

2019 and 2024 Scheme

Q.P. Code: 116001

Reg. no.:

First Professional MBBS Degree Supplementary (SAY) Examinations November 2025 Biochemistry Paper - II

Time: 3 Hours

Total Marks: 100

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together • Leave sufficient space between answers
- Draw table/diagrams/flow charts wherever necessary

1. Multiple Choice Questions

(20x1=20)

The MCQ questions (Q.No. i to Q.No. xx) shall be answered **only in the OMR sheet provided at page No. 51** of the answer book (the inner portion of the back cover page (PART III)). Responses for MCQs marked in any other part/page of the answer book will not be valued. **For marking the correct responses use X mark only**

Questions i-v are single response type questions

- i. Which of the following hemoglobin has 2 alpha and 2 gamma globin chains
 a) Adult Hb A2 b) Fetal Hb c) Hb Gower 1 d) Hb Portland
- ii. Which of the following is **NOT** a congenital hyperbilirubinemia
 a) Breast Milk Jaundice c) Gilbert's Disease
 b) Crigler Najjar Syndrome d) Rotor Syndrome
- iii. All are causes of primary gout, **EXCEPT**
 a) Abnormal phosphoribosyl amidotransferase c) Abnormal PRPP Synthetase
 b) Deficiency of Glucose 6 Phosphate dehydrogenase d) Deficiency of HGPRTase
- iv. All the following contribute atoms to the purine ring **EXCEPT**:
 a) Glycine b) Respiratory CO2 c) Carbamoyl Phosphate d) Glutamine
- v. Choose the drug which is **NOT** an Anticancer drug
 a) 6 Mercaptopurine b) Methotrexate c) Acyclovir d) Cyclophosphamide

Question numbers vi-x are multiple response type questions. Read the statements and mark the answers appropriately.

- vi. True about genetic code
 1) Terminator codon-GUG 2) Non punctuated 3) Non -Overlapping 4) Initiator codon AUG
 a) 1, 2 & 3 are correct b) 1, 2 & 4 are correct c) 1, 3 & 4 are correct d) 2, 3 & 4 are correct
- vii. Tests for renal tubular function.
 1) Urine osmolality 3) Urine microalbumin
 2) Urine Concentration Test 4) Urine Specific gravity
 a) 1, 2 & 3 are correct b) 1, 2 & 4 are correct c) 1, 3 & 4 are correct d) 2, 3 & 4 are correct
- viii. Diseases associated with DNA repair mechanisms
 1) Fanconi anaemia 2) Carcinoid Syndrome 3) Xeroderma pigmentosum 4) Bloom's Syndrome
 a) 1, 2 & 3 are correct b) 1, 2 & 4 are correct c) 1, 3 & 4 are correct d) 2, 3 & 4 are correct
- ix. Statements that are **FALSE** about Transcription in eukaryotes are
 1) Transcription initiation site is Pribnow box.
 2) Post transcriptional processing includes Poly A tailing at 3'end.
 3) RNA Polymerase type II or B is responsible for production of tRNA
 4) mRNAs are capped at the 5' terminus by 7-methylguanosine triphosphate
 a) 1 & 3 b) 1 & 4 c) 3 & 4 d) 2 & 3
- x. Statements that are True about sickle cell disease are
 1) The glutamic acid is replaced by lysine in the 6th position of beta chain of HbA
 2) Pathophysiological changes include intravascular hemolysis and endothelial cell dysfunction
 3) HbS affords production against plasmodium falciparum
 4) Electrophoresis at alkaline pH shows a slower band than HbA
 a) 1, 2 & 3 are correct b) 1, 3 & 4 are correct c) 2, 3 & 4 are correct d) 1, 2 & 4 are correct

For Questions xi-xv there are two statements marked as - Assertion (A) and Reason (R). Mark your answer as per the options provided

- xi. **Assertion:** Salvage pathway is of special importance in Liver and Kidney
Reason: Salvage pathway uses more energy than de novo synthesis
 a) Both A & R are correct but R is not the reason for A c) A correct R incorrect
 b) Both A & R are incorrect d) Both A & R are correct R is reason for A
- xii. **Assertion:** Hyperuricemia is seen in malignant tumours
Reason: Enhanced turn over of nucleic acid
 a) Both A & R are correct but R is not the reason for A c) A correct R incorrect
 b) Both A & R are incorrect d) Both A & R are correct R is reason for A

(PTO)

