



RIHS MEDICAL & DENTAL COLLEGE

INTEGRATED CURRICULUM



ENDOCRINE MODULE

20203

Session 2022-23

SECOND YEAR MBBS

STUDY GUIDE

PLANNED & DESIGNED BY:

PROF. SABIHA M HAQ

RIHS Medical & Dental College, 2023 yearly grid

Second year MBBS Batch 2022-23

Block IV 12 weeks		Block V 13 weeks including Eidul Fitr Holidays			Holidays & Eidul Adha	Block VI 12 weeks		Resit & University Assessments			
9 th Jan. to 19 th Feb	20 th Feb. to 26 th March	27 th March to 2 nd April	3 rd April to 14 th May Eidul Fitr 21-25 April	15 th May to 22 nd June	23 rd June to 27 th June	28 th June to 30 th July Eidul Adha 28 June-2 nd July	31 st July to 17 th September	18 th September to 15 th October	16 th October to 22 nd October	23 rd October to 19 th November	December 2023
GIT & Nutrition Module 20101	Renal Module 20102	Block I Revision & Assess- ment	Endocrine & Maxillo facial Module 20203	Repro- duction Module 20204	Block II Revision & Assessment	Summer break	Neuro- sciences Module 20305	Special senses Module 20306	Block III Revision & Assessment	Resits and Pre- Assessment leave	Written & Practical Assessments
06 weeks	05 weeks	01week	05+1 weeks	06 weeks	01 week	04 weeks	07 weeks	04 weeks	01 week	04 weeks	03 weeks

*Each Module consists of integrated teaching of normal structure and function of the human body and their clinical context. In order to help the students, acquire knowledge, skills and professional behavior, special focus is placed on involving multiple teaching and learning strategies and Assessment modalities.

**Islamic studies is taught as one LGIS per week throughout all Modules

***Communication skills, Medical Ethics, Professionalism & Behavioral Sciences are taught in the relevant modules as parallel subjects

****There is continuous Formative & Summative Assessment throughout the Modules by relevant disciplines, in addition to end Block Assessment

PROF. DR. SABIHA M HAQ
HOD ANATOMY
RIHS MEDICAL & DENTAL COLLEGE

PROF. DR. SHAKAIB ANWAR
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Module 20203: Endocrine module

Session 2022-23

**Placement in curriculum: Module code: 20203
(Year 2, block code- 02, module code 03)**

Prerequisite: First year & block IV modules

	Disciplines	Name of Faculty
1.	Principal & HOD Ophthalmology	Prof. Dr. Shakaib Anwar
2.	Anatomy	Prof. Dr. Sabiha M. Haq
3.	Physiology	Prof. Dr. Jan Alam
4.	Biochemistry	Prof. Dr. Rehan Khawaja
5.	Pathology	Prof. Dr. Bushra
6.	Pharmacology	Prof. Dr. Azam Zia
7.	Community Medicine	Prof. Dr. Mirza Inamul Haq
8.	Forensic Medicine	Dr. Sabika Husain
9.	Behavioral Sciences	Ms. Nargis Munir
10.	Medical & Allied	Prof. Dr. Nadia Shams
11.	Surgery & Allied	Prof. Dr. Shaukat
Module duration		04 Weeks
Module planner		Prof. Dr. Sabiha M Haq
Module co-planner		Prof. Dr. Mirza Inamul Haq

<p>Module Coordinator</p>	<p>Dr. Fareeha Shan</p>
<p>Integrated Curriculum</p>	<p>The Integrated Curriculum is becoming an increasingly popular concept internationally in the field of Medicine.</p> <p>The goal of integration is to break down barriers between the basic and clinical sciences, currently in practice as a result of traditional curricular models.</p> <p>Integration should promote retention of knowledge and acquisition of skills through repetitive and progressive development of concepts and their applications.</p> <p>There are three areas in need of improvement and clarification for successful integration:</p> <ol style="list-style-type: none"> 1. Ensuring synchronous presentation of teaching material 2. Avoiding the tendency to diminish the importance of the basic sciences, and 3. Using unified definitions <p>(MEDICAL TEACHER)</p> <p>The model adapted in this institution is an Integrated, modular, system based, spiral curriculum.</p> <p>Arrangement of spirals: Two years + one year + two years</p>
<p>Students as a curriculum Coordinator and class representative</p>	<p>Student involvement in an integrated curriculum is the key to the process of making him a self-directed, competent and ethical learner who can adjust and compete with the latest trends in medical education in today's and tomorrow's world. In order to achieve this:</p> <ol style="list-style-type: none"> 1. Students will help the Module coordinators in accomplishing all tasks assigned to him/her. 2. They will be a part of curriculum planning and implementing team. 3. They will inform/discuss the ongoing activities/problems in teaching and learning with module coordinators and curriculum chairperson.

