



**OFFICE OF THE ENGINEER-IN-CHIEF
PUBLIC HEALTH ENGINEERING DEPARTMENT
AIZAWL : MIZORAM**

**WRITTEN EXAMINATION
(Advertisement No.3 of 2025)**

**FOR THE POST OF
LABORATORY TECHNICIAN
(Regular)**

PAPER-III

Code No: _____
(For Official Use)

Signature of Invigilator

SUBJECT (Part)	MARKS OBTAINED
Technical/Specialised Subject (100x2=200 marks)	
Total Marks obtained (Full Marks-200)	

Signature of Examiner



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Roll No: _____
(To be filled in by Candidate)

Signature of Candidate

Signature of Invigilator

Instructions: (a) The question paper will also serve as the answer sheet. Candidates are required to answer directly on the question/answer sheet using Tick (✓) Marks.

(b) Time: 3 Hours

LABORATORY TECHNICIAN : PAPER-III (Technical Papers)

(Each question carry 2(two) marks, the total is 200 marks and all question carry equal mark)

1. Best autoclaving is achieved at
(a) 121°C for 15 minutes ☐ (b) 120°C for 1 hour ☐
(c) 110°C for 2 hours ☐ (d) 100°C for 3 hours ☐
2. Acid burn in laboratory accident occurs with the following acid, except
(a) Sulphuric acid ☐ (b) Nitric acid ☐
(c) Acetic acid ☐ (d) Hydrochloric acid ☐
3. The heat of solution or mixing has a negative side.
(a) Heat of solution ☐ (b) Heat of dissolution ☐
(c) Heat of reaction ☐ (d) Heat of mixing ☐
4. What is the valency of carbon?
(a) Pentavalent ☐ (b) Divalent ☐
(c) Trivalent ☐ (d) Tetravalent ☐
5. The organic detergent that is used in hair conditioners
(a) sodium dodecyl benzene sulphonate ☐ (b) sodium lauryl sulphate ☐
(c) cety trimethyl ammonium bromide ☐ (d) tetra methyl ammonium chloride. ☐
6. Why is CNG (Compressed Natural Gas) preferred over petrol?
(a) Burns less efficiently ☐ (b) It is expensive ☐
(c) Can be adulterated ☐ (d) Burns most efficiently ☐
7. How many bases are required for coding 20 amino acids
(a) One ☐ (b) Two ☐
(c) Three ☐ (d) Four ☐
8. What is the ideal pH for growth of most of the bacteria
(a) 6.8- 7.2 ☐ (b) 7.2- 7.6 ☐
(c) 7.6-8.0 ☐ (d) 8.0-8.4 ☐
9. Durham's tube is used to assess
(a) Colour development ☐ (b) Turbidity development ☐
(c) pH ☐ (d) Gas production ☐
10. In the abbreviation SI units, S stands for
(a) Standard ☐ (b) System ☐
(c) Small ☐ (d) Significant ☐
11. Which of the following is not a chemical carcinogen?
(a) Coal-tar ☐ (b) Soot ☐
(c) Asbestos ☐ (d) Heat ☐
12. What are bio-insecticides?
(a) Insects ☐ (b) Living organisms that kill specific insects ☐
(c) Insects that kill other big insects ☐ (d) Fungi ☐
13. Which of the following aqueous solutions would have the highest boiling point ?
(a) 1.0 M NaOH ☐ (b) 1.0 M Na₂SO₄ ☐
(c) 1.0 M NH₄NO₃ ☐ (d) 1.0 M KNO₃ ☐
14. The half-life period of a reaction is constant for:
(a) zero order ☐ (b) first order ☐
(c) second order ☐ (d) none of these ☐
15. Which of the following salts has more conductivity
(a) LiCl ☐ (b) CaCl₂ ☐
(c) LiCl₃ ☐ (d) LiCl and LiCl₃ ☐
16. Hydrolysis of fats by alkali is called
(a) Halogenation ☐ (b) Rancidity ☐
(c) Saponification ☐ (d) Esterification ☐

