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01113B

First M.B.B.S. 2019 (New Course) Examination,
Summer (Phase - IV) 2020
BIOCHEMISTRY - II

Total Duration : Section A + B = 3 Hours

Section B Marks : 80

SECTION - B

- Instructions :**
- 1) Use **blue/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 entire syllabus within the stipulated frame. The Question paper pattern is a mere guideline. Questions can be asked from any paper's syllabus into any question paper. Students cannot claim that the Question is out of syllabus. As it is only for the placement sake, the distribution has been done.

2. Brief Answer Questions (Any Ten out of Eleven): [10 × 2 = 20]
- a) State any four clinical applications of enzyme linked immunosorbent assay (ELISA).
 - b) State normal concentration of serum potassium level. Why hypokalemia is induced during management of diabetic coma?
 - c) Name any two proteins with quaternary structure along with their subunits.
 - d) Define anion gap. Enumerate causes of high anion gap metabolic acidosis.
 - e) What is recommended dietary allowance of Niacin? Write manifestations of Niacin deficiency disorders.
 - f) Why methotrexate acts as a powerful anticancer agent? Name any two pyrimidine analogues that mimic structure of pyrimidines.
 - g) What is gene therapy? Name the vectors used for gene therapy.
 - h) Write principle of electrophoresis. State any two applications of electrophoresis technique.
 - i) Enlist any four features of genetic code.
 - j) Explain underlying mechanism of microcytic normochromic anemia in copper deficiency.
 - k) Mention biologically important compounds synthesized from glycine.

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[8×5=40]

3. Short Answer Questions (Any Eight out of Nine):

- a) Describe absorption, transport and storage of iron in body.
- b) Write principle of polymerase chain reaction. Enumerate its types and clinical applications.
- c) Define clearance. Enumerate renal clearance tests. Explain role of Cystatin C as glomerular filtration marker.
- d) Explain hormonal regulation of sodium and water balance. Mention clinical significance of Angiotensin Converting enzyme inhibitors.
- e) Write in brief about metabolic adaptations during various stages of starvation.
- f) Explain concept of lac operon along with its regulation.
- g) Describe sickle cell anemia under following heads:
 - i) Molecular basis of the disease.
 - ii) Clinical features.
 - iii) Laboratory investigations for the diagnosis of the disease.
- h) A 45 year old male rushed to emergency department for excruciating pain, swelling and redness of his right first metatarsophalangeal joint. His serum uric acid level was 13.5 mg%
 - i) What is probable diagnosis?
 - ii) What is biochemical defect in the disease?
 - iii) What are causes of hyperuricemia?
 - iv) Which drug is used in the management and why?
- i) A 33 year old lady presented with complaints of puffiness of face, slowness in physical activities, irregular menstrual cycles and overall weight gain since past 5 months. She underwent laboratory evaluation. Serum Free T₃ - 71 ng/dL (Normal 80-120 ng/dL), Serum Free T₄ - 0.3 ng/dL (0.8-2.4 ng/dL), Serum TSH 46 mu/ml (Normally less than 10 mu/ml) and Serum cholesterol was 360 mg/dL.
 - i) What is probable diagnosis of the patient?
 - ii) Give justification for increased level of serum cholesterol levels in the present case.
 - iii) What are other tests to assess functioning of thyroid gland?
 - iv) Name amino acid and mineral involved in synthesis of thyroid hormones.

4. Long Answer Questions (Any Two out of Three):

[2×10=20]

- a) Describe sources, metabolism, recommended dietary allowance, biochemical functions and deficiency manifestations of vitamin D.
- b) Describe the pathway of catabolism of phenylalanine and tyrosine along with associated inborn errors of metabolism. Enumerate compounds synthesized from tyrosine.
- c) What is normal pH of blood? Enumerate important buffer systems of the body. Describe respiratory and renal mechanisms that regulate acid base homeostasis.

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