<p>Module Rationale</p>	<p>The endocrine system is one of the two control systems of the body. It consists of many small organs responsible for the release of hormones. The endocrine system regulates metabolism, growth and development, tissue function and mood of a person. This system acts by means of hormones secreted into the blood to control process that require duration rather than speed e.g. metabolic activities and water and electrolyte balance. In this module, we will concentrate on the integrating functions of the endocrine system and focus our teaching on the interaction of hormones and their integration to produce homeostatic regulation.</p>
<p>Module Outcomes</p>	<p>At the end of the module the students should be able to:</p> <p>Knowledge: The students should know the hormones and the organs producing them. They should know the chemical nature, biosynthesis and the physiological functions on their target organs. The student should understand & apply the concepts & principles of the basic sciences in context of clinical signs & symptoms to commonly occurring diseases of the endocrine.</p> <p>Skills: student should be able to recognize the histological features of all the endocrine glands under microscope.</p> <p>He should be able to perform all the steps of blood glucose estimation in the lab.</p> <p>Attitudes: Student should be able to observe lab safety rules.</p>
<p>Teaching and Learning methodology</p>	<p>Large Group Interactive Sessions (LGIS): The goal of INTERACTIVE LECTURE is to engage the students' attention, through ways to interact with the content, the instructor, and their classmates. Accordingly, INTERACTIVE LECTURES include segments of knowledge transfer, combined with segments where students interact. One of the things that makes the lecture interactive is the ability of the instructor to select the content of the lecture segments based on the students' needs. This demands a prior search for the baseline knowledge of the students at the start of the lecture. If students have difficulty answering a question, or an activity fails to develop the concept in most student groups, it's time to find a new and better way to deal with the material. INTERACTIVE LECTURE clearly gives a better concept of the content and keeps students' attention captured throughout, as compared to yester years' didactic lectures.</p>

	<p>Small Group Discussion (SGD): ‘The purpose and technique of small group teaching is to keep it learner-centered, with all students joining in free discussion on a particular topic. A typical ‘small group’ is around eight to 12 learners facilitated by a teacher. The steps of SGD are Forming, Storming, Norming & Performing. The teacher acts only as a facilitator. Students are allowed to use their books or other search material during the discussion. SGD is a good method to clear the concepts and develop communication and conflict solving skills in the students.</p> <p>Departmental lab. Teaching: This is a teaching & learning methodology where students learn handling of laboratory equipment, machines, their practical uses and safety rules.</p> <p>Skill lab. Teaching: This is performance based teaching & learning methodology where students learn to physically examine the patients and get hands on training on various clinical skills.</p> <p>Dissection and demonstration: Teaching of gross Anatomy is aided by cadaver dissection and demonstration on plastic models.</p> <p>Assignments and Presentations: Both of these methodologies are meant to make the students self-directed learners and good communicators by seeking knowledge from multiple sources and presenting it in front of facilitators and peers.</p>
<p>Assessment methodology</p>	<p>Multiple Choice Questions (MCQs):</p> <p>Structured Answer & Short Essay Questions (SAQs, SEQ):</p> <p>Structured Viva:</p> <p>Objective Structured Practical/Clinical Examination (OSPE /OSCE)</p>