17. Fungi produce a chemical called
 (a) Testosterone ☐ (b) Pheromone ☐
 (c) Insulin ☐ (d) Growth hormone ☐
18. When a tissue is removed from the body, it begins to
 (a) Compose ☐ (b) Decompose ☐
 (c) Dehydrate ☐ (d) Hydrate ☐
19. Benzene is less dense than
 (a) Alkane ☐ (b) Alkene ☐
 (c) Water ☐ (d) Both Alkane and Alkene ☐
20. Identify the element which undergoes disproportionation in the following reaction.
 $6\text{NaOH} + 3\text{Cl}_2 \rightarrow 5\text{NaCl} + \text{NaClO}_3 + 3\text{H}_2\text{O}$
 (a) Na ☐ (b) O ☐
 (c) Cl ☐ (d) H ☐
21. Reduction never involves:
 (a) gain of electrons ☐ (b) decrease in oxidation number ☐
 (c) loss of electrons ☐ (d) decrease in valency of electropositive component ☐
22. What is the average size of a microbe?
 (a) Less than 1 mm ☐ (b) More than 1 cm ☐
 (c) Less than 0.1 mm ☐ (d) More than 0.1 mm ☐
23. The procedure of chemical safety testing is the same as that used for testing ____ of drugs.
 (a) anatomy ☐ (b) toxicity ☐
 (c) basicity ☐ (d) acidity ☐
24. Replacement of clearing agent with the embedding medium is called
 (a) Dehydration ☐ (b) Embedding ☐
 (c) Impregnation ☐ (d) Clearing ☐
25. The best way to sterilize test tubes, pipette, flasks, petri-dishes is
 (a) Boiling ☐ (b) Tyndallization ☐
 (c) Hot air oven ☐ (d) Steam under pressure ☐
26. The pH of a solution is a measure of its
 (a) Solubility ☐ (b) Ionization energy ☐
 (c) Hydrogen ion concentration ☐ (d) density ☐
27. The order of screening effect of electrons of s, p, d and f orbitals of a given shell of an atom on its outer shell electrons is
 (a) $s > p > d > f$ ☐ (b) $f > d > p > s$ ☐
 (c) $p < d < s > f$ ☐ (d) $f > p$ ☐
28. Which of the following is not a lymphoid tissue?
 (a) Spleen ☐ (b) Tonsils ☐
 (c) Pancreas ☐ (d) Thymus ☐
29. Broad-spectrum antibiotics can kill only a small number of pathogens.
 (a) True ☐ (b) False ☐
30. Gram positive bacteria have a cell wall made up of
 (a) Mycolic acids ☐ (b) Lipopolysaccharides ☐
 (c) Peptidoglycan ☐ (d) Outer membrane containing porins ☐
31. Imprint cytology can be particularly useful in the evaluation of which type of tumor?
 (a) Sarcoma ☐ (b) Lymphoma ☐
 (c) Melanoma ☐ (d) Carcinoma ☐
32. The characteristic colour of lipid droplets stained with Oil Red O is
 (a) Blue ☐ (b) Green ☐
 (c) Red or Orange ☐ (d) Yellow ☐
33. A beaker contains a solution of substance 'A'. Precipitation of substance 'A' takes place when small amount of 'A' is added to the solution. The solution is-
 (a) saturated ☐ (b) supersaturated ☐
 (c) unsaturated ☐ (d) concentrated ☐

