Highlighted on Pg. no. 26,31

MGM INSTITUTE OF HEALTH SCIENCES

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COMPETENCY BASED MEDICAL EDUCATION

(CBME)

(with effect from 2019-2020 Batches)

Curriculum for Second M.B.B.S Pharmacology

Amended upto AC-41/2021, Dated 27/08/2021

Amended History

1. Approved as per BOM 57/2019 [Resolution no. 3.1.1.13], Dated 26/4/2019
2. Amended upto BOM 62/2020 [Resolution No. 3.2.2.1], Dated 16/09/2020.
3. Amended upto BOM 63/2021 [Resolution No. 4.4.2.2.i, Resolution No. 4.4.2.2.ii], Dated 17/02/2021.
4. Amended upto AC-41/2021 [Resolution No. 4.19], Dated 27/08/2021.

II[nd] MBBS CBME Curriculum
Pharmacology

Lectures	Practical//Tutorials/Integrated Learning /Seminars / Small group teaching	SDL	TOTAL
80 hrs	141 hrs	12 hrs	233 hrs

List of Lectures			
Number	**COMPETENCY** **The student should be able to**	**Lecture Topics**	**Hours**
	General Pharmacology		
PH1.1	Define and describe the principles of pharmacology and pharmacotherapeutics	Introduction to Pharmacology	1
PH1.9	Describe nomenclature of drugs i.e. generic, branded drugs		
PH1.3	Enumerate and identify drug formulations and drug delivery systems	Routes of administrations	1
PH1.11	Describe various routes of drug administration, eg., oral, SC, IV, IM, SL		
PH1.4	Describe absorption, distribution, metabolism & excretion of drugs	absorption	1
		metabolism	1
PH1.51	Describe occupational and environmental pesticides, food adulterants, pollutants and insect repellents		
PH1.8	Identify and describe the management of drug interactions	Drug interactions and TDM	1
PH1.2	Describe the basis of Evidence based medicine and Therapeutic drug monitoring		
PH1.5	Describe general principles of mechanism of drug action	PD-I	1
		PD-II	1
PH1.6	Describe principles of Pharmacovigilance & ADR reporting systems	ADR	1
PH1.7	Define, identify and describe the management of adverse drug reactions (ADR)		
PH1.63	Describe Drug Regulations, acts and other legal aspects	Drug Regulations and Schedules	1

PH1.64	Describe overview of drug development, Phases of clinical trials and Good Clinical Practice	Drug development processand GCP	1
PH1.60	Describe and discuss Pharmacogenomics and Pharmacoeconomics	Pharmacogenomics and Pharma coeconomics	1
		Total Hours	11

Number	COMPETENCY The student should be able to	lecture topics	Hours
	Autonomic Nervous System		
PH1.13	Describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and anti-adrenergic drugs	Adrenergic agonists	1
		Alpha blocker	1
		Beta Blocker	1
PH1.14	Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs	Cholinergic agonists and Anti-cholinesterases	1
		Anticholinergics	1
	Total Hours		**5**
	Autacoids and Related Drugs		
PH1.16	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act by modulating autacoids, including: anti-histaminics, 5-HT modulating drugs, NSAIDs, drugs for gout, anti-rheumatic drugs, drugs for migraine	NSAIDS-I and II	2
		anti-histaminics	1
		5-HT modulating drugs and drugs for migraine	1
		Drugs for gout, anti-rheumatic drugs,	1
	Total Hours		**5**
	Drugs acting on Peripheral Nervous System		
PH1.15	Describe mechanism/s of action, types, doses, side effects, indications and contraindications of skeletal muscle relaxants	Skeletal Muscle Relaxants	1
PH1.17	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of local anesthetics	Local Anesthetics	1
		Total Hours	2
	CNS		
PH1.18	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of general anaesthetics, and pre- anesthetic medications	General Anesthetics	1
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti- depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for	sedatives & hypnotics	1
		anxiolytics	1
		anti-psychotic	1

	neurodegenerative disorders, anti-epileptics drugs)	anti- depressant drugs and anti-maniacs	1
		opioid agonists and antagonists	1
		drugs used for neurodegenerative disorders	1
		anti-epileptics drugs	1
		Total Hours	**8**