No.	Topics	Discipline	Learning objectives	Learning Strategy	Assessment methodology
1.	Skull overview	Anatomy	<ul style="list-style-type: none"> • Identify the bones forming the anterior view of skull on the given bone. • Mark the main anatomical land marks like orbit, nasal cavity and oral cavity and mark their boundaries. • Identify the bones forming posterior view of skull on the given bone. • Mark the main anatomical land marks like internal occipital protuberance, lambdoid suture, and superior nuchal lines on the given bone. • Identify the bones forming the lateral view of skull on the given bone. • Mark the boundaries of temporal and infratemporal fossa and pterygopalatine fossa on the given bone. <ul style="list-style-type: none"> ○ Mark the bones forming pterion and explain clinical importance of pterion with the help of diagram. 	4 SGDs	OSPE/VIVA
2.	Pituitary gland, gross Anatomy and development	Anatomy	<ul style="list-style-type: none"> • Describe the location, parts and important relations of pituitary gland • Describe the development of pituitary gland • Explain the anomalies resulting from persistence of Rathke's pouch • Describe the Hypothalamo hypophyseal tract • Explain how the Hypothalamo-hypophyseal portal circulation works. 	1LGIS	MCQ
3.			<ul style="list-style-type: none"> • Describe the histology of <ul style="list-style-type: none"> ○ Adenohypophysis 	1 LGIS	MCQs

			<ul style="list-style-type: none"> ○ Neurohypophysis ○ Pars Intermedia of pituitary gland		
4.	Histology of pituitary gland	Anatomy	<ul style="list-style-type: none"> ● Identify the pituitary tissue under the microscope ● Write two points of identification ● Draw a labelled diagram on the histology note book. 	Skill Lab.	OSPE/VIVA
5.	Chemical structure and synthesis of hormones	Biochemistry	<ul style="list-style-type: none"> ● Discuss what polypeptide hormones are ● Define what steroid hormones are ● Enumerate hormones which are tyrosine derivatives ● Discuss synthesis and storage of hormones 	1 LGIS	MCQs Viva
6.	Hormone secretion, transport and clearance from blood	Biochemistry	<ul style="list-style-type: none"> ● Describe onset of hormone secretion ● Discuss concentration of hormones ● Explain secretion of hormones ● Elaborate feedback control of hormone secretion ● Discuss transport of hormones in blood ● Explain how the hormones are cleared from the blood 	1 LGIS	MCQs Viva
7.	Mechanism of action of hormones	Biochemistry	<ul style="list-style-type: none"> ● Explain what hormone receptors are and how they are activated ● Discuss the process of intracellular signaling ● Elaborate how second messenger mechanisms work ● Describe hormones that act on genetic machinery of the cell ● Explain how the measurement of hormone concentration is done 	1 LGIS	MCQs Viva
8.	Mechanism action of hormones	Biochemistry	<ul style="list-style-type: none"> ● Describe the Mechanism of action of hormones based on: ● Cytosolic or nuclear receptor mechanism for group I hormone 	1 LGIS	MCQs

9.	Pituitary hormones	Physiology	<ul style="list-style-type: none"> • Define hormones • Explain how various types of chemical messenger systems work • Explain the different control mechanisms for secretion of pituitary hormones 	1 LGIS	MCQs
10.	Control of pituitary secretions	Physiology	<ul style="list-style-type: none"> • Explain the hypothalamic control of pituitary secretions with reference to hypothalamo-hypophysial portal system • Enumerate the hormones secreted by the anterior pituitary • Enlist hypothalamic releasing and inhibitory hormones • Enumerate Posterior Pituitary Hormones 	1 LGIS	MCQs
11.	Anterior pituitary hormones-I	Biochemistry	<ul style="list-style-type: none"> • Describe the Structure of growth hormones • Describe the Mechanism of action of growth hormones 	1 LGIS	MCQs Viva
12.	Hormone Secretion, transport and clearance from blood	Physiology	<ul style="list-style-type: none"> • Describe the secretion, transport and clearance of various hormones • Describe the various methods of hormone concentration in blood 	SGD	MCQs
13.	Anterior pituitary hormones-II	Biochemistry	<ul style="list-style-type: none"> • Describe the Metabolic effects and clinical disorders of growth hormone on: <ul style="list-style-type: none"> ❖ Carbohydrates metabolism ❖ Protein metabolism ❖ Lipid metabolism ❖ Minerals metabolism • Discuss the growth promoting effects of growth hormone • Comment on the prolactin like effect of growth hormone 	1 LGIS	MCQs
14.	Pharyngeal apparatus	Anatomy	<ul style="list-style-type: none"> • Describe the development of pharyngeal apparatus 	1LGIS	MCQs
15.	Pharyngeal apparatus	Anatomy	<ul style="list-style-type: none"> • Define the structures developing from the three basic 	1LGIS	MCQs

