

**APPROVED SYLLABUS FOR RECRUITMENT OF ASSISTANT DIRECTOR
(FOOD & DRUGS ADMINISTRATION) UNDER HEALTH & FAMILY WELFARE
DEPARTMENT**

- 1) The Examination shall consist of Written Examination and Personal Interview.
- 2) The Written Examination shall comprise of the following papers:

(i) General English	: 100 Marks
(ii) General Studies	: 100 Marks
(iii) Technical Subject Paper – I	: 200 Marks
(iv) Technical Subject Paper – II	: 200 Marks
(v) Technical Subject Paper – III	: 200 Marks
Total	: 800 Marks
- 3) Written examination for each paper will be of 3 hours duration with compensatory time of 20 minutes per hour for persons with benchmarked disabilities or as prescribed by the Government from time to time.
- 4) Question papers for the written examination will be set in English.
- 5) General English will be a mix of conventional essay type and Objective type.
- 6) General Studies will be of Objective/MCQ type.
- 7) 50% of the question papers in Technical Subject Papers I, II and III will be of conventional essay type and 50% will be of Objective/MCQ type.
- 8) Personal interview shall carry 100 marks.

DETAILS OF SYLLABUS

1. GENERAL ENGLISH: 100 MARKS

SUBJECT	TOPIC	MARKS
General English	1. Précis writing	14
	2. Letter writing	10
	3. Comprehension of given passages	10
	4. Grammar: Parts of speech	30
	5. Correct usage and vocabularies	16
	i. Formation of sentences Verbs	20
	<i>Tenses: Present/ Pass forms/ Simple/ Continuous forms, Perfect forms, Future time reference</i>	
	ii. Sentence structure	
	<i>Connectors:</i>	
	<i>Type of Sentences: Affirmative/Interrogative sentences, Negation, Exclamations</i>	
	<i>Types of phrases and Clauses: Finite and non-finite subordinate clauses, noun clauses and phrases, adjective clauses and phrases, adverb clauses and phrases</i>	
	<i>Narration(direct / indirect speech)</i>	
	TOTAL	100



2. GENERAL STUDIES (MCQ): 100 MARKS

SUBJECT	TOPIC	MARKS
General Studies	1. Current events of state, national and international importance	12
	2. History of India and Indian National Movement	12
	3. Indian and World Geography – Physical, Social, Economic Geography of India and the World	12
	4. Indian Polity and Governance – Constitution, Political System, Public Policy, Duties & Rights Issues	12
	5. Economic and Social Development, Sustainable Development, Poverty, Inclusion, Demographics, Social Sector initiatives, and other related issues	12
	6. General issues on Environmental Ecology, Bio-diversity and Climate	12
	7. General Science	
	<i>The topics listed above shall cover the State of Mizoram wherever applicable.</i>	16
	8. General awareness on Mizo culture, its heritage and society	
TOTAL		100

3. TECHNICAL SUBJECT PAPER – I

: 200 MARKS

SUBJECT	TOPIC	MARKS
Pharmaceutics	1. Fundamental knowledge on the formulation, preparation, manufacturing technique, quality control and packaging of different dosage forms such as – Powders, Liquid dosage forms Semisolid, Tablets, Capsules and Parenteral Products.	80
	2. Solubility of drugs, pH, buffers and Isotonic solutions	
	3. Drug stability	
	4. Bioavailability and Bioequivalence: Definition and Objectives of bioavailability, absolute and relative bioavailability, measurement of bioavailability, <i>in-vitro</i> drug dissolution models, <i>in-vitro-in-vivo</i> correlations, bioequivalence studies, methods to enhance the dissolution rates and bioavailability of poorly soluble drugs	
Pharmaceutical Analysis	1. Impurities in pharmaceutical substances: Sources and types of impurities,	60
	2. Fundamental knowledge on the principles, instrumentation, qualitative and quantitative analysis involving with – Precipitation titrations, Complexometric titrations, Gravimetry: UV Visible spectroscopy, Fluorimetry, Atomic absorption spectroscopy, Gas chromatography, High performance Liquid Chromatography	
	3. Calibration and validation	

Signature

Pharmacology	1. Pharmacodynamics – Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors, drug receptors interactions signal transduction mechanisms, G-protein-coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action. 2. Adverse drug reactions 3. Drug interactions (pharmacokinetic and pharmacodynamic) 4. Drug discovery and clinical evaluation of new drugs – Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and Pharmacovigilance 5. Bioassay: Principles and applications of bioassay	60
	TOTAL	200