	Drugs acting on Kidney		
PH1.24	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs affecting renal systems including diuretics, antidiuretics- vasopressin and analogues	Diuretics and antidiuretics	1
	Drugs affecting Blood and Blood Formation		
PH1.25	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs acting on blood, like anticoagulants, antiplatelets, fibrinolytics, plasma expanders	Coagulants and anticoagulants	1
		Antiplatelets and fibrinolytics	1
		plasma expanders and Rx of shock	1
PH1.35	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in hematological disorders like: 1.Drugs used in anemias 2.Colony Stimulating factors	Haematinics and Erythropoietin	1
		Total Hours	**4**
	Cardiovascular drugs		
PH1.26	Describe mechanisms of action, types, doses, side effects, indications and contraindications of the drugs modulating the renin- angiotensin and aldosterone system	Drugs affecting renin- angiotensin and aldosterone system	1
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	Antihypertensive drugs	1
PH1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease	Antianginal drugs and Drugs for Myocardial infarction	2

PH1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure	Cardiac glycosides	1
		Drugs for Heart failure	1
PH1.30	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the antiarrhythmics	Antiarrhythmic drugs	1
		Total Hours	**7**

	Respiratory System Drugs		
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD	Drugs used in bronchial asthma and COPD	1
		Total Hours	**1**
	Gastrointestinal Drug		
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 1. Acid-peptic disease and GERD 2. Antiemetics and prokinetics 3. Antidiarhoeals 4 .Laxatives 5. Inflammatory Bowel Disease 6. Irritable Bowel Disorders, biliary and pancreatic diseases	Acid-peptic disease and GERD	1
		Antiemetics and prokinetics	1
		Total Hours	**2**
	Hormones and Related Drugs		
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)	Thyroid Hormones and Thyroid Inhibitors	1
		Insulin	1
		Oral hypoglycemic agents	1
		Hormones and Drugs affecting calcium balance	1
PH1.37	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used as sex hormones, their analogues and anterior Pituitary hormones	Introduction & Anterior Pituitary hormones	1
		Estrogens & antagonists	1
		Progestins & antagonists	1

PH1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception	Oral contraceptives & Pro-fertility agents	1
PH1.40	Describe mechanism of action, types, doses, side effects, indications and contraindications of 1. Drugs used in the treatment of infertility, and 2. Drugs used in erectile dysfunction	Androgens and Erectile Dysfunction	1
PH1.38	Describe the mechanism of action, types, doses, side effects, indications and contraindications of corticosteroids	Corticosteroids	2
PH1.41	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of uterine relaxants and stimulants	Oxytocin and Other Drugs acting on Uterus	1
		Total Hours	**12**

	Antimicrobial Drugs		
PH1.42	Describe general principles of chemotherapy	Antimicrobial agents: General Considerations	1
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	Penicillins	1
		Cephalosporins & other beta lactums	1
		Aminoglycosides	1
		Fluoroquinolones	1
		Macrolides	1
PH1.44	Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses.	Antitubercular drugs	1
PH1.45	Describe the dugs used in MDR and XDR Tuberculosis		
PH1.46	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antileprotic drugs	Antileprotic agents	1
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	Antimalarial agents	2
		Antiameobic & Other antiprotozoal Drugs	1

		Antihelminthics	1
PH1.55	Describe and discuss the following National Health Programmes including Immunisation, Tuberculosis, Leprosy, Malaria, HIV, Filaria, Kala Azar, Diarrhoeal diseases, Anaemia & nutritional disorders, Blindness, Non-communicable diseases, cancer and Iodine deficiency		
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	Antifungal agents	1
		Antiviral agents	1
		Pharmacotherapy of STDs	1
		Pharmacotherapy of UTI	1
PH1.62	Describe and discuss antiseptics and disinfectants		
PH1.49	Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs	Anticancer Drugs	1
		Total Hours	**17**