			<p>embryological layers in each of the pharyngeal arches</p> <ul style="list-style-type: none"> • Make a table showing epidermal, mesodermal and endodermal derivatives from each pharyngeal arch 		
16.	Anterior pituitary hormone-III Thyroid-stimulating hormone	Biochemistry	<p>Describe the</p> <ul style="list-style-type: none"> • Biosynthesis • Mechanism of action • Metabolic functions • Biomedical importance • Clinical disorders <p>of TSH</p>	1 LGIS	MCQs Viva
17.	Growth Hormone	Physiology	<ul style="list-style-type: none"> • Describe the following physiological functions of Growth Hormone: • Metabolic effects • Effect on bone and cartilage • Effect through somatomedins 	1 LGIS	MCQs
18.	Growth Hormone	Biochemistry	<ul style="list-style-type: none"> • Describe physiological functions of growth hormone • Explain metabolic effects of growth hormone • Discuss somatomedins • Discuss regulation of growth hormone secretion • Describe abnormalities of growth hormone secretion 	1 LGIS	MCQs
19.	Anterior pituitary hormone-IV Adrenocorticotrophic hormones Follicle-stimulating hormone Luteinizing hormones	Biochemistry	<p>Describe the</p> <ul style="list-style-type: none"> • Biosynthesis • Mechanism of action • Metabolic functions • Biomedical importance • Clinical disorders <p>of ACTH, FSH, LH</p>	1 LGIS	MCQs Viva

20.	Posterior pituitary hormone -V Antidiuretic hormones Oxytocin	Biochemistry	Describe the <ul style="list-style-type: none"> • Biosynthesis • Mechanism of action • Metabolic functions • Biomedical importance • Clinical disorders of ADH and Oxytocin 	1 LGIS	MCQs Viva
21.	Gross Anatomy of thyroid and parathyroid gland	Anatomy	<ul style="list-style-type: none"> • Demonstrate the gross features of thyroid and parathyroid glands on models • Describe blood supply and nerve supply of thyroid and parathyroid glands through models • Describe the relations of vessels and nerves supplying the thyroid gland and their significance while performing thyroid surgery 	SGD	MCQs
22.	Histology of thyroid and parathyroid	Anatomy	<ul style="list-style-type: none"> • Describe histological features of thyroid and parathyroid gland • Describe the role of thyroid follicular cells in thyroid disorders • Identify the microscopic features of thyroid and parathyroid glands 	1 LGIS	MCQs
23.	Thyroid hormones	Biochemistry	<ul style="list-style-type: none"> • Explain the process of synthesis and secretion of thyroid hormones • Describe transport of thyroid hormones to tissues • Discuss physiological functions of thyroid hormones • Discuss regulation of thyroid hormone secretion • Discuss abnormalities of thyroid hormone secretion 	1 LGIS	MCQs Viva

24.	Parathyroid hormone Calcitonin	Biochemistry	<ul style="list-style-type: none"> • Describe the Chemistry, biosynthesis and mechanism of action of: <ul style="list-style-type: none"> ❖ Parathyroid hormone ❖ Calcitonin ❖ Metabolic role of parathyroid hormone and calcitonin in regulation of calcium level in blood • Describe the effect of both hormones on <ul style="list-style-type: none"> ❖ Kidneys ❖ Bones ❖ Intestine 	1 LGIS	MCQs Viva
25.	Histology of thyroid and parathyroid	Anatomy	<ul style="list-style-type: none"> • Identify the tissues under microscope and write two points of identification for each slide • Draw labelled diagram of the identified tissue on the histology note book 	Skill lab	OSPE/VIVA
26.	Development of Thyroid and Parathyroid gland	Anatomy	<ul style="list-style-type: none"> • Enumerate the arches from which thyroid and parathyroid glands develop. • Describe the mechanism of descent of thyroid and parathyroid glands during development • Describe the features of Congenital Hypothyroidism • Enumerate congenital anomalies of thyroid gland development • Explain how a thyroglossal cyst is formed • Explain how a branchial fistula is formed 	1 LGIS	MCQs
27.	Goitre	Community Medicine	<ul style="list-style-type: none"> • Discuss the importance of Iodine for humans • Discuss the statistics for Goitre in our country 	1 LGIS	MCQs

