

राष्ट्रीय प्रौद्योगिकी संस्थान मिजोरम
NATIONAL INSTITUTE OF TECHNOLOGY MIZORAM
(An Institution of National Importance under the Ministry of HRD, Govt. of India)
Chaltlang, Aizawl - 796 012 (MIZORAM)



**SCHEME OF SYLLABUS FOR COMPETITIVE
EXAMINATION FOR NON-TEACHING
GROUP 'B' & 'C' POSTS**

CONTENT

Sl. No.	Post	Page
1	Technical Assistant	3
2	Accountant	6
3	Junior Engineer	9
4	Superintendent	13
5	Library Information Assistant	15
6	Nurse	18
7	Stenographer	24
8	Junior Assistant	26
9	Technician / Laboratory Assistant / Work Assistant	29
10	Multi-Tasking Staff	31

TECHNICAL ASSISTANT: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 200 marks (Paper-I of 100 marks + Paper-II of 100 marks).

(ii) Candidates securing the minimum qualifying marks in the Competitive Written Examination will be called for Trade Test carrying 50 marks. Trade Test is qualifying nature. Assessment will not be done on the basis of marks for Trade Test.

(iii) Candidates will be recommended for appointment, **in order of merit**, on the basis of their performance in the Competitive Written Examination.

(iv) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination Paper I (Maximum Marks 100)** and **Paper II (Maximum Marks 100)**.

Scheme of Competitive Written Examination and Syllabus: The Competitive Written Examination will consist of **Two Objective Type Papers**, as follows:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

Paper II: Total Marks = 100

Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Diploma Level in Engineering of the concerned Branch	100	40	2 hours	40 minutes

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Paper I

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

Paper II: Concern Subject in Engineering

Questions in this component will be designed at Diploma Level in Engineering of concern Branch.

Trade Test: Candidates who qualify in the Competitive Written Examination will be called for Trade Test. Trade Test is **qualifying nature**. Assessment will not be done on the basis of marks for Trade Test. Questions will be designed to test the candidate's knowledge of concerned subject of specialization.

Subject/Test	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Trade Test – Concerned subject in Engineering	50	15	45 minutes	20 minutes

* PWD Candidates availing scribe / reader / lab. assistant.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Paper - II of Competitive Examination shall be placed higher.
- (ii) Candidates securing higher marks in Part - 'A' of Paper - I of Competitive Examination shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

ACCOUNTANT: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 200 marks (Paper-I of 100 marks + Paper-II of 100 marks).

(ii) Candidates will be recommended for appointment, **in order of merit**, on the basis of their performance in the Competitive Written Examination.

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination Paper I (Maximum Marks 100)** and **Paper II (Maximum Marks 100)**.

Scheme of Competitive Written Examination and Syllabus: The Competitive Written Examination will consist of **Two Objective Type Papers**, as follows:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

Paper II: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	Questions from CA/ICWA/MBA(Finance)	60	25	2 hours	40 minutes
Part B	Computer Proficiency Test	40	15		
TOTAL		100	40		

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Paper I

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

Paper II.

Part-A: Financial Accounting, Accounting Standards, Indirect & Direct – Tax Management, MIS, Costing Techniques, Auditing, Cost & Management Accounting, Financial Management, Management Science, Operation & Project Management Control, Computer Applications in Business, Security Analysis and Investment Management, Management Control System etc.

Part-B: Questions in this component will be designed from Word Processing, Spread Sheet, Computer-Based Accounting Software.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- i) Candidates securing higher marks in Paper - II of Competitive Examination shall be placed higher.
- (ii) Candidates securing higher marks in Part – 'A' of Paper - II of Competitive Examination shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

JUNIOR ENGINEER: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 200 marks (Paper-I of 100 marks + Paper-II of 100 marks).

