - (B) An agent used to reduce the acidity of gastric juice
 - (C) An agent used to reduce obesity
 - (D) An agent used to increase appetite

18. Which one is the most toxic chemical to man?
(A) Diazepam (B) Cyanide
(C) Chlopyrifos (D) Mercury chloride
19. Activated charcoal reduces the absorption of the poison by the gut in poisoned victims.
(A) True (B) False
20. What is argyrosis?
(A) Pigmentation of eyes, mucosae and nails in chronic silver poisoning
(B) Pigmentation of brain and spinal cord in chronic copper poisoning
(C) Vertigo due to chronic carbon monoxide exposure
(D) Mesothelioma of pleura due to chronic asbestos exposure
21. Which of the following is associated with the term "Vin Rosé" urine?
(A) Rifampicin (B) Ethanol (C) Iron (D) Thiamine
22. What is a xenobiotic?
(A) Any substance foreign to living systems
(B) A biological product synthesized by the human liver
(C) Excessive biological activity after consuming certain drugs
(D) Scientific name of a frog that secretes toxins
23. Which of the following causes the most severe pain on dermal exposure?
(A) Sulfuric acid (B) Hydrochloric acid
(C) Nitric acid (D) Hydrofluoric acid
24. What is the chemical incorporated in mosquito coils and mosquito liquid vaporizers to repel mosquitoes?
(A) Carbamate (B) Pyrethroid (C) Paraffin wax (D) Acetone
25. "All substances are poisons: there is none which is not a poison. The right dose differentiates a poison and a remedy." Who said this?
(A) Paracelsus (B) Socrates (C) Aristotle (D) Plato
26. Absorption across the skin
(A) occurs equally well across the skin from all parts of the body
(B) occurs predominantly by active transport across the stratum corneum
(C) involves passive diffusion across the dried, keratin-filled cells of the stratum corneum
(D) occurs predominantly via passive diffusion across the hair follicles, sweat ducts, and sebaceous glands

27. Mechanisms that contribute to transmembrane movement of chemicals include all the following EXCEPT
- (A) the process of passive diffusion (B) the process of active transport
(C) the process of biotransformation (D) the process of filtration
28. Absorption of an inhaled gas is usually
- (A) not dependent on dissolution of gas in the blood
(B) dependent on degree of ionization
(C) not dependent on blood flow
(D) dependent on blood-gas partition ratio
29. Toxicology may be defined as the study of
- (A) the degradation of biological warfare agents
(B) the cost of toxicity testing
(C) the adverse effects of chemicals on living systems
(D) the regulation of chemicals in the home
30. Which of the following reactions is NOT considered a phase II biotransformation?
- (A) glucuronidation (B) acetylation
(C) sulfation (D) epoxide hydration
31. Which of the following statements describes the process of active transport?
- (A) The chemical moves from an area of high concentration to an area of low concentration
(B) The chemical moves with an electrochemical gradient through a carrier mediated process
(C) The chemical moves across the membrane through an energy-consuming process
(D) Administration of metabolic inhibitors that block energy production stimulates transport
32. Biotransformation reactions generally produce a product that is
- (A) more likely to distribute intracellularly
(B) more likely to produce unwanted effects
(C) less lipid-soluble than the original chemical
(D) more lipid-soluble than the original chemical
33. Cytochrome P450 monooxygenases catalyze all the following reactions EXCEPT
- (A) sulfation (B) hydroxylation (C) O-dealkylation (D) epoxidation

34. Which of the following statements about hepatic microsomal cytochrome P450 monooxygenase system is false?
- (A) The cytochrome P450 monooxygenase system requires NADPH and molecular oxygen
 - (B) The cytochrome P450 monooxygenase system is involved with exogenous chemicals only
 - (C) The cytochrome P450 monooxygenase system includes N- and O-dealkylations
 - (D) The cytochrome P450 monooxygenase system catalyzes aliphatic and aromatic hydroxylations
35. Conjugation reactions
- (A) always yield an inactive metabolite
 - (B) tend to decrease the molecular weight of many toxicants
 - (C) tend to yield more water-soluble products
 - (D) include hydroxylation and glucuronidation
36. Oogenesis includes
- (A) conversion of spermatogonia into spermatids
 - (B) conversion of an oogonium into four ova.
 - (C) conversion of spermatids into spermatozoa.
 - (D) conversion of an oogonium into one ovum and three polar bodies.
37. Which of the following definitions is correct?
- (A) Mitosis requires nondisjunction for proper cell division.
 - (B) Translation requires conversion of RNA codons into amino acids during protein synthesis.
 - (C) Transcription requires separation of RNA strands with subsequent synthesis of new DNA.
 - (D) Replication requires separation of DNA strands with subsequent synthesis of new RNA.
38. Which of the following terms does NOT describe a mutagenic effect?
- (A) chromatid deletion
 - (B) mitosis
 - (C) polyploid.
 - (D) nondisjunction
39. Histogenesis
- (A) involves the formation of tissues from undifferentiated cells.
 - (B) involves the segregation of cells, cell groups, and tissues into organs.
 - (C) occurs at the same time for all tissues in the organism.
 - (D) is seldom sensitive to the action of carcinogens.

