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MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
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COMPETENCY BASED MEDICAL EDUCATION

(CBME)

(with effect from 2019-2020 Batches)

Curriculum for

First M.B.B.S

Human Biochemistry

Amended upto BOM 63/2021, Dated 17/02/2021

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. 3.2.1.3.i]; Dated 16/09/2020.
3. Amended upto BOM 63/2021 [Resolution No. 4.1.1.2.ii, Resolution No. 4.4.1.5, Resolution No. 4.4.1.6]; Dated 17/02/2021.

Annexure – C– III

Distribution of Teaching Hours for First MBBS Biochemistry as per CBME curriculum

Sr.No.	Name of Topic Theory		Hours
1	Distribution of Theory Lectures based on new MCI Competency based Syllabus UG (including Horizontal & Vertical Integration)		**80**
2	Distribution of Practical hours based on new MCI Competency based UG curriculum Practical Skills assessment	**34**	**150**
3	Distribution of Practical hours based on new MCI Competency based UG curriculum: Observation of Use of Equipments / Techniques in Biochemistry Practical	**36**	
4	Distribution of Practical hours based on new MCI Competency based UG curriculum: Name of Topic for Clinicobiochemical correlation- basis & rational of tests in various conditions	**16**	
5	PBL/ Tutorial/ Small Group discussion/revision practicals/ integrated teaching	**64**	
6	SDL		**20**
	Total		**250**

Final Distribution of Total Teaching Hours

Subject- Biochemistry	**Hours**
Lectures	80 hrs
Small Group Teaching/Tutorials/Integrated learning/Practical hours	150 hrs
Self directed learning hours	20 hrs
Total hours	**250 hrs**
Early Clinical Exposure	30 hrs

Theory Syllabus I MBBS Batch 2020-2021 (As per CBME)

Theory: 80 hours

Topics For Theory Lectureswith Teaching Hours &Competencies

Sr. No.	Topics	Competency No	Hours
1.	Molecular & functional organization of cell & subcellular components	BI 1.1	1
2.	Chemistry & Metabolism of Carbohydrates.	BI 3.1 to BI 3.10	9
3.	Chemistry & Metabolism of Proteins.	BI 5.1 to BI 5.5	9
4.	Chemistry & Metabolism of Lipids.	BI 4.1 to BI 4.7	9
5.	Chemistry & Metabolism of Nucleo proteins & cell cycle	BI 7.1	4
6.	Enzymes.	BI 2.1 to BI 2.7	5
7.	Biological oxidation.	BI 6.6	2
8.	Chemistry & Metabolism Hb.	BI 5.2, BI 6.11	4
9.	Integration of metabolism and starvation metabolism	BI 6.1	2
10.	Mechanism of hormones action.	BI 6.5 , BI 13.5	1
11.	Vitamins (Fat & Water soluble)	BI 6.5	5
12.	Nutrition	BI 8.1 to BI 8.5	3
13.	Molecular Biology	BI 7.1 to BI 7.7,BI 9.3	6
14.	Biochemistry of cancer.	BI 10.1 to BI 10.2	2
15.	Immunology	BI 10.3 to BI 10.5	3
16.	Oxidative stress & antioxidants	BI 7.6 to BI 7.7	2
17.	Kidney function tests, Thyroid function tests ,Liver function tests, Adrenal function tests	BI 6.13 to BI 6.15	4
18.	Mineral Metabolism.	BI 6.9 to BI 6.10	4
19.	Water and Electrolyte Balance.	BI 6.7	2
20.	Acid base balance	BI 6.7 to 6.8	2
21.	ECM	BI 9.1 to 9.2	1
22.	Detoxification mechanisms, Role of xenobiotics in disease	BI7.5	1
23.	*Biochemical Laboratory Biomarkers alterations in patients of Covid 19		1

Practical Syllabus with Teaching Hours & Competencies

1. **Total Number of Practical hours including LCDS , Small group discussion, including tutorials and integrated teaching, revision practicals : 150 hours.**

List of Practicals, LCDs,Small group discussions etc.