(ii) Candidates securing the minimum qualifying marks will be recommended for appointment, **depending on the number of vacant post and in order of merit.**

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The Competitive Written Examination will consist of **Two Objective Type Papers** as shown below:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

Paper II: Total Marks = 100

Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Civil Engineering OR Electrical Engineering	100	40	2 hours	40 minutes

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Paper-I

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

PAPER-II:

CIVIL ENGINEERING

Building Materials: Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials e.g. building stones, silicate based materials, cement (Portland), Asbestos products, Timber and Wood based Products, laminates, bituminous materials, paints, varnishes.

Surveying: Principles of surveying, working of prismatic compass and bearings, plane table surveying, theodolite traverse, adjustment of theodolite, levelling and contouring, curvature, refraction correction, permanent adjustment of dumpy level, methods of contouring and uses of a contour map, tachometric survey.

Soil Mechanics: Origin of soil phase diagram, definitions of void ratio porosity, degree of saturation, water content specific gravity of soil grains and unit weights, grain size distribution curves for different soil and their uses. Atterberg's limits, ISI soil classification, plasticity chart, coefficient of permeability, effective stress, consolidation of soils.

Soil: Calculation of shear strength of soils, direct shear test, vane shear test, triaxial test, soil compaction, Lab compaction, Lab compaction test, moisture content and bearing capacity of soils, plate load test, standard penetration test.

Hydraulics: Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.

Environmental Engineering: Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage systems, circular sewers, oval sewer, sewer appurtenances, surface water drainage, sewage treatments.

ELECTRICAL ENGINEERING

Basic Electrical Engineering and Electrical Measurements: Concepts of currents, voltage, resistance, power and energy, their units, Ohm's law.

Circuit Law: Kirchhoff's law, solution of simple network problems, Network theorems and their applications, Electro-magnetism, concept of flux, emf, reluctance, magnetic circuits, Electro-magnetic induction, self and mutual inductance.

A.C. fundamentals, instantaneous, peak, r.m.s. and average values of alternating waves, Equation of sinusoidal wave form, simple series and parallel a.c. circuits consisting of R.L. and C Resonance.

Measurement and measuring instruments, Moving coil and moving iron ammeters and voltmeters, Extension of range, Wattmeters, Multimeters, Megger, Basic Electronics.

Electrical machines: Basic principles of D.C. motors of generators, their characteristics, Speed control and starting of D.C. motors, losses and efficiency of D.C. machines.

1-phase and 3-phase Transformers: Principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. tests, efficiency, auto transformers.

Synchronous machines, generation of three phase emf, armature reaction, Voltage regulation, Parallel operation of two alternators, synchronizing, starting and applications of synchronous motors.

3-phase Induction motor, rotating magnetic field, principle of operation, equivalent circuit, torque speed characteristics, starting and speed control of 3-phase induction motors, Fractional kW motors, 1-phase induction motors, a.c. series motor, reluctance motor.

Generation, Transmission and Distribution: Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, inter connection of power stations.

Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults.

Switchgears-rating of circuit breakers: Principles of arc extinction by oil and air, H.R.C. fuses, earth leakage protection, over current, Buchholz relay, Merz-Prince system of protection of generators & transformers, Protection of feeders and bus bars.

Lightning arresters, Various transmission and distribution systems. Comparison of conductor materials, efficiency for different systems.

Utilization of Electrical Energy: Illumination, electric heating, Electric welding, electroplating, electric drivers and motors.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- i) Candidates securing higher marks in Paper - II of Competitive Examination shall be placed higher.
- (ii) Candidates securing higher marks in Paper - I of Competitive Examination shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

SUPERINTENDENT: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 140 marks (Paper – I of 100 marks and Paper – II of 40 Marks).

(ii) Candidates will be recommended for appointment, **in order of merit**, on the basis of their performance in the Competitive Written Examination and Computer Proficiency Test put together i.e., the sum total of marks scored by the candidate out of 140 marks.