	Miscellaneous Topics		
PH1.50	Describe mechanisms of action, types, doses, side effects, indications and contraindications of immunomodulators and management of organ transplant rejection	Immunomodulators and vaccines	1
PH1.54	Describe vaccines and their uses		
PH1.52	Describe management of common poisoning, insecticides, common sting and bites	General Principles of Management of Poisoning	1
PH1.53	Describe heavy metal poisoning and chelating agents		
PH1.56	Describe basic aspects of Geriatric and Pediatric pharmacology	Geriatric and Pediatric pharmacology	1
PH1.57	Describe drugs used in skin disorders	Drugs acting on skin and mucous membrane	1
PH1.58	Describe drugs used in Ocular disorders	Ocular Pharmacology	1
PH1.59	Describe and discuss the following: Essential medicines, Fixed dose combinations, Over the counter drugs, Herbal medicines	Essential medicines, Herbal medicines and nutraceuticals	1
PH1.61	Describe and discuss dietary supplements and nutraceuticals		
		Total hours	**6**
		Grand Total Teaching hours	**80**

List of Practical//Tutorials/Integrated Learning /Seminars / Small group teaching Topics

Number	COMPETENCY The student should be able to	Practical//Tutorials/Integrated Learning /Seminars / Small group teaching Topics	Hours
	Practical's		
PH1.10	Describe parts of a correct, complete and legible generic prescription. Identify errors in prescription and correct appropriately	Prescription Writing	**2**
PH5.7	Demonstrate an understanding of the legal and ethical aspects of prescribing drugs		
	Practical's		
	Clinical Pharmacy		
PH2.1	Demonstrate understanding of the use of various dosage forms (oral/local/parenteral; solid/liquid)	Introduction to Practical Pharmacology	2
		Route of Administration-Oral	2
		Introduction to Pharmacy Pharmacy preparations (Solution, suspension, emulsion)	6
		Route of Administration-Topical	2
		Pharmacy preparations (Lotion, Liniment, Ointment)	6
		Route of Administration-Parental	2
PH2.3	Demonstrate the appropriate setting up of an intravenous drip in a simulated environment	Skill lab	2
PH2.2	Prepare oral rehydration solution from ORS packet and explain its use	Pharmacy preparation (ORS Powder)	2

PH2.4	Demonstrate the correct method of calculation of drug dosage in patients including those used in special situations	PK-I	2
		PK-II	2
	Clinical Pharmacology		
PH3.1	Write a rational, correct and legible generic prescription for a given condition and communicate the same to the patient	Single drug therapy	2
		Multiple drug therapy	4
		Fixed drug combination	2
PH3.2	Perform and interpret a critical appraisal (audit) of a given prescription	Criticism of prescription	4
PH3.3	Perform a critical evaluation of the drug promotional literature	Sources of Drug Information including scrutiny of Promotional Literature	4
PH3.6	Demonstrate how to optimize interaction with pharmaceutical representative to get authentic information on drugs	Skill lab	
PH3.4	To recognise and report an adverse drug reaction	ADR-I	2
		ADR-II	2
		ADR Reporting system and forms	2
		Subjective & Objective effects of Drugs	
PH3.5	To prepare and explain a list of P-drugs for a given case/condition	Rational Pharmacotherapy I	2
		Case Study-I	2
		Case study-II	2
		Rational Pharmacotherapy II	2
PH3.7	Prepare a list of essential medicines for a healthcare facility	National essential drug list	2
PH3.8	Communicate effectively with a patient on the proper use of prescribed medication	Skill station: Steps for drug delivery (Topical and Inhalational)	2

	Experimental Pharmacology		
PH4.1	Administer drugs through various routes in a simulated environment using mannequins	Skill lab-Parenteral routes	2
PH4.2	Demonstrate the effects of drugs on blood pressure (vasopressor and vaso-depressors with appropriate blockers) using computer aided learning	Screening Techniques for New Drugs	2
		PD-I	2
		PD-II	2
		CAL based learning	2
		CAL based learning	2
		CAL based learning	2
	Total hours: 76		
	Tutorials/Small group Teaching		
PH1.4	Describe absorption, distribution, metabolism & excretion of drugs	Distribution	1
		Excretion	1
		Kinetics of Elimination	1
PH1.5	Describe general principles of mechanism of drug action	Factors modifying Drug actions	1
PH1.13	Describe mechanism of action, types, doses, side effects, indications and contraindications of adrenergic and anti-adrenergic drugs	Adrenergic agonists	1
PH1.14	Describe mechanism of action, types, doses, side effects, indications and contraindications of cholinergic and anticholinergic drugs	Anticholinesterases and Rx of Organophosporus poisoning	1
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program	Sulphonamides and Cotrimoxazole	1
		Tetracyclines & Chloramphenicol	1