40. Methylation of bases on DNA may
- (A) lead to base recognition errors that lead to point mutations.
 - (B) cause DNA polymerase to act more quickly.
 - (C) induce DNA ligase.
 - (D) lead to cross-linking of mRNA.
41. Excision repair mechanisms that are involved in DNA repair
- (A) are saturable and error-free.
 - (B) are nonsaturable and error-free.
 - (C) are saturable and error-prone.
 - (D) are nonsaturable and error-prone.
42. Glaucoma generally is defined as
- (A) decreased intraocular pressure
 - (B) increased intraocular pressure
 - (C) decreased vitreous humor production
 - (D) increased vitreous humor production.
43. Chemically induced hepatotoxicity may result from
- (A) stimulation of biliary excretion
 - (B) stimulation of biotransformation.
 - (C) stimulation of bile production.
 - (D) stimulation of hepatic blood flow.
44. The skin
- (A) is a fairly permeable barrier to environmental toxicants.
 - (B) is not responsive to UV light.
 - (C) is in a constant state of change as stratum corneum cells typically are replaced monthly.
 - (D) is fairly static as stratum corneum cells typically are not replaced with any regularity.
45. In the eye
- (A) the retina is the layer that brings blood to the rod and cone cells.
 - (B) the lens is the layer that controls pupil diameter.
 - (C) the iris is the white layer that surrounds the eye.
 - (D) the ciliary body is involved in aqueous humor production.

46. The blood-brain barrier
- (A) is a semipermeable barrier that excludes molecules greater than 40 kD.
 - (B) is found around all parts of the brain and spinal cord.
 - (C) is formed by having keratinocytes surround the neurons.
 - (D) is not an effective barrier.
47. Axons
- (A) are involved in receiving messages from other nerve cells.
 - (B) are short extensions of the cell body of the neuron.
 - (C) are fairly tolerant of the toxic effects of chemicals.
 - (D) are involved in the synthesis and release of neurotransmitters.
48. The autonomic nervous system normally does NOT function to
- (A) control heart rate
 - (B) stimulate breathing
 - (C) stimulate skeletal muscle contractions.
 - (D) control pupil diameter.
49. The primary response in humoral immunity is
- (A) An antigen binds to T cells to induce antibody formation.
 - (B) An antigen binds to B cells to induce antibody formation.
 - (C) Interleukins bind to the antigen and stimulate macrophages.
 - (D) Macrophages are stimulated by antigens to induce antibody formation.
50. Which of the following is NOT a common environmental pollutant?
- (A) metals
 - (B) pesticides
 - (C) solvents
 - (D) water.
51. The immune system is composed of all the following EXCEPT:
- (A) serum albumin.
 - (B) interleukins
 - (C) T lymphocytes
 - (D) B lymphocytes.
52. Iron
- (A) inhibits the synthesis of hemoglobin.
 - (B) causes nephrosis on acute exposure.
 - (C) accumulates in the mitochondria and leads to cell necrosis.
 - (D) does not affect the gastrointestinal tract.