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination: (Maximum Marks 140)**

Paper I of 100 Marks & Paper II of 40 Marks

Scheme of Competitive Written Examination and Syllabus: The Competitive Written Examination will consist of **Two Objective Type Papers**, as follows:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

Paper II: Total Marks = 40

Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Word Processing, Spread Sheet, PPT	40	15	45 mins	20 minutes

INDICATIVE SYLLABUS:

Paper – I:

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

PAPER – II:

Computer Proficiency Test: Questions will be designed to test the candidate's knowledge of Computer Applications for everyday office work like Word Processing, Spread Sheet etc. including usage of internet.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Paper-I in the Competitive Written Examination shall be placed higher.
- (ii) Date of Birth, with older candidate placed higher.
- (iii) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability, the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

LIBRARY INFORMATION ASSISTANT: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying **200 marks** (Paper – I of 100 marks and Paper – II of 100 marks).

(ii) Candidates securing the minimum qualifying marks will be recommended for appointment, **depending on the number of vacant post and in order of merit.**

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The Competitive Written Examination will consist of **Two Objective Type Papers**, as follows:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

Paper II: Total Marks = 100

Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Library Information Science (Theory)	100	40	2 hours	40 minutes

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

PAPER – I:

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision

making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

PAPER – II: THEORY

Unit-I: Library Organization and Administration:

- a) Library in society, concept and role, etc
- b) Fundamentals of Library Planning
- c) Types of Libraries
- d) Laws of Library Science
- e) Library Cooperation
- f) Professional Organisations
- g) Library house keeping operations
- h) Stock verification
- i) Conservation and preservation of Library materials

Unit-II: Information Sources and Services:

- a) Sources of information
- b) Repackaging of information
- c) Reference and information services
- d) Five laws and reference service

Unit-III: Organization of Knowledge:

Library classification

- a) Definition, need and purpose
- b) General theory of classification
- c) Classification schemes.

Library Cataloguing

- a) Definition, need and purpose
- b) Kinds of entries
- c) Dictionary, Classified and Subject cataloguing
- d) Centralised and cooperative cataloguing
- e) Anglo American Cataloguing Rules – 2

Unit-IV, Information Technology:

- a) Fundamentals of Information Technology
- b) Internet
- c) Library Automation
- d) Networking and Telecommunications
- e) Digital Library

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- i) Candidates securing higher marks in Paper - II of Competitive Examination shall be placed higher.
- (ii) Candidates securing higher marks in Part – ‘A’ of Paper - I of Competitive Examination shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

NURSE: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying **200 marks** (Paper – I of 100 marks and Paper – II of 100 marks).

(ii) Candidates securing the minimum qualifying marks will be recommended for appointment, **depending on the number of vacant post and in order of merit.**

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The Competitive Written Examination will consist of **Two Objective Type Paper** as shown below:-

Paper I: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

** PWD Candidates availing scribe / reader / lab. assistant.*

Paper II: Total Marks = 100

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	Fundamentals of Nursing	40	40	2 hours	40 minutes
Part B	Anatomy & physiology, Psychiatric Nursing	30			
Part C	Midwifery and Gynecological Nursing, Pediatric Nursing	30			

** PWD Candidates availing scribe / reader / lab. assistant.*

INDICATIVE SYLLABUS:

PAPER – I:

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

PAPER – II:

Part-A: Fundamentals of Nursing:

- a) Nursing as a profession: Concept of Nursing; Definition of Nursing; Functions of Nurse; Qualities of a Nurse; Comprehensive Nursing care; Holistic approach to Nursing; Code of Ethics and Ethical behaviour expected.
- b) Maintenance of therapeutic Environment: Temperature, light, noise, humidity, aesthetic consideration in the environment, colour scheme, beauty and flower arrangements.
- c) Nursing Process and Nursing Care Plan: Meaning, importance and steps in development.
- d) Admission of a patient: Patients unit set up and care, admission procedure, reception of patient, care of patient's belongings.
- e) Discharging a Patient: Preparation of the patient-physically and mentally; Discharge procedure; Hospital Policies; Preparation of the relatives of the patient for discharge and advice to the patient.