PH1.49	Describe mechanism of action, classes, side effects, indications and contraindications of anticancer drugs	Anticancer Drugs	1
PH5.2	Communicate with the patient regarding optimal use of a) drug therapy, b) devices and c) storage of medicines	Rational Pharmacotherapy-I	1
PH5.3	Motivate patients with chronic diseases to adhere to the prescribed management by the health care provider		
PH5.4	Explain to the patient the relationship between cost of treatment and patient compliance		
PH5.6	Demonstrate ability to educate public & patients about various aspects of drug use including drug dependence and OTC drugs	Rational Pharmacotherapy-II	1
		Total Hours	11
	Seminars		
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD	Bronchial Asthma	2
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	Hypertension	2
PH1.29	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in congestive heart failure	CCF	2
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti- depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)	Treatment of Epilepsy	2

PH1.28	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in ischemic heart disease (stable, unstable angina and myocardial infarction), peripheral vascular disease	Angina Pectoris	2
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti- depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)	Parkinson's disease	2
PH1.19	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs which act on CNS, (including anxiolytics, sedatives & hypnotics, anti-psychotic, anti- depressant drugs, anti-maniacs, opioid agonists and antagonists, drugs used for neurodegenerative disorders, anti-epileptics drugs)	Pain Management	2
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis)	Diabetes	2
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis	Malarial	2
PH1.44	Describe the first line antitubercular dugs, their mechanisms of action, side effects and doses.	TB	2
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	UTI	2
PH1.23	Describe the process and mechanism of drug deaddiction	Drug addiction & Over Dose Toxicity	2

PH1.39	Describe mechanism of action, types, doses, side effects, indications and contraindications the drugs used for contraception	Contraception	2
PH1.48	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in UTI/ STD and viral diseases including HIV	HIV	2
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 4. Acid-peptic disease and GERD 5. Antiemetics and prokinetics Antidiarrhoeals 4 .Laxatives 7. Inflammatory Bowel Disease Irritable Bowel Disorders, biliary and pancreatic diseases	Peptic Ulcer	2
Total Hours			30
	Integrated Topics		
PH1.12	Calculate the dosage of drugs using appropriate formulae for an individual patient, including children, elderly and patient with renal dysfunction. **(Pediatrics and Medicine)**	Dose modification in special conditions- children Dose modification in special conditions- elderly Dose modification in special conditions- patient with renal dysfunction	1
PH1.20	Describe the effects of acute and chronic ethanol intake **(Psychiatry)**	Ethyl and methyl alcohol	1
PH1.21	Describe the symptoms and management of methanol and ethanol poisonings **(Medicine)**	Management of methanol and ethanol poisonings	1

PH1.22	Describe drugs of abuse (dependence, addiction, stimulants, depressants, psychedelics, drugs used for criminal offences)	CNS stimulants and Cognition Enhancers	1
PH1.23	Describe the process and mechanism of drug deaddiction **(Psychiatry, Medicine)**	Principles of Deaddiction	1
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock **(Medicine)**	Rx of Shock	
PH1.31	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in the management of dyslipidemias **(Medicine)**	Hypolipidemic agents	1
PH1.32	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of drugs used in bronchial asthma and COPD **(Respiratory Medicine)**	Bronchial asthma	1
PH1.33	Describe the mechanism of action, types, doses, side effects, indications and contraindications of the drugs used in cough (antitussives, expectorants/ mucolytics) **(Respiratory Medicine)**	Drugs for Cough	1
PH1.34	Describe the mechanism/s of action, types, doses, side effects, indications and contraindications of the drugs used as below: 6. Acid-peptic disease and GERD 7. Antiemetics and prokinetics 3.Antidiarrhoeals 4 .Laxatives 8. Inflammatory Bowel Disease	Anti diarrhoeals and Inflammatory Bowel Disease Irritable Bowel Disorders, biliary and pancreatic diseases	1
		Laxatives	1