- xiii. **Assertion:** Hysteria & Brain stem injury results in Respiratory Alkalosis where there is a primary deficit of carbonic acid
Reason: Hyperventilation will wash out CO₂
 a) Both A & R are correct but R is not the reason for A c) A correct R incorrect
 b) Both A & R are incorrect d) Both A & R are correct R is reason for A
- xiv. **Assertion:** An attack of Acute Intermittent Prophylia (AIP) is precipitated by starvation.
Reason: Porphyrins are excreted leading to photosensitivity in AIP
 a) Both A & R are correct c) A correct R incorrect
 b) Both A & R are incorrect d) A incorrect R correct
- xv. **Assertion:** In hypothyroidism, cholesterol level in blood is increased
Reason: Cholesterol carrying lipoprotein degradation is decreased
 a) Both A & R are correct but R is not the reason for A c) A correct R incorrect
 b) Both A & R are incorrect d) Both A & R are correct R is reason for A

Question numbers xvi-xx are case scenario-based questions

A 38 year old woman reported with a lump in her left breast. The lump was fixed, non-tender, hard, measuring 4cm in diameter with irregular margins. One lymph node 3 cm size was palpable in the apex of the left axilla. Mammography, blood tests for tumor markers and Fine Needle Aspiration Cytology (FNAC) findings confirmed a diagnosis of breast carcinoma.

- xvi. Tumor marker for breast carcinoma that is commonly used in clinical practice is
 a) HER2/neu b) CA 19.9 c) CA-125 d) Alpha Fetoprotein
- xvii. Pick the odd pair of tumor marker and associated cancer
 a) Carcinoembryonic Antigen (CEA), colorectal cancer
 b) Neuron specific enolase, choriocarcinoma
 c) Bence Jones Proteins, multiple myeloma
 d) Hydroxy indole acetic acid, malignant carcinoid syndrome
- xviii. All are oncogenic viruses **EXCEPT**
 a) Epstein Barr Virus b) Human Papilloma Virus c) Varicella Zoster d) Hepatitis B Virus
- xix. Choose the Antimutagen
 a) Flavonoids b) X ray c) UV Rays d) Benzopyrene
- xx. The disease due to an onco-suppressor mutation
 a) Cystic Fibrosis b) Huntingtons Chorea c) Retinoblastoma d) Sickle Cell Disease

Long essays

(2x10=20)

2. Describe Recombinant DNA Technology and its applications in Medicine.
3. A 53-year-old woman presents to the emergency department with persistent right upper abdominal pain and vomiting. She gives a history of having intermittent, less severe episodes of abdominal discomfort, especially on eating fatty and heavy meals over the previous year. Over last 6 days her urine had become darker in colour and stools pale. An abdominal ultrasound scan revealed gall stones. She was found to have yellowish discoloration of sclera. Lab investigations revealed Total Bilirubin – 9mg/dl, Direct Bilirubin – 6mg/dl, Alkaline Phosphatase – 510U/L, AST – 80U/L, ALT -76U/L
 a) What is the type of jaundice
 b) What are the other probable causes for this type of jaundice
 c) Describe the formation and excretion of bilirubin in the body
 d) What are the biochemical findings in the different types of jaundice

(1+1+4+4)

Short Essays:

(6x6=36)

4. A 72 year old beggar was brought to the hospital in a state of coma. He had the following biochemical findings. Blood Glucose – 560 mg/dL, Urine Sugar - > 2g% Plasma Bicarbonate – 15 mEq /L Rothera's test with Urine was positive, Blood pH – 7.3, pCO₂ 31 mm Hg.
 a) Diagnose the Acid Base disorder. What are the other causes for this Acid Base Disorder.
 b) Describe the role of the kidneys in regulation of acid base balance.
 c) Describe the Compensatory Mechanism for the above acid base disorder.
6. Name the different types of Immunoglobulins. Write their functions.
7. Describe the Watson and Crick model of DNA and substantiate the same with a diagram.
8. What is clearance. Describe the Clearance tests along with their significance.
9. What is meant by detoxification. Name the types of Phase one reactions. Explain Phase two reactions of detoxification, giving any Four examples.

(1+4+1)

(1+5)

(1+1+4)

10. Describe the Post translational modifications with suitable examples.

Short Answers

(6x4=24)

10. Define free radical and give any Two examples of free radicals. Name any two preventive and two chain breaking antioxidants.
11. Collagen.
12. Name Four variables leading to pre-analytical errors in clinical laboratory.
13. Role of ADH in water balance.
14. Oncogenes.
15. What is the role of a physician in the health care system.