53. Autoimmunity may be defined as:
- (A) an increased responsive state acquired through previous exposure to an antigen.
 - (B) a specific acquired immunity in which T lymphocytes are involved.
 - (C) a specific humoral or cell-mediated immune response against the constituents of one's own body.
 - (D) a specific acquired immunity in which interleukins control the process of foreign body destruction.
54. Which of the following definitions is NOT correct?
- (A) Toxicology is the study of the adverse effects of chemicals on living systems.
 - (B) Environmental toxicology evaluates the movement of toxicants through the biophase, as well as toxicant effects on living systems.
 - (C) Teratogenesis is the process of malformations and birth defects that may be induced by toxicants.
 - (D) Mutagenesis is the process of aberrant cell growth and division.
55. Which one of the following functions is NOT performed by the kidney?
- (A) excretion of wastes via the bile.
 - (B) maintenance of acid-base balance.
 - (C) maintenance of electrolyte balance.
 - (D) production of certain endocrine hormones.
56. Which of the following is the most significant contributor to air pollution by mass in suburban areas?
- (A) manufacturing
 - (B) transportation
 - (C) space heaters
 - (D) electric power generation
57. Bioactivation may be defined as
- (A) the process of producing a chemical that is more readily excreted from the body.
 - (B) the process of producing a more toxic chemical by allowing it to interact with DNA.
 - (C) the process by which biotransformation enzymes produce a more reactive chemical.
 - (D) the process by which a chemical stimulates the synthesis of new proteins.
58. Which of the following structures of the kidney is least affected by toxicants?
- (A) glomerulus
 - (B) convoluted tubules
 - (C) loop of Henle
 - (D) ureter

59. Which of the following physicochemical properties of a toxicant is very important to its passive diffusion across membranes?
- (A) molecular weight (B) water solubility
(C) physical state (i.e., solid, liquid, gas) (D) cost.
60. Which of the following statements is NOT true?
- (A) The cornea is the transparent covering of the eye.
(B) The lens is responsible for controlling the diameter of the pupil in response to light
(C) Cataractogenesis is the formation of lenticular opacities.
(D) Glaucoma refers to increased intraocular pressure.
61. Which of the following ionizing radiations has the shortest range (i.e., travels the shortest distance in tissue) for the same initial energy?
- (A) alpha particle (B) beta particle
(C) gamma ray (D) X ray
62. Which of the following is NOT a criterion for a chemical to be called a neurotransmitter?
- (A) The chemical must cause the same response as stimulation of the nerve.
(B) Synthesis of the chemical must be able to occur in the nerve.
(C) The chemical must be present in all nerves.
(D) The nerve must possess the ability to terminate the action of the chemical.
63. Which of the following food additives represents 93 percent of total food additive use?
- (A) butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA)
(B) vitamins.
(C) yeast and leavening agents.
(D) salt, sucrose, dextrose and corn syrup.
64. During the normal process of reproduction, oogenesis
- (A) begins at puberty and continues throughout adult life.
(B) is the period of time during which a mother nurses her young.
(C) is a complex process involving the production of a fertilizable ovum.
(D) occurs daily throughout reproductive life.
65. Which of the following is a toxic effect on the nervous system?
- (A) nephropathy (B) cardiomyopathy
(C) retinopathy (D) axonopathy.

66. Absorption of a chemical from the gastrointestinal tract is NOT influenced by
(A) an individual's dietary patterns. (B) the plasma half-life of the drug.
(C) the pH of the stomach. (D) stress.
67. Which of the following is the quantitatively least important route of toxicant excretion from the body?
(A) bile (B) tears (C) intestine (D) exhalation.
68. Which of the following is NOT a major route for toxicant absorption into the blood?
(A) dermal (B) oral (C) renal (D) ocular.
69. The blood-testes barrier
(A) is very effective in a newborn animal.
(B) is a poor anatomic barrier to chemicals in adult animals.
(C) is more effective than the blood-brain barrier.
(D) protects sertoli, leydig and seminiferous tubular cells.
70. Translation involves
(A) conversion of DNA into RNA (B) conversion of RNA into protein
(C) conversion of protein into RNA (D) conversion of DNA into new DNA
71. Polyploidy occurs when a cell contains
(A) multiple copies of specific RNA
(B) multiple copies of specific DNA
(C) multiple copies of the nucleus of the cell
(D) multiple copies of all chromosomes.
72. Which of the following is NOT a critical period in embryogenesis?
(A) proliferation (B) differentiation (C) organogenesis (D) teratogenesis
73. Agonists are chemicals that
(A) bind to a membrane receptor and prevent a response.
(B) bind to a membrane receptor and initiate a response.
(C) are always poorly bound to a receptor.
(D) exert a response in all tissues in the body.
74. Reabsorption of toxicants does NOT occur through
(A) entero-hepatic recirculation (B) glomerular filtration
(C) diffusion (D) active transport