First MBBS Practical Topics Total hours :34

SR NO	Name of Topic for Practical Skills assessment	Competency No.	Teaching method
1	Perform urine analysis to estimate and determine normal Constituents	11.4	DOAP
2	Perform urine analysis to estimate and determine abnormal Constituents	11.4,11.20	DOAP
3	Demonstrate the estimation of blood glucose	11.21	DOAP
4	Demonstrate the estimation of blood urea	11.21	DOAP
5	Demonstrate the estimation of serum creatinine and creatinine clearance	11.7,11.21	DOAP
6	Demonstrate estimation of serum proteins, albumin and A:G ratio	11.8,11.21,11.22	DOAP
7	Demonstrate the estimation of serum total cholesterol and HDLcholesterol	11.9	PRACTICAL
8	Demonstrate the estimation of triglycerides	11.10	PRACTICAL
9	Demonstrate estimation of calcium .	11.11	PRACTICAL
10	Demonstrate estimation of phosphorus .	11.11	PRACTICAL
11	Demonstrate estimation of Uric acid .	11.17	PRACTICAL
12	Demonstrate the estimation of serum bilirubin	11.12	PRACTICAL
13	Demonstrate the estimation of SGOT and SGPT	2.2,11.13	PRACTICAL
14	Demonstrate the estimation of alkaline phosphatase	11.14	PRACTICAL
15	C.S.F. Analysis	**11.15**	PRACTICAL

List of Lecture cum Demonstrations

C	Lecture cum Demonstrations		
SR NO	**Name of Topic for Observation of Use of Equipments/ Techniques in Biochemistry Practical**	**Competency No.**	**Teaching method**
1	Introduction to Biochemistry Laboratory Blood collection and anticoagulants	11.19	LCD
2	Common Laboratory instruments	B.I 11.16,11.19	LCD
3	First aid in Laboratory and Lab hazards	B.I. 11.1	LCD
4	Colorimetry	B.I 11.6	LCD
5	Autoanalyser	B.I B.I. 11.16	LCD
6	Spectrophotometry	B.I B.I.11.18	
7	pH meter	B.I 11.16	LCD
8	Paper chromatography of amino acid ,TLC	B.I. 11.5,11.16	LCD
9	Protein electrophoresis , PAGE	B.I. 11.16	LCD
10	Electrolyte analysis by ISE and Flammephotometry	B.I. 11.16	LCD
11	ABG analyzer	B.I. 11.16	LCD
12	ELISA	B.I. 11.16	LCD
13	Immunodiffusion	B.I. 11.16	LCD
14	Quality control	B.I. 11.16	LCD
15	DNA isolation from blood/ tissue	B.I. 11.16	LCD
16	GTT	B.I. 3.10	LCD
17	Advantages and disadvantages of use of fats in food	B.I.11.24	LCD
18	Calculate energy contents of different food items , identify food items with high and low glycemic index	11.23	LCD

Total Hours :36 Hours

List of SGDs - Basis and rational of tests in various conditions

Sr no	Name of Topic for Clinicobiochemical correlation – basis and rational of tests in various conditions	Competency No.	Teaching method
1	Diabetes mellitus	B.I.11.17	Small Group Discussion
2	Dyslipidemia, Myocardial infarction	B.I.11.17	Small Group Discussion
3	Renal failure,- proteinuria,- nephrotic syndrome	B.I.11.17	Small Group Discussion
4	Jaundice,- liver diseases	B.I.11.17	Small Group Discussion
5	Oedema , pancreatitis	B.I.11.17	Small Group Discussion
6	Disorders of acid- base balance	B.I.11.17	Small Group Discussion
7	Thyroid disorders	B.I.11.17	Small Group Discussion
8	Gout	B.I.11.17	Small Group Discussion

TOTAL HOURS : 16

	Common questions on AETCOM modules - Biochemistry
1	Enumerate and briefly describe the roles of IMG (physician) as per MCI.
2	Describe the role of a physician in health care system
3	Physician role and responsibility to society and community that he serves.
4	Essentials elements of communication skill
5	Barriers of communication.
6	Methods of communication
7	Effective listening
8	Non verbal communication

Paper wise distribution of theory topics:
Structural formulae are not obligatory.