28.	Thyroid hormones	Physiology	<ul style="list-style-type: none"> • Explain the effects of thyroid hormone on: <ol style="list-style-type: none"> 1. Transcription of genes 2. Cellular metabolic activity 3. Growth 	1 SGD	MCQ
29.	PBL ON THYROID				
30.	Calcium & Phosphate regulation – I	Physiology	<ul style="list-style-type: none"> • Describe the absorption and secretion of calcium and Phosphate. • Describe the non-bone physiological effects of calcium and phosphate 	2 LGIS	MCQ
31.	Calcium & Phosphate regulation – II	Physiology	<ul style="list-style-type: none"> • Describe the precipitation and absorption of calcium and phosphate in bone • Describe the mechanism of bone calcification • Describe the mechanism of calcium exchange between bone and ECF 	1 LGIS	MCQ
32.	Vitamin – D	Physiology	<ul style="list-style-type: none"> • Describe the mechanism of activation of vitamin D3 to from 1,25 dihydroxy cholecaliferol • Describe the functions of vitamin-D 	1 SGD	MCQ
33.	Development and gross Anatomy of adrenal gland	Anatomy	<ul style="list-style-type: none"> • Describe gross features of adrenal glands • Describe the development of adrenal gland • Describe the process of differentiation of fetal cortex into adult cortex • Enlist congenital anomalies of adrenal gland 	1 LGIS	MCQ

34.	Histology of Adrenal gland	Anatomy	<ul style="list-style-type: none"> Describe the histological features of Adrenal gland Describe the cell types present in zones of adrenal gland and enumerate the hormones produced by each zone 	1 LGIS	MCQ
35.	Histology of Adrenal gland	Anatomy	<ul style="list-style-type: none"> Identify the histological features of Adrenal gland under microscope Write two points of identification for each slide. Draw labeled diagrams of the identified tissues on the histology notebooks 	Skill lab	OSPE/VIVA
36.	Mineralo-corticoids	Physiology	<ul style="list-style-type: none"> Enlist the hormones secreted by adrenal gland Describe the function of mineralocorticoids (Aldosterone) Describe the regulation of aldosterone secretion 	1 LGIS	MCQ
37.	Glucocorticoids I	Physiology	<ul style="list-style-type: none"> Enlist the effects of glucocorticoids Describe the effect of cortisol on carbohydrate metabolism of the body. 	1 LGIS	MCQ
38.	Glucocorticoids II	Physiology	<ul style="list-style-type: none"> Describe the effect of cortisol on: <ul style="list-style-type: none"> ❖ Protein metabolism ❖ Fat metabolism ❖ Explain the role of cortisol in resisting stress and inflammation 	1 LGIS	MCQ
39.	Hormones of Adrenal medulla	Physiology	<ul style="list-style-type: none"> Describe the functions of adrenaline and non- adrenaline and their regulation Describe the physiological variation in levels of adrenal medullary hormones 	2 LGIS	MCQ