- f) The dying Patient: Signs and symptoms of approaching death; Needs of the dying patient and relatives; Care of dying and last offices; Packing of dead bodies in non communicable and communicable diseases.
- g) Hygienic needs and Physical needs: Importance of maintaining Personal Hygiene; Nurses role in maintaining good personal Hygiene; Factors promoting and inhibiting physical comforts; Comfort devices and their uses; Different position for comfort and positioning of a patient; Principles of lifting and moving patients in bed.
- h) Activity and Exercises: Importance of activity and Exercise in health and sickness, active and passive Exercise.
- i) Safety needs: Environmental hazards, role of nurses in prevention of health hazards.
- j) Elimination needs: Problems in sickness: Constipation, diarrhoea, retention and incontinence of urine; Nurses role in meeting eliminating needs.
- k) Care in Special Condition: Unconscious patient; Patient with fluid imbalance; Patient with Dyspnoea; Physically handicapped; Perineal care of terminally ill-patient with urinary catheter.
- l) Meeting nutritional needs: Importance of Nutrition; Factors effecting nutritional needs.
- m) Observation of Patient: General appearance & deviation; Temperature; Respiration; Heart rate; Blood Pressure; Observation of - Urine, Stool, Vomit, Sputum, Any body fluid
- n) Care of Equipments: Disposable; Re-useable; Rubber goods; Glassware; Enamelware; Metal; Plastic; Furniture; Machinery.
- o) Barrier Nursing: Standard Safety precaution (Universal Precaution); Different types of hand washing; Personal protecting equipments types, uses, techniques of wearing and removing.
- p) Administration of drugs: Purposes of drugs; Routes of administration; Principles: 5 Rights, special consideration, prescription, safety in administering drugs. Storage and maintenance of drugs and nurses responsibility Factors influencing drugs action. Terminologies and common abbreviation used in prescription of drugs.
- q) First Aid: Rules of First Aid, First Aid in emergency situations.

Part-B: Anatomy & Physiology, Psychiatric Nursing:

Anatomy & Physiology:

- a) Skeletal system:
Bones: Types, Structure, Functions; Joints: Classification, Structure and Functions.
- b) Muscular System: Types, Structure, Functions; Position and action of Chief Muscles of the body
- c) Cardio-Vascular System
Blood: Composition, Blood Group, Cross Matching
Heart: Position, Structure, Conduction System, Functions and Cardiac Cycle; Circulation of Blood; Blood Pressure and Pulse; Lymphatic System
- d) Respiratory System: Structure and Functions of Respiratory Organs; Physiology of Respiration; Characteristics of normal Respiration and its deviations
- e) Digestive System: Structure and Functions of Organs; Digestion, absorption and metabolism.

- f) Excretory System: Structure and functions of Organs; Structure and functions of the Skin; Regulation of body Temperature
- g) Nervous System: Type, structure and functions of neuron; Central Nervous System: Structure and Functions.
- h) Endocrine System: Structure and functions of – pituitary, pancreas, thyroid, Parathyroid, Thymus and supra renal glands.
- i) Sense Organs: Structure and functions of eye, ear, nose and tongue; Physiology of Vision, hearing and equilibrium.
- j) Reproductive System: Structure and functions of reproductive and accessory organs; Reproduction, Menstrual Cycle and Menopause; Reproductive Health; Structure and functions of male reproductive system.

Psychiatric Nursing:

- a) Introduction: Meaning of mental illness; Terms used in psychiatry; Etiology of mental illness and contributing factors; Legal aspects in the care of the mentally sick.
- b) Community Responsibility: Attitudes towards mentally ill; Misconceptions towards mentally ill; Health and social service for the mental illness.
- c) Diagnosis: Early recognition of deviations from the normal; Classification of mental disorders; Signs and symptoms of common mental illness.
- d) Management: Physical therapy; drug therapy, shock therapy; Psycho therapy; hypnosis, psychoanalysis; behavior therapy, reactional and social therapy, occupational therapy.
- e) Role of the Nurse: Over active patient; Destructive patient; Suicidal patient; Depression; Withdrawal and Mania; Prevention of accidents amongst mentally ill; Observation reporting and recording; Procedure for admission into and discharge from mental hospitals.