34. Activation energy of a chemical reaction can be determined by:
- (a) changing concentration of reactants ☐
- (b) evaluation rate constant at standard temperature ☐
- (c) evaluation rate constant at two different temperatures ☐
- (d) evaluation velocities of reaction at two different temperatures ☐
35. Effect of dilution on conductivity of solution
- (a) Increases ☐ (b) Decrease ☐
- (c) Unchanged ☐ (d) None of the above ☐
36. Which out of the following groups represent auto-immune disorders?
- (a) SCID and diphtheria ☐ (b) Diabetes mellitus (type 1) and rheumatic fever ☐
- (c) AIDS and cholera ☐ (d) Hepatitis and leukaemia ☐
37. _____ organism was used to produce recombinant insulin.
- (a) Cyanobacteria ☐ (b) E.coli ☐
- (c) Saccharomyces cerevisiae ☐ (d) B. subtilis ☐
38. Which of the following is an example of a secondary air pollutant?
- (a) Carbon monoxide (CO) ☐ (b) Sulphur dioxide (SO₂) ☐
- (c) Ozone (O₃) ☐ (d) Lead (Pb) ☐
39. The most common fixative used in histopathology is
- (a) Methanol ☐ (b) Formalin ☐
- (c) Ethanol ☐ (d) Gluteraldehyde ☐
40. Short columnar cells are typically referred to as
- (a) Transitional cells ☐ (b) Squamous cells ☐
- (c) Columnar cells ☐ (d) Cuboidal cells ☐
41. The other name for Beta Thalassemia Major is
- (a) Hemophilia A ☐ (b) Sickle cell Anemia ☐
- (c) Codey's Anaemia ☐ (d) Iron Deficiency Anemia ☐
42. Which salt, when dissolved in water, will produce a basic solution?
- (a) NaCl ☐ (b) KNO₃ ☐
- (c) Na₂CO₃ ☐ (d) NH₄C ☐
43. Which has the highest boiling point?
- (a). 2,3- Dimethylbutane ☐ (b) 2,2- Dimethylbutane ☐
- (c) 2- Methylpentane ☐ (d) 3- Methylpentane ☐
44. Which of the following is not an autoantigen?
- (a) RBCs ☐ (b) Liver Cells ☐
- (c) Acetylcholine receptors ☐ (d) Brain ☐
45. What do we collectively call the biogas producing bacteria?
- (a) Archaeobacteria ☐ (b) Cyanobacteria ☐
- (c) Eubacteria ☐ (d) Methanogens ☐
46. Which elements forms the highest number of compounds?
- (a) Carbon ☐ (b) Hydrogen ☐
- (c) Oxygen ☐ (d) Chlorine ☐
47. Hydrogen peroxide is a _____
- (a) oxidising agent ☐ (b) reducing agent ☐
- (c) both reducing and oxidizing agent ☐ (d) neither reducing nor an oxidizing agent ☐
48. The stain commonly used to detect amyloid deposits in tissues is
- (a) Periodic acid-Schiff ☐ (b) Hematoxylin and eosin ☐
- (c) Congo red ☐ (d) Marson's trichrome ☐
49. Indian ink preparation is used for the identification of
- (a) Bacteria ☐ (b) Parasites ☐
- (c) Fungi ☐ (d) Cryptococcus neoformans ☐

50. Which of the following is not used as a biopesticide?
 (a) *Xanthomonas campestris* ☐ (b) *Bacillus thuringiensis* ☐
 (c) *Trichoderma harzianum* ☐ (d) Nuclear Polyhedrosis Virus ☐
51. Which component of an electrostatic precipitator can remove gases like sulphur dioxide through a spray of water or lime?
 (a) Detergent ☐ (b) Electrode wires ☐
 (c) Corona ☐ (d) Scrubber ☐
52. If a reaction is carried out in acidic medium then which is used to balance the equation?
 (a) H^+ ions ☐ (b) OH^- ions ☐
 (c) H^- ions ☐ (d) O^{2-} ions ☐
53. The addition of NaCl to a saturated solution of AgCl will:
 (a) Increase the solubility of AgCl ☐ (b) Decrease the solubility of AgCl ☐
 (c) Have no effect on the solubility of AgCl ☐ (d) Increase the ionization of AgCl ☐
54. The elements of group 16 are called –
 (a) noble gases ☐ (b) chalcogens ☐
 (c) halogens ☐ (d) alkali metals ☐
55. Which of the following is not a part of the nucleotide?
 (a) Phosphate group ☐ (b) Nitrogenous base ☐
 (c) Pentose sugar ☐ (d) Guanosine ☐
56. In which organism was the “Semiconservative theory of DNA replication” first observed?
 (a) *Treponema pallidum* ☐ (b) *Vibrio cholerae* ☐
 (c) *Staphylococcus pneumonia* ☐ (d) *Escherichia coli* ☐
57. The end product of protein metabolism is
 (a) Urea ☐ (b) Uric acid ☐
 (c) Creatinine ☐ (d) Ammonia ☐
58. The term for the asexual reproductive phase of malarial parasite is
 (a) Gametogony ☐ (b) Sporogony ☐
 (c) Schizogony ☐ (d) Oocyst formation ☐
59. Type of cells commonly found in a transudative effusion are
 (a) Inflammatory cells ☐ (b) Malignant cells ☐
 (c) Mesothelial cells ☐ (d) Macrophages and lymphocytes ☐
60. What is the dominating range of light wavelengths in the lower atmosphere?
 (a) Less than 100 nm ☐ (b) Greater than 300 nm ☐
 (c) Between 100 and 300 nm ☐ (d) All wavelengths are equally present ☐
61. Which drug combination causes decreased insulin effect?
 (a) Barbiturate + Benzodiazepin ☐ (b) Cocaine + antidepressant ☐
 (c) Cocaine + Nicotine ☐ (d) Amphetamine + Insulin ☐
62. The correct order of increasing acidic strength is _____.
 (a) Phenol < Ethanol < Chloroacetic acid < Acetic acid ☐
 (b) Ethanol < Phenol < Chloroacetic acid < Acetic acid ☐
 (c) Ethanol < Phenol < Acetic acid < Chloroacetic acid ☐
 (d) Chloroacetic acid < Acetic acid < Phenol < Ethanol ☐
63. Which of the following statements are applicable to a balanced chemical equation of an elementary reaction?
 (1) Order is same as molecularity (2) Order is less than the molecularity
 (3) Order is greater than the molecularity (4) Molecularity can never be zero
 (a) (2) and (3) ☐ (b) (1) and (4) ☐
 (c) (3) and (4) ☐ (d) (4) only ☐
64. Enzyme present in saliva is
 (a) Amylase ☐ (b) Maltase ☐
 (c) Lipase ☐ (d) Lactase ☐