	Irritable Bowel Disorders, biliary and pancreatic diseases **(Medicine)**		
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program **(Microbiology, Pediatrics, Medicine)**	Antibiotic stewardship program	1
PH5.1	Communicate with the patient with empathy and ethics on all aspects of drug use **(Medicine)**	Bioethics-I	1
		Bioethics-II	1
PH1.45	Describe the dugs used in MDR and XDR Tuberculosis **(Respiratory Medicine, Microbiology)**	Tuberculosis	1
PH1.47	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of the drugs used in malaria, KALA-AZAR, amebiasis and intestinal helminthiasis **(General Medicine, Microbiology)**	Malaria	1
PH1.36	Describe the mechanism of action, types, doses, side effects, indications and contraindications of drugs used in endocrine disorders (diabetes mellitus, thyroid disorders and osteoporosis) **(Medicine)**	Diabetes Mellitus	1
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program **(Microbiology, Pediatrics, Medicine)**	Typhoid	1
PH1.43	Describe and discuss the rational use of antimicrobials including antibiotic stewardship program **(Microbiology, Pediatrics, Medicine)**	Meningitis	1

PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	Hypertension	1
PH1.27	Describe the mechanisms of action, types, doses, side effects, indications and contraindications of antihypertensive drugs and drugs used in shock	Myocardial Infarction	1
		Total Hours	21
	Topics for Practical//Tutorials/Integrated Learning /Seminars / Small group teaching	Grand total hours	138

Pandemic Management Topics in Pharmacology

Module	Broad areas	Competencies under which covered
2.5	Therapeutic strategies including new drug development	**PH1.64** Describe overview of drug development, Phases of clinical trials and Good Clinical Practice **Learning Experience** i. Exploratory and interactive theory session- 1 hour ii. **Small Group Discussion**- 2 hours Suggested Topics for discussion- New Drug Development – Challenges and Solutions – Urgency in procedures – Need for monitoring. iii. **Visit to a pharmaceutical firm/ pharmacy lab** to show various stages of drug development or an ADR monitoring exercise in clinical wards - 2 hours. (since it is not present in many cities - an appropriate video followed by discussion)- 2 hours iv. Discussion and closure – 1 hour **Total Extra hours needed to cover Pandemic Module: 3 Hours**

Self-Directed Learning Topics

Number	COMPETENCY/Systems	Self Directed Learning Topics	Hours
1	Ph. 1.1 General consideration of sympathetic system	Introduction to Sympathetic system	**2**
2	Ph 1.14 General consideration of parasympathetic system	Introduction to parasympathetic system	**2**
3	Ph 1.20 Acute and Chronic alcohol intake	Acute and Chronic alcohol intake	**2**
4	Ph 1.22 Drug abuse	Drug abuse	**2**
5	Ph 1.34 inflammatory Bowel disease, Irritable bowel disorders, Billiary and pancreatic diseases	Inflammatory Bowel disease, Irritable bowel disorders, Billiary and pancreatic diseases	**2**
6	Ph. 1.32 Management of bronchial asthma	Management of bronchial asthma	**2**
Total Hours: 12 hours			

Resolution No. 3.2.2.1 of BOM-62/2020: Resolved to approve the restructured Formative and Summative assessment pattern for 2nd MBBS Para-Clinical disciplines (Microbiology, Pathology, Pharmacology and FMT) which is in line with Competency Based Medical Education (CBME) curriculum guidelines as mandated by MCI. **[Annexure-46A, 46B, 46C, 46D]**

Format for Internal assessment examinations

Sr. No.	Exam	Theory	Practical
1.	1st Internal assessment examination	100	100
2.	2nd Internal assessment examination	100	100
2.	Preliminary examination	200	100
Total		**400**	**300**

- Preliminary examination pattern will be as per University examination
- Respective colleges/ departments will conduct internal assessment examinations andmaintain records of the same.