Paper- I (100 marks) 3 hours duration

1. Molecular and functional organization of a cell and its sub-cellular components.
2. Enzyme.
3. Chemistry and metabolism of proteins.
4. Chemistry and metabolism of purines and pyrimidines and related disorders, Cell cycle.
5. Molecular biology : Genetic code, Replication, Transcription, Translation, Regulation of gene expression, Recombinant DNA technology, PCR ,DNA repair, gene mutation, Protein sorting & targeting.
6. Chemistry and Metabolism of haemoglobin.
7. Biological oxidation.
8. Immunology, Concept of vaccine development
9. Vitamins
10. Nutrition
11. *Biochemical laboratory , Biomarkers alteration in patients of COVID-19

PAPER - II (100 marks) 3 hours duration

1. Chemistry and metabolism of carbohydrates.
2. Chemistry and metabolism of lipids.
3. Mineral metabolism: Water and electrolyte balance & imbalance.
4. Acid base balance and imbalance.
5. Integration of various aspects of metabolism and their regulatory pathways. Starvation metabolism.
6. Mechanism of hormone action.
7. Liver function tests, Kidney function tests, Thyroid function tests, Adrenal function tests.
8. Detoxification mechanisms, Role of xenobiotics in disease
9. Biochemical basis of cancer and carcinogenesis, Apoptosis
10. Oxidative stress & Antioxidants in health & diseases.
11. ECM

MGMIHS
1st year MBBS. CBME
Format for Internal assessment examinations

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

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

I MBBS (Anatomy, Physiology & Biochemistry)

Time – 3 hrs. Preliminary / University examination

(* Applicable from 2020-21 Batch onwards)

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

Each paper –

- **Section A** – MCQ – 20 X 1 mark = **20 Marks**
  - **10% MCQ i.e. 2 in each paper must be clinical based**

- **Section B** -

Q1. **Answer any 5 out of 6 (BAQ)** **(5X3 marks =15 marks)**

Q2. **Answer any 3 out of 4 (SAQ)** **(3X5 marks =15 marks)**

- 1 SAQ will be clinical application based
- **1 SAQ will be from AETCOM modules (in Paper I)**

Q3. **Answer any 1 out of 2(LAQ)** **(1X10 marks =10marks)**

- LAQ should be structured (With defined marks distribution)

- **Section C** –

Q1. **Answer any 5 out of 6 (BAQ)** **(5X3 marks =15marks)**

Q2. **Answer any 3 out of 4 (SAQ)** **(3X5 marks =15 marks)**

Q3. **Answer any 1 out of 2 (LAQ)** **(1X10 marks =10marks)**

- LAQ should be structured (With defined marks distribution)

PRACTICAL EXAM PATTERN

(Formative Assessment)

Pattern	**Marks**
Q1- Long Quantitative Experiment	15
Q2- Urine Analysis	15
Q3- Spoting	10
Q4- Viva	10
Total	**50**

(Summative Assessment)

***Pattern of Preliminary/University Examination Biochemistry Practical: Total100 marks**

Pattern	Marks
Q.A Long quantitative experiments	30
Q.B Urine Analysis	20
Spotting Q.C Quality Control Q.D .Interpretation of laboratory reports Q.E Interpretation of special techniques	25
Q.F communication Skill	05
Q.G Viva	20
Total	100

Internal assessment calculation

Sr. No.	**Criteria**	**Theory**	**Practical**
1.	*All internal assessment examinations including preliminary examination	25	10
	Day to Day assessment		

2.	➢ Day to Day assessment (PBL/ TBL/ Seminar/ MCQ test etc)	10	
	➢ Day to Day assessment (Viva/ Spotters/ OSPE / OSVE etc)		5
3.	Logbook	5	
	Journals		5
Total		**40**	**20**

*__Internal assessment examinations marks conversion to internal assessment marks__

__-Theory__ – Total 400 marks will be converted to 25

__Practical__ – Total 200 marks will be converted to 10

*Applicable for 2020-21 Batch onwards

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