40.	Adrenal cortex hormones-I Glucocorticoids	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of glucocorticoids <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Mechanism of action • Describe the effects of glucocorticoids on: <ul style="list-style-type: none"> ❖ Carbohydrates metabolism ❖ Lipid metabolism ❖ Protein metabolism ❖ Permissive action ❖ Anti-inflammatory action ❖ Immunosuppression ❖ Exocrine secretion ❖ Bones 	1 LGIS	MCQs Viva
41.	Adrenal cortex hormones-II Mineralo-corticoids	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of mineralo-corticoids <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Mechanism of action • Describe the effect of mineralo-corticoids on: <ul style="list-style-type: none"> ❖ Kidneys ❖ Fluid volume ❖ Sweat gland ❖ Salivary gland and gastric mucosa 	1 LGIS	MCQs Viva
42.	Adrenal cortex hormones-III <ul style="list-style-type: none"> • Androgenic corticoids • Androgens 	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of androgens <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Secretion ❖ Mechanism of action • Describe the effect of androgens on: <ul style="list-style-type: none"> ❖ Carbohydrates metabolism ❖ Lipid metabolism ❖ Protein metabolism ❖ Protein synthesis ❖ Minerals metabolism ❖ Skeletal growth ❖ Renal function • Discuss the disorders related to androgens 	1 LGIS	MCQs Viva

43.	Adrenal medullary hormones-I Catecholamines:	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of catecholamines: <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Storage ❖ Mechanism of action 	1 LGIS	MCQs Viva
44.	Adrenal medullary hormones-II Catecholamines:	Biochemistry	<ul style="list-style-type: none"> • Discuss metabolic effect of catecholamines on: <ul style="list-style-type: none"> ❖ Carbohydrates ❖ Lipids ❖ Insulin release ❖ Calorigenic function 	1 LGIS	MCQs Viva
45.	Endocrine pancreas-I Insulin	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of insulin: <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Secretion and its control ❖ Mechanism of action 	1 LGIS	MCQs Viva
46.	Control of Metabolic Regulation through insulin I	Physiology	<ul style="list-style-type: none"> • Enlist the endocrine hormones secreted by the pancreatic islet cells • Describe the physiologic function of insulin on CHO metabolism 	1 LGIS	MCQs
47.	Control of Metabolic Regulation through insulin II	Physiology	<ul style="list-style-type: none"> • Describe the effect of insulin on fat and protein metabolism • Describe the physiological role of glucagon hormone 	2 LGIS	MCQs
48.	Endocrine pancreas-III <ul style="list-style-type: none"> • Glucagon • Somatostatin 	Biochemistry	<ul style="list-style-type: none"> • Describe the following aspects of glucagon: <ul style="list-style-type: none"> ❖ Structure ❖ Synthesis ❖ Secretion and its control ❖ Mechanism of action • Discuss the effect of glucagon on: <ul style="list-style-type: none"> ❖ Carbohydrates metabolism ❖ Lipid metabolism ❖ Protein metabolism ❖ Minerals metabolism ❖ Heart ❖ Calorigenic action 	1 LGIS	MCQs Viva

			<ul style="list-style-type: none">• Discuss the chemistry and metabolic role of various somatostatins:<ul style="list-style-type: none">❖ Pancreatic❖ Hypothalamic❖ Gastrointestinal		
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Learning Resources:

Anatomy

Text Books

1. Regional Anatomy by Snell
2. Embryology by Langman's
3. Snell's Neuro Anatomy
4. Histology by Janquira
5. General Anatomy by Laique Hussain
6. General Anatomy by Laique Hussain

Reference Books:

7. Clinical Anatomy by Keith L. Moore
8. Histology by Laique Hussain
9. Histology by Difiore
10. Student Gray's
11. Embryology by Keith L. Moore

Physiology

12. Text Book of Medical Physiology by Guyton & Hall
13. Physiology by Lippincott

Biochemistry

14. Lippincott Biochemistry.
15. Harper's Biochemistry
16. Biochemistry by Chatterjee

Pathology

17. Pathologic Basis of Disease by Robbins and Cotran.

Pharmacology

18. Lippincott pharmacology.
19. Katzung Pharmacology. Biochemistry

Behavioral Sciences

20. Introduction to Psychology by Edward. E Smith.
21. Behavioral Science by Lippincott Williams.

Community Medicine

22. Text book of Preventive and Social Medicine by JE. Park

Medicine

23. Davidson's Text book of Medicine

Surgery

24. Text book of Surgery by Bailey & Love

25. Text book of Radiology by Christson

FOR ENQUIRIES CONTACT:

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STUDY GUIDE ENDOCRINE MODULE FOR 2ND YEAR MBBS, RAWAL INSTITUTE OF HEALTH SCIENCES
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