Format for Internal assessment examinations

Sr. No.	Exam	Theory	Practical
1.	Internal assessment examinations	200	200
2.	Preliminary examination	200	100
Total		**400**	**300**

Format of question paper

Time – 3 hrs. : _____

Preliminary / University examination

Each subject –2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Unit I & II **–**1 paper **= 100 marks**

Each paper –

- **Section A** –MCQ – 20 X 1 mark = **20 Marks**
- **Section B** –
    - Answer any 5 out of 6 SAQ = **30 Marks**
    - Any one out of 2 LAQ (Structure LAQ to be made) = **10 marks**

➢ **Note: 1 AETCOM SAQ**

- **Section C** –
    - Any 5 out of 6 SAQ = **30 marks**
    - Any one out of 2 LAQ (Structure LAQ to be made) = **10 marks**

➢ **Note: At least 1 LAQ should be there clinically based.**

Format of question paper

Time – 3 hrs. **Preliminary &University**

Applicable from 2020-21 Batch onwards

Each subject – 2 papers (I / II) – 100 X 2 = **Total 200 Marks**

Portion:

Paper 1	General Pharmacology including drug – drug interactions, Autonomic Nervous System, Cardiovascular System including drugs affecting Coagulation and those acting on the Kidneys; Haematinics; Agents used in Gastro – Intestinal Disorders; Ocular Pharmacology; Drug use at extremes of age, in pregnancy & in organ dysfunction; Diagnostic & Chelating agents; Environmental & Occupational Pollutants; Vitamins AETCOM Module 2.2
Paper 2	Neuro – Psychiatric Pharmacology including Antiinflammatory – Analgesics and Addiction & its management; Pharmacology in Surgery (Particularly per – operative management), Chemotherapy including Cancer Chemotherapy; Endocrinology; Dermatology ; Miscellaneous topics I (Lipid – derived autacoids; Nitric Oxide; Allergy – Histamines & Antihistamines including anti – vertigo, Anti Asthmatics; Anti – tussive agents; Immunomodulators, Vaccines & sera; Drugs acting on the uterus) AETCOM Module 2.7

Theory Paper Pattern and Marks Distribution:

Paper	Section	Type and Number of Questions	Marks alloted	Total Marks
Paper 1	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each = 30 Mks 1X 10 Mks each=10 Mks	40
	Section C	SAQs (5/6)	5X 6 Mks each =30 Mks	40

		LAQs (1/2) (Atleast 1 LAQ clinical Based)	 1X 10 Mks each=10 Mks	
			TOTAL	**100**
Paper 2	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
	Section C	SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
			TOTAL	**100**

CBME II MBBS Pharmacology

Blue Print of MCQs Topic vise weightage for Preliminary and University Examination

Paper – I

Sr. No	Topics	No of MCQ
1	General Pharmacology	3
2	ANS	4
3	CVS	4
4	Blood	3
5	Kidney	1
6	GIT	3
7	Ocular drugs, Chelating agents, Vitamins	2
	Total	20

Paper – II

Sr. No	Topics	No of MCQ
1	CNS and Autocoids	6
2	Chemotherapy	7
3	RS	1
4	Endocrines	4
5	Uterus , Skin, and Immuno- Pharmacology	2
	Total	20

CBME PATTERN OF PRACTICALS EXAM AND MARKS DISTRIBUTION:

Summative and Formative (Prelim Exam) in Pharmacology for 2nd MBBS

EXERCISE:- 1 – CLINICAL PHARMACY **Marks 20**

A) Pharmacy preparation and viva Marks 10
B) Clinical Pharmacokinetics Marks 5
C) Dosage form Marks 5

EXERCISE: - II – CLINICAL PHARMACOLOGY **Marks 30**

A) Prescription writing – a) Single drug therapy Marks 4
- b) Complete drug therapy Marks 6
B) Criticism – a) Criticize, Correct and Re-write (CCR) Marks 5
b) Fixed Dose Combination (FDC) Marks 5
C) Spots Marks 10
ADR identification/ADR Reporting/ 5 Marks
P Drug list 5 Marks