75. Some Hindu women apply "vermilion" or "sindoor" in the parting of their scalp hair after marriage every day as a symbolic representation of their wedded status. What is the usual composition of this red coloured powder?
- (A) Lead tetroxide (B) Lead oxide
(C) Mercuric chloride (D) Chromium oxide
76. The primary site of excretion of toxic substances is
- (A) Liver (B) Lungs (C) Kidneys (D) Sweat
77. Toxic substances are metabolized in which of the following organs
- (A) Liver, lung, brain, kidney and skin
(B) Kidney, brain, intestines, liver and thyroid
(C) Liver, lung, kidney, skin and adrenal glands
(D) Lung, liver, intestines and pancreas
78. The most important and riskiest route of exposure for toxins in the industrial setting is
- (A) The skin (B) The eyes
(C) The airways (D) The digestive tract
79. The ability of toxins to penetrate the body's defensive barriers is dependent on
- (A) The ionic properties of the substance
(B) The route of absorption
(C) The concentration gradient across the membrane
(D) All the above
80. The active immunologic response evoked as a result of repeated exposures can manifest as
- (A) A simple allergic reaction
(B) An anaphylactic response
(C) An allergic reaction advancing to anaphylaxis
(D) All the above
81. Which of the following chemical reactions are affected by toxins?
- (A) Enzymatic reactions (B) Cellular depression
(C) DNA duplications (D) All the above
82. A hazard can best be defined by which of the following
- (A) The confining and storage of hazardous waste
(B) The transportation of hazardous substances across state lines
(C) Contact between a hazardous substance and the individual
(D) Chemicals regulated by the Clean Air and Water Act

83. Industrial toxicology is the science that studies which of the following
 (A) Adverse effects of industrial substances in humans
 (B) Susceptibility of workers to exposed to industrial strength substances
 (C) All the above
 (D) None of the above
84. A toxic substance has the potential to induce:
 (A) Cancers or tumors
 (B) Irritation of the skin and eyes
 (C) Permanent or transmissible change in developing embryos
 (D) All the above
85. Toxicology can best be defined as:
 (A) The study of chemical agents
 (B) The study of the adverse effects of poisons in living organisms
 (C) The study of poison dipped arrows
 (D) All the above
86. The effect of metformin is
 (A) increased blood glucose level (B) increased insulin release
 (C) reduced insulin release (D) reduced blood glucose levels.
87. The mechanism of action of enrofloxacin involves
 (A) inhibition of topoisomerase (B) inhibition of xylose isomerase
 (C) inhibition of cell wall synthesis (D) inhibition of protein synthesis.
88. The chemical constituent commonly found in the commercially available, in mosquito repellants is
 (A) parathion (B) allethrin (C) amitraz (D) bromadiolone
89. The opioid compound used in combination with atropine sulphate in non-infectious diarrhoea is
 (A) diacetyl morphine (B) pethidine
 (C) loperamide (D) diphenoylate
90. Epinephrine is indicated in
 (A) hypertension (B) allergy
 (C) anaphylaxis (D) asthma
91. GABA is the target of the action of
 (A) phenotiazinee (B) levamisole
 (C) selamectin (D) closantel

92. The mushroom poison amanitin is an inhibitor of
- (A) Protein synthesis (B) mRNA synthesis
(C) DNA synthesis (D) Glycoprotein synthesis
93. Treatment with alloxan destroys the
- (A) Sertoli cells (B) Leydig cells
(C) β - cells of pancreatic islets (D) STH cells
94. Test used to check the carcinogenicity of the chemical is known as
- (A) Paulins test (B) Ames test
(C) Coidal test (D) ELISA test
95. Allopurinol is the drug of choice for the treatment of
- (A) Diabetes mellitus (B) AIDS
(C) Gout (D) Swine flu
96. Isoniazide is an
- (A) Anti tuberculosis drug (B) Antileprosy drug
(C) Anti HIV Drug (D) Antiemetic drug
97. The polyamine is consider as an ideal marker for the assessment of cell destruction is
- (A) Putrescine (B) Spermine
(C) Spermidine (D) None of the above
98. Antidote for cyanide is
- (A) Dicobalt edetate (B) Propranolol
(C) Naloxone (D) Atropine
99. Methotrexate is an inhibitor of
- (A) Pyruvate kinase (B) Folate reductase
(C) Glucokinase (D) None of the above
100. Warfarin inhibits _____ cycle.
- (A) Vitamin K (B) Vitamin A
(C) Vitamin B₁ (D) Vitamin B₁₂