4. TECHNICAL SUBJECT PAPER – II

: 200 MARKS

SUBJECT	TOPICS	MARKS
Pharmaceutical Jurisprudence	1. Drugs and Cosmetics Act, 1940 and Rules, 1945 2. Pharmacy Act, 1948 3. Narcotic Drugs and Psychotropic Substances Act, 1985 4. Drugs (Price Control) Order, 2013 5. Drugs and Magic Remedies (Objectionable Advertisements) Act, 1954 and Rules, 1955 6. Medical Devices Rules, 2017 7. Medicinal & Toilet Preparations (Excise Duties) Act, 1955 8. Medical Termination of Pregnancy Act, 1971 9. Mizoram Poisons Possession and Sale Rules, 2015	80
Medicinal Chemistry	1. Physicochemical properties in relation to biological action: Ionization, Solubility, Partition Coefficient, Hydrogen bonding, Protein binding, Chelation, Bioisosterism, Optical and Geometrical isomerism 2. Drug metabolism: Drug metabolism principles – Phase I and Phase II. Factors affecting drug metabolism including stereo chemical aspects. 3. Introduction to Drug Design: Various approaches used in drug design. Physicochemical parameters used in quantitative structure activity relationship (QSAR) such as partition coefficient, Hammett's electronic parameter, Taft's steric parameter and Hansch analysis. Pharmacophore modelling and docking techniques.	60

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Pharmacognosy	1. Quality control of Drugs of Natural Origin 2. General introduction, composition, chemistry & chemical classes, biosources, therapeutic uses and commercial applications of following secondary metabolites: <i>Alkaloids:</i> Vinca, Rauwolfia, Belladonna, Opium <i>Phenylpropanoids and Flavonoids:</i> Lignans, Tea, Ruta <i>Steroids, Cardiac Glycosides & Triterpenoids:</i> Liquorice, Dioscorea, Digitalis <i>Volatile oils:</i> Mentha, Clove, Cinnamon, Fennel, Coriander <i>Glycosides:</i> Senna, Aloes, Bitter Almond <i>Iridoids, Other terpenoids & Naphthaquinones:</i> Gentian, Artemisia, taxus, carotenoids 3. Nutraceuticals: Health benefits and role of Nutraceuticals in ailments like Diabetes, CVS diseases, Cancer, Irritable bowel syndrome and various Gastro intestinal diseases. 4. Herbal-Drug and Herb-Food Interactions: General introduction to interaction and classification. Study of following drugs and their possible side effects and interactions: Hypercium, kava-kava, Ginkobiloba, Ginseng, Garlic, Pepper & Ephedra. 5. Evaluation of Drugs WHO & ICH guidelines for the assessment of herbal drugs, Stability testing of herbal drugs 6. Cultivation, Collection, Processing and storage of drugs of natural origin	60
	TOTAL	200

5. TECHNICAL SUBJECT PAPER – III

: 200 MARKS

SUBJECT	TOPICS	MARKS
Industrial Pharmacy and Quality Assurance	1. Good Laboratory Practices: General provisions, Organization and personnel, Facilities, Equipment, Testing Facilities Operation, Test and Control Articles, Protocol for Conduct of a Nonclinical Laboratory Study, Records and Reports, Disqualification of Testing Facilities 2. Document maintenance in pharmaceutical Industry: Batch Formula Record, Master Formula Record, SOP, Quality audit, Quality Review and Quality documentation, Reports and documents, distribution records 3. Regulatory requirements for drug approval 4. Technology development and transfer: WHO Guidelines 5. NABL accreditation Principles and procedures	80

Pharmaceutical Microbiology and Biotechnology	1. Designing of aseptic area, laminar flow equipment; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification. Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids. 2. Assessment of a new antibiotics: a) Brief introduction to Biotechnology with reference to Pharmaceutical Sciences. b) Enzyme Biotechnology – Methods of enzyme immobilization and applications. c) Biosensors – Working and applications of biosensors in Pharmaceutical Industries. d) Brief introduction to Protein Engineering. e) Use of microbes in industry. Production of Enzymes – General consideration – Amylase, Catalase, Peroxidase, Lipase, Protease, Penicillinase. 3. General method of the preparation of bacterial vaccines, toxoids, viral vaccine, antitoxins, serum-immune blood derivatives and other products relative to immunity. a) Storage conditions and stability of official vaccines b) Blood Products: Collection, Processing and Storage of whole human blood, dried human plasma, plasma substitutes.	60
Hospital and Social Pharmacy	1. Drug distribution system in a Hospital: Dispensing of drugs to inpatients, types of drug distribution systems, charging policy and labelling, dispensing of drugs to ambulatory patients, and dispensing of controlled drugs. 2. Therapeutic drug monitoring: Need for Therapeutic Drug Monitoring, Factors to be considered during the Therapeutic Drug Monitoring, and Indian scenario for Therapeutic Drug Monitoring. 3. Medication adherence: Causes of medication non-adherence, pharmacist role in the medication adherence, and monitoring of patient medication adherence. 4. Patient Counselling: Definition of patient counselling; steps involved in patient counselling, and Special cases that require the pharmacist. 5. Preventive medicine: General principles of prevention and control of diseases such as cholera, SARS, Ebola virus, influenza, acute respiratory infections, malaria, chicken guinea, dengue, lymphatic filariasis, pneumonia, hypertension, diabetes mellitus, cancer, drug addiction-drug substance abuse.	60
	TOTAL	200