EXERCISE: - III – EXPERIMENTAL PHARMACOLOGY **Marks 10**

A) Pharmacodynamics Marks 5

B) Screening Technique Marks 5

EXERCISE: - IV – COMMUNICATION PHARMACOLOGY **Marks 10**
One OSPE Stations of 10 Marks from following topics

- Prescription Communication
- Ethics-Legal drug storage
- Use of devise
- Drug adherence-compliance
- Drug dependence/OTC
- Interaction with Medical representative

OSPE

- **Time**: 5 minutes
- **No of stations:** 1 station
- **Level of assessment:** Psychomotor / cognitive / Soft skill
- **Marks:** 10 marks
- Individual check list will be used for assessment

VIVA – VOCE Marks 30

- Viva 1-15 Marks
- Viva 2-15 Marks

TOTAL PRACTICAL MARKS (PRACTICAL &VIVA) Marks 100

INTERNAL EXAMS

There will be 2 Internal Exams besides prelims

There will be only one theory paper for both Internal Exams.

1st Internal Exam: End of January (Theory 100Mks, Practicals 100Mks)

2nd Internal Exam: End of April (Theory 100 Mks, Practicals 100Mks)

Portion for Internal Exams:

1st Internal Exam:

1. **Topics: -** General Pharmacology, ANS, Including skeletal muscle relaxants, Autocoids, CVS, Drugs acting on kidney

2nd Internal Exam:

Topics: - Drugs affecting blood and blood formation, GIT, Chemotherapy, RS

Prelims:

Paper 1	General Pharmacology including drug – drug interactions; Autonomic Nervous System; Cardiovascular System including drugs affecting Coagulation and those acting on the Kidneys; Haematinics; Agents used in Gastro – Intestinal Disorders; Ocular Pharmacology; Drug use at extremes of age, in pregnancy & in organ dysfunction; Diagnostic & Chelating agents; Environmental & Occupational Pollutants; Vitamins AETCOM Module 2.2
Paper 2	Neuro Psychiatric Pharmacology including Antiinflammatory – Analgesics and Addiction & its management; Pharmacology in Surgery (Particularly peri – operative management); Chemotherapy including Cancer Chemotherapy; Endocrinology; Dermatology ; Miscellaneous topics I (Lipid – derived autacoids; Nitric Oxide; Allergy – Histamines & Antihistamines including anti – vertigo, Anti Asthmatics; Anti – tussive agents; Immunomodulators; Vaccines & sera; Drugs acting on the uterus) AETCOM Module 2.7

1St and 2nd Internal Exams: (Time 3hrs)

Theory Paper Pattern and Marks Distribution:

Paper	Section	Type and Number of Questions	Marks alloted	Total Marks
1 theory Paper only	Section A	MCQs (20)	20 X1mk each= 20Mks	20
	Section B	SAQs (5/6) (1 SAQ compulsory from AETCOM) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
	Section C	SAQs (5/6) LAQs (1/2) (Atleast 1 LAQ clinical Based)	5X 6 Mks each =30 Mks 1X 10 Mks each=10 Mks	40
			TOTAL	**100**

Practicals Pattern and Marks Distribution:

CBME PATTERN OF PRACTICALS EXAM AND MARKS DISTRIBUTION:

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Annexure 38

1st Internal Assessment Exam in Pharmacology for 2nd MBBS

EXERCISE:- 1 – CLINICAL PHARMACY	**Marks 20**
A) Pharmacy preparation and viva	Marks 10
B) Clinical Pharmacokinetics	Marks 5
C) Dosage form	Marks 5
EXERCISE: - II – CLINICAL PHARMACOLOGY	**Marks 40**
A) Prescription writing – a) Single drug therapy	Marks 4
- b) Complete drug therapy	Marks 6
B) Fixed Dose Combination (FDC)	Marks 10
C) Spots	Marks 20
(4 x 5 M = 20 Marks)	
EXERCISE: - III – EXPERIMENTAL PHARMACOLOGY	**Marks 10**
A) Pharmacodynamics	Marks 5
B) Screening Technique	Marks 5
VIVA – VOCE	Marks 30
Total	**100 Marks**