65. The protein part of functional enzyme is
 (a) Apoenzyme ☐ (b) Cofactor ☐
 (c) Coenzyme ☐ (d) Substrate ☐
66. Bone marrow aspirate should be fixed in
 (a) Formalin ☐ (b) Methanol ☐
 (c) Propanol ☐ (d) Ethanol ☐
67. The unit of equivalent conductivity is
 (a) ohm cm ☐ (b) $\text{ohm}^{-1}\text{cm}^2(\text{g equivalent})^{-1}$ ☐
 (c) $\text{ohm cm}^2(\text{g equivalent})$ ☐ (d) S cm^{-2} ☐
68. Which of the following is not alicyclic:
 (a) Cyclohexene ☐ (b) Cyclobutane ☐
 (c) Toluene ☐ (d) Cyclopentene ☐
69. Acetylene has a characteristic smell resembling that of:
 (a) Rotten egg ☐ (c) Spicy like ☐
 (c) Garlic ☐ (d) None of the above ☐
70. Which of the following is the first developed bio-insecticide?
 (a) Sporeine ☐ (b) Rotenone ☐
 (c) Pyrethrin ☐ (d) Nicotine Sulphate ☐
71. Two bacteria found to be very useful in genetic engineering experiments are _____
 (a) Nitrosomonas and Klebsiella ☐ (b) Nitrobacter and Azotobacter ☐
 (c) Escherichia and Agrobacterium ☐ (d) Rhizobium and Diplococcus ☐
72. Which energy was approved as a non-polluting way for generating electricity?
 (a) Water energy ☐ (b) Nuclear energy ☐
 (c) Solar energy ☐ (d) Soil energy ☐
73. The largest mature leucocytes in the peripheral blood is
 (a) Neutrophils ☐ (b) Eosinophils ☐
 (c) Monocytes ☐ (d) Lymphocytes ☐
74. Ascitic fluid should be transported to the laboratory ideally within
 (a) 30 minutes ☐ (b) 1 hour ☐
 (c) 2 hour ☐ (d) 3 hour ☐
75. During origin of life, _____ was not found in free form?
 (a) Methane ☐ (b) Ammonia ☐
 (c) Oxygen ☐ (d) Hydrogen ☐
76. Methane gas producing field is
 (a) wheat field ☐ (b) paddy field ☐
 (c) cotton field ☐ (d) groundnut field ☐
77. Which of the following is not a redox reaction?
 (a) $\text{Mg} + \text{F}_2 \rightarrow \text{MgF}_2$ ☐ (b) $2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} \rightarrow 6\text{Cu} + \text{SO}_2$ ☐
 (c) $\text{Fe} + 2\text{HCl} \rightarrow \text{FeCl}_2 + \text{H}_2$ ☐ (d) $\text{Na}_2\text{SO}_4 + \text{BaCl}_2 \rightarrow \text{BaSO}_4 + 2\text{NaCl}$ ☐
78. Which of the following pairs can form a buffer solution?
 (a) HCl and NaCl ☐ (b) NH_3 and NH_4Cl ☐
 (c) NaOH and NaCl ☐ (d) H_2SO_4 and KHSO_4 ☐
79. When the temperature rises, what happens to the peak of the curve in the Maxwell Boltzmann distribution graph?
 (a) Shifts forward and upward ☐ (b) Shifts forward and downward ☐
 (c) Shifts backwards and upward ☐ (d) Shifts backwards and downward ☐
80. GEAC stands for:
 (a) Genome Engineering Action Committee ☐
 (b) Ground Environment Action Committee ☐
 (c) Genetic Engineering Appraisal Committee ☐
 (d) Genetic and Environment Approval committee ☐

