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First M.B.B.S. (2019) Examination, (Phase - I) Winter - 2023
BIOCHEMISTRY - I

Total Duration : Section A + B = 3 Hours

Section B Marks : 80

SECTION - B

- Instructions :**
- 1) Use **black** ball point pen only.
 - 2) **Do not** write anything on the **blank portion of the question paper**. If written anything, such type of act will be considered as an attempt to resort to unfair means.
 - 3) All questions are compulsory.
 - 4) The number to the **right** indicates **full** marks.
 - 5) Draw diagrams wherever necessary.
 - 6) Distribution of syllabus in Question Paper is only meant to cover the entire syllabus within the stipulated frame. The format is a mere guideline. Questions from the syllabus can be asked in any paper. Students can not claim that the Question is out of syllabus, as this format and distribution has been given only for the sake of placement.
 - 7) Use a common answer book for sections.

2. Brief Answer Questions (Solve any 10 Out of 11) :- **[10×2=20]**

- a) Enumerate any four types of vaccines with one example each.
- b) What is leptin? Mention its role in regulation of appetite.
- c) State how the glucokinase and phosphofructokinase reactions are bypassed in gluconeogenesis.
- d) With respect to oxidative phosphorylation explain why the P:O ratio for NADH and FADH₂ is 2.5 and 1.5 respectively.
- e) Define essential fatty acids and give two examples. State the composition of (i) gangliosides (ii) Slow Reacting Substance of Anaphylaxis (SRS-A).
- f) Name the defective protein and state the clinical features of Osteogenesis Imperfecta.
- g) Define the term isoenzymes. Explain the rise and fall pattern of Creatine Kinase-2 isoenzyme in myocardial infarction. **[½+1½]**
- h) Name the containers used for discarding the following biomedical waste.
 - (i) cotton swabs contaminated with blood
 - (ii) Human body parts
 - (iii) Used needles
 - (iv) Syringes without needles.
- i) Draw a neat labeled diagram of the cell membrane.

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- j) State the biomedical importance of (i) Hyaluronic acid (ii) Liver glycogen (iii) heparan sulphate (iv) Digitalis.
- k) Name the bile salts and state their role in lipid digestion.

3. Short Answer Questions (Solve any 8 Out of 9) :-

[8×5=40]

- a) Mention two conditions each causing positive and negative nitrogen balance. Explain the various indicators of protein quality. [2+3]
- b) Discuss the various barriers to effective doctor-patient communication.
- c) Enlist the parameters included in serum lipid profile test along with their normal range.
- d) Explain the lipid peroxidation chain reaction and the role of antioxidant vitamins in breaking it.
- e) Write a note on tumor markers.
- f) A 55 year old male visited the medicine OPD with complaint of increase in frequency of urination. Results of tests performed are as follows.
Random plasma glucose = 250 mg/dL, Glycated hemoglobin = 8.5%,
Urine sugar positive.
- (i) State the probable diagnosis. [$\frac{1}{2}$]
- (ii) Mention the criteria for the diagnosis of the disease. [$1\frac{1}{2}$]
- (iii) What is glycated hemoglobin. State its importance. [2]
- (iv) Explain the cause of presence of sugar in urine. [1]
- g) Enlist the various reactions of xenobiotic metabolism. Explain the phase I reactions.
- h) State the functions of phospholipids.
- i) Draw a neat labeled diagram of the mitochondrial electron transport chain also showing the inhibitors at various sites.

4. Long Answer Questions (Solve any 2 Out of 3) :-

[2×10=20]

- a) Describe the pathway of glycogenolysis. Explain how it is regulated. Write a note on Von Gierke disease (Type I glycogen storage disease). [5+3+2]
- b) Describe the pathway of beta oxidation of Palmitic acid. Explain the energetics of the pathway. Write a note on Refsum disease.
- c) Explain the different types of enzyme inhibition with examples.