Formative (2nd Internal Assessment) in Pharmacology for 2nd MBBS

EXERCISE:- 1 – CLINICAL PHARMACY	**Marks 20**
A) Pharmacy preparation and viva	Marks 10
B) Clinical Pharmacokinetics	Marks 5
C) Dosage form	Marks 5
EXERCISE: - II – CLINICAL PHARMACOLOGY	**Marks 30**
A) Prescription writing – a) Single drug therapy	Marks 4
- b) Complete drug therapy	Marks 6
B) Criticism – a) Criticize, Correct and Re-write (CCR)	Marks 5
b) Fixed Dose Combination (FDC)	Marks 5
C) Spots	Marks 10
ADR identification/ADR Reporting/	5 Marks
P Drug list	5 Marks

EXERCISE: - III – EXPERIMENTAL PHARMACOLOGY **Marks 10**

A) Pharmacodynamics Marks 5

B) Screening Technique Marks 5

EXERCISE: - IV – COMMUNICATION PHARMACOLOGY **Marks 10**

One OSPE Stations of 10 Marks from following topics

- Prescription Communication
- Ethics-Legal drug storage
- Use of devise
- Drug adherence-compliance
- Drug dependence/OTC
- Interaction with Medical representative

OSPE

- **Time**: 5 minutes
- **No of stations:** 1 station
- **Level of assessment:** Psychomotor / cognitive / Soft skill
- **Marks:** 10 marks
- Individual check list will be used for assessment

VIVA – VOCE Marks 30

- Viva 1-15 Marks
- Viva 2-15 Marks

TOTAL PRACTICAL MARKS (PRACTICAL &VIVA) Marks 100

Internal assessment calculation

Sr. No.	Criteria	Theory	Practical
1.	*All internal assessment examinations including preliminary examination	80	60
2.	Day to Day assessment		
	➢ Day to Day assessment (PBL/ One line questions/ MCQ)	20	-
	➢ Day to Day assessment (Viva/ Seminars/ OSPE/ SDL)	-	20
3.	Logbook + Journals (Journal + AETCOM logbook)	-	20
Total		**100**	**100**

***Internal assessment examinations marks conversion to internal assessment marks - Theory** – Total 400 marks of Internal exams including Prelims will be converted to 80

Practical – Total 300 marks of Internal exams including Prelims will be converted to 60

Total Marks on Final Marksheet for the subject of Pharmacology will be

Theory	200 Mks
Practical	100 Mks
IA	200 Mks
TOTAL	**500 Mks**

Resolution No.3.1.2.3 of BOM-59/2019: The updated list of Text books and Reference books for 2nd MBBS (Microbiology, Pharmacology, Pathology, FMT) are approved. **[Annexure-8]**

(To be merged with syllabus i.e. Annexure-69 of BOM-57/2019 dt.26/04/2019)

Recommended books

Text Books

1- Pharmacology and Pharmacotherapeutics by R.S. Satoskar, Nirmala K. Rege, Rakhi K Tripathi, S.D. Bhandarkar- Elsevier Publication
2- Essentials of Medical Pharmacology by K. D. Tripathi. Jaypee Brothers Medical Publishers, New Delhi
3- Sharma & Sharma's Principal of Pharmacology by H.L. Sharma and K.K. Sharma. Paras Medical Publisher New delhi

Practicals-

- Manual of Practical Pharmacology for MBBS by - Dr. Mukta N Chowta, Dr. Ashok Shenoy, Dr. Ashwin Kamath, Avichal Publishing Company , New Delhi

Reference Book-

1- Basic and Clinical Pharmacology by- Bertram G Katzung. Mc Graw Hill Education (India) Private Ltd. Chennai. Latest addition
2- Rang and Dale's Pharmacology by- H.P. Rang, J.M. Ritter, R.J. Flower, G. Handerson. Elsevier Health Sciences London
3- Goodman & Gillman's Pharmacological basis of therapeutics by- Laurence L. Brunton, Randa Hilal Dandan, Bjorn C. Knollmann. Mc Graw Hill Education New Delhi.

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