81. Which environmental phenomenon has been linked to Chlorofluorocarbons (CFCs)?
 (a) Tidal ☐ (b) Aurora Borealis ☐
 (c) Wave Propagation ☐ (d) Ozone Layer Depletion ☐
82. The stain commonly used to detect amyloid deposits in tissues is
 (a) Periodic acid-Schiff ☐ (b) Congo red ☐
 (c) Marson's trichrome ☐ (d) Hematoxylin and eosin ☐
83. Cobalt is only important as a constituent of
 (a) Insulin ☐ (b) Thyroxine ☐
 (c) Vitamin B12 ☐ (d) Haemoglobin ☐
84. The organic detergent that is used in hair conditioners
 (a) sodium dodecyl benzene sulphonate ☐ (b) sodium lauryl sulphate ☐
 (c) cety trimethyl ammonium bromide ☐ (d) tetra methyl ammonium chloride ☐
85. Calcium carbide on reaction with water gives?
 (a) Methane ☐ (b) Ethane ☐
 (c) Propane ☐ (d) Acetylene ☐
86. The first genetically engineered product to be patented was:
 (a) A plant ☐ (b) An animal ☐
 (c) A bacteria (*Pseudomonas putida*) ☐ (d) A human insulin ☐
87. Biotic factors include
 (a) Plants and animals ☐ (b) Water temperature, fish ☐
 (c) Plants, animals and physical environment ☐ (d) None of the above ☐
88. Which of the following is a classification of Organic compounds?
 (a) Alicyclic compounds and acyclic compounds ☐
 (b) Cyclic compounds and alicyclic compounds ☐
 (c) Open chain compounds and acyclic compounds ☐
 (d) Open chain compounds and linear chain compounds ☐
89. Which of the following is neither an acid nor base?
 (a) KCl ☐ (b) CH₃OH ☐
 (c) HCl ☐ (d) CH₃COOH ☐
90. The precursor of thyroid hormones is
 (a) Tyrosine ☐ (b) Alanine ☐
 (c) Arginine ☐ (d) Histidine ☐
91. Visceral peritoneum surrounds the
 (a) Abdominal wall ☐ (b) Organs ☐
 (c) Pelvic bones ☐ (d) Diaphragm ☐
92. A specific stretch of DNA that codes for a particular protein or function is
 (a) Plasmid ☐ (b) Chromosome ☐
 (c) Gene ☐ (d) Genome ☐
93. Which of the following is not a direct factor affecting the rate of a reaction?
 (a) Temperature ☐ (b) Presence of catalyst ☐
 (c) Order of reaction ☐ (d) Molecularity ☐
94. What is the change in the rate of a second order reaction when the concentration of the reactant is increased by 2 times its initial value?
 (a) No change ☐ (b) It doubles ☐
 (c) It triples ☐ (d) It quadruples ☐
95. Which of the compounds are responsible for accelerated eutrophication
 (a) Sulphates (b) Nitrates
 (c) Phosphates (d) Both b and c
96. Which of the following techniques for getting rid of solid waste releases organic contaminants into the environment?
 (a) Landfilling ☐ (b) Incineration ☐
 (c) Phytoremediation ☐ (d) Biological treatment ☐

97. Process of losing electrons is known as
(a) Reduction ☐ (b) Oxidation ☐
(c) Radiation ☐ (d) None of the above ☐
98. How many mL of H₂O must be added to 200 mL of 0.65 M to further dilute the solution to 0.20M?
(a) 450 mL ☐ (b) 500 mL ☐
(c) 550 mL ☐ (d) 600 mL ☐
99. Mendeleev's periodic table is based on-
(a) Atomic number ☐ (b) Increasing order of number of protons ☐
(c) Electronic configuration ☐ (d) None of the above ☐
100. The primary bacterium responsible for bacillary dysentery is-
(a) Salmonella ☐ (b) Shigella ☐
(c) Escherichia coli ☐ (d) Campylobacter ☐

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