Part-C: Midwifery and Gynaecological Nursing, Paediatric Nursing:

Midwifery and Gynaecological Nursing:

- a) Introduction: Definition: Midwifery, obstetrical Nursing; Development of maternity services in India; Morbidity and mortality rates and their significance; Internal and External organs of reproduction.
- b) Normal Pregnancy: Physiological changes due to pregnancy; Signs, symptoms and diagnosis; Influence of hormones; Pre-natal care: Objectives; History taking; Calculation of Expected date of delivery; Routine Examinations; Care and advice regarding: diet in pregnancy; anti-natal Exercises Minor disorders of pregnancy and alleviations of discomfort; Diseases associated with pregnancy: Cardio vascular; Urinary; Respiratory; Metabolic; Nutritional deficiencies; Sexually transmitted diseases.
- c) Normal Delivery (Preparation): For mother and baby; Preparation of the patient and delivery room-hospital and home; Psychological preparation of mother and family.
- d) Normal labour; Stages of labour; Nursing Management of Baby and birth; Nursing Management of mother during puerperium.

- e) Complications of pregnancy and its management: Bleeding in early pregnancy; Bleeding in late pregnancy; Pregnancy induced hypertension, Pre-Eclampsia, Eclampsia; Hydramnios, Oligohydramnios; Hydatidiform mole; Pelvic inflammatory disease; Intra uterine growth retardation, intra uterine death; Post maturity.
- f) High risk pregnancy and its management: Anaemia, Jaundice, Viral infection; Urinary tract infections; Heart diseases, diabetes mellitus; Osteomalacia; Sexually Transmitted diseases; AIDS; Teenage Pregnancy; Elderly pregnancy; Multi Para & Multiple pregnancy; Un- Educated mother.
- g) Labour Complications: Malpresentations and malpositions; Occipito posterior position; Breach and shoulder; Face and Brow; Cord presentation and prolapse; Obstructed labour;
Ruptured uterus; Post partum haemorrhage, atonic uterus, retained placenta and membranes.
- h) Diseases and disorders of female reproductive system including breasts: Infections; cyst, tumors and fibroids; Abortion; Ectopic pregnancy; Vaginal fistula; Erosion of cervix; Sexually transmission disease; Abnormalities of menstruation; Menopause; Mastitis; Breast abscess; Tumors; Malignancy.

Paediatric Nursing:

- a) Nurses responsibility to meet the nutritional needs; The Infant: Care of umbilical cord, skin, eye, mouth, buttocks and clothings; Disorder of Infants: Vomiting; Diarrhoea; Convulsion; Distension.
- b) Recognition and Management of Congenital anomalies: Causes, Prevention management;
- c) Breast Feeding: Importance and principles; Preparation of mother; Difficulties in breast feeding; Factors inhabiting and promoting lactation.
- d) Diseases of Children: Etiology, Signs and symptoms, medical and surgical management, nursing care, Complication, diet and drug therapy, prevention and treatment with diseases – Gastro- intestinal System, Respiratory System, Genito-urinary System, Cardio Vascular system, Nervous System, Eye and Ear, Nutritional Disorder, Communicable Diseases, Hemotological disorder, Endocrine disorder, Child health Emergencies, Psychological disorder and problems, The Handicapped Child.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Paper - II of the Competitive Examination shall be placed higher.
- (ii) Candidates securing higher marks in Part – ‘A’ of Paper - II of the Competitive Examination shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability, the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

STENOGRAPHER: DIRECT RECRUITMENT

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 100 marks.

(ii) Candidates securing the minimum qualifying marks in the Competitive Written Examination will be called for Stenography Test (Qualifying nature).

(iii) Candidates who qualify in the Stenography Test will be recommended for appointment, **depending on the number of vacant post and in order of merit on the basis of the competitive written examination.**

(iv) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination (Maximum Marks 100)** and **Stenography test (Qualifying nature)**.

A. Scheme of Competitive Written Examination and Syllabus: The Competitive Written Examination will consist of **One Objective Type Paper**, as follows:-

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory Time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current

events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and Scientific Research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

B. Stenography Test: Stenography Test is of **qualifying nature**. Candidates who qualify in the Competitive Written Examination will be called for the Stenography Test.

Category of Candidate	Dictation		Time of Transcription	Maximum permissible error
	Speed	Duration ⁴²		
General Candidate	80 w.p.m	3 minutes	40 minutes	10%
VH Candidate	80 w.p.m	3 minutes	65 minutes	10%

Note:-

1. The matter will have to be transcribed on computer only.
2. There is no exemption from Stenography Test for any category of candidates.
3. The transcription time is including time for reconciliation.
4. The Institute may reduce the qualifying standard to fill up post reserved for various categories only if there are no adequate candidates from the reserved category for which the post is reserved.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Part-C shall be placed higher.
- (ii) Date of Birth, with older candidate placed higher.
- (iii) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

JUNIOR ASSISTANT: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying **Total 140 marks** (Paper-I of 100 marks + Paper-II of 40 marks).

(ii) Candidates securing the minimum qualifying marks in the Competitive Written Examination will be called for Typing Test (Qualifying nature).

(iii) Candidates will be recommended for appointment, **in order of merit**, on the basis of their performance in the Competitive Written Examination of marks scored by the candidate out of **140 marks**.

(iv) Success in the examination confers no right of appointment unless NIT Mizoram is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination (Maximum Marks 140), Typing Test on Computer (Qualifying nature)**.

A. Scheme of Competitive Written Examination and Syllabus: The written examination will consist of **Two Objective Type Papers** as shown below:

Paper – I:

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

** PWD Candidates availing scribe / reader / lab. assistant.*

Paper – II: Computer Proficiency Test

Subject/Test	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Word Processing, Spread Sheet, PPT	40	15	45 minutes	20 minutes

** PWD Candidates availing scribe / reader / lab. assistant.*

INDICATIVE SYLLABUS:

Part-A: General Aptitude & Reasoning: The test will include questions on analogies, similarities and differences, problem solving, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Knowledge: Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observations and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to National Institute of Technology Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Culture, Geography, Economic Scene, General Polity and scientific research.

Part-C: General English: Questions in this component will be designed to test the Candidate's understanding and knowledge of English Language like Error recognition, Fill in the blanks (using verbs, preposition, articles etc.), One word substitution, Improvement of Sentences, Vocabulary, Spellings, Grammar, Sentence Structure, Synonyms, Antonyms, Sentence Completion, Phrases and Idiomatic use of words, Comprehension of Passages.

Typing Test: The Typing Test is of **qualifying nature**. It will be conducted in English to be administered on the Computer using Microsoft Word. The speed requirement is **35 w.p.m.** corresponds to 9000 key depressions per hour.

The speed will be adjudged on the accuracy of typing on the Computer of a given text passage in 10 minutes. Visually Handicapped candidates (with 40% disability and above) will be allowed compensatory time of 20 minutes.

Passage Dictators will be provided to each of VH candidates for the Typewriting test. The Passage Dictators will read out the passage to the VH candidates within the allotted time period.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Paper-II the Competitive Written Examination shall be placed higher.
- (ii) Candidates securing higher marks in Part - 'A' of Paper-I the Competitive Written Examination shall be placed higher
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

TECHNICIAN / LABORATORY ASSISTANT/ WORK ASSISTANT:
DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying total **100 marks**.

(ii) Candidates will be recommended for appointment, **in order of merit**, on the basis of their performance in the Competitive Written Examination.

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. SCHEME OF EXAMINATION: The examination will consist of a **Competitive Written Examination (Maximum Marks 100)** and **Trade Test (Maximum Marks 50)**.

A. SCHEME OF EXAMINATION: The Competitive Written Examination will consist of **One Objective Type Papers**, as follows:-

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Part – A: General Aptitude & Reasoning: The test will include questions on analogies, coding decoding, similarities and differences, problem solving, blood relation, analysis, judgment, decision making, visual memory, relationship concepts, verbal and figure classification, arithmetical number series, non-verbal series, directions, missing numbers, order & ranking etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship and other analytical functions.

Part-B: General Science: Questions in this component will be designed to test the Candidate's understanding and knowledge of General Science like Biology, Physics, Chemistry, Environment etc.

Part-C: General Knowledge: Questions in this component will be aimed at testing the candidates' general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to National Institute of Technology Mizoram, Mizoram, North-Eastern States, India and other countries especially pertaining to Sports, History, Geography, Economic Scene, General Polity, Scientific Research, Award & Honours, Science & Technology, Art & Culture.

Trade Test: Trade Test is of qualifying nature. Candidates who qualify in the Competitive Written Examination will be called for Trade Test. Questions will be designed to test the candidate's knowledge of concerned subject of specialization.

Subject/Test	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Trade Test	50	15	45 minutes	20 minutes

* PWD Candidates availing scribe / reader / lab. assistant.

III. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Part - 'A' in the Competitive Written Examination shall be placed higher.
- (ii) Date of Birth, with older candidate placed higher.
- (iii) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.

MULTI-TASKING STAFF: DIRECT RECRUITMENT EXAMINATION

I. MODE OF SELECTION: The Mode of Selection will be as follows:-

(i) Candidates fulfilling the minimum eligibility conditions will be considered **provisionally eligible** and they will be called for the Competitive Written Examination carrying 100 marks.

(ii) Candidates securing the minimum qualifying marks will be recommended for appointment, **depending on the number of vacant post and in order of merit.**

(iii) Success in the examination confers no right of appointment unless the Institute is satisfied after such enquiry as may be considered necessary that the candidate is suitable in all respects of appointment to the service/post.

II. TRADE TEST: Notwithstanding *Clause I (i)* above, a **Trade Test** with Knowledge of Basic Computer Applications (Word Processing, Spread Sheet etc.)

OR

Driving Test (2 wheeler/Light Vehicle) - under the supervision of MVI, Carrying 50 marks which is of **qualifying nature** will be conducted. Candidates securing 20 marks and above shall be declared qualified for the Competitive Written Examination.

III. SCHEME OF EXAMINATION: The Competitive Written Examination will consist of **One Objective Type Paper** as shown below:-

Part	Subject	Maximum Marks	Minimum Qualifying Marks	Duration	Compensatory time*
Part A	General Aptitude & Reasoning	30	30	2 hours	40 minutes
Part B	General Knowledge	30			
Part C	General English	40			

* PWD Candidates availing scribe / reader / lab. assistant.

INDICATIVE SYLLABUS:

Questions on Numerical Aptitude and General English will be simple, of a level that an average matriculate will be in a position to answer comfortably. Questions on General Awareness will be also of similar standard. Questions on General Intelligence will be non-verbal considering the functions attached to the post.

Part-A: General Aptitude & Reasoning: It would include questions of non-verbal type. The test will include questions on similarities and differences, problem solving, analysis, judgment, decision making, relationship concepts, arithmetical number series, non-verbal series. The test will also include questions designed to

test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

Part-B: General Knowledge: Questions will be designed to test the ability of the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspects as may be expected of an educated person. The test will include questions relating to National Institute of Technology Mizoram and Mizoram especially pertaining to Sports, History, Culture, Geography, Economic scene and General Polity. These questions will be such that they do not require a special study of any discipline.

Part-C: General English: Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure.

IV. RESOLUTION OF TIE CASES: Tie cases will be resolved by applying one after another, as applicable till the tie is resolved, as follows:-

- (i) Candidates securing higher marks in Part-A shall be placed higher.
- (ii) Candidates securing higher marks in Part-C shall be placed higher.
- (iii) Date of Birth, with older candidate placed higher.
- (iv) Alphabetical order in which the names of the candidate appear.

Note:-

1. Pertaining to Persons with Benchmark Disability (PwD), the minimum qualifying marks is relaxable at the discretion of NIT Mizoram, if at any stage of the selection process; the Institute is of the opinion that sufficient number of candidates from the reserved categories are not likely to be available to fill up the vacancy reserved for them.