22-11-2023

I-MBBS **01113A3+01113A4**

(This question paper consists of 2 pages)

First M.B.B.S. (New Scheme) (Main) Examination

November - 2023

Biochemistry

Paper- II

Time: Three Hours

Maximum Marks: 100

Attempt all questions in both sections.

(Use separate answer book for each section)

Section-A

1. Fill in the blanks: **6x1=06**

a) The enzyme _____ is a ribozyme which catalyzes peptide bond formation.

b) The mutated genes capable of causing cancer are called _____.

c) _____ is an antibody-based laboratory technique used to detect a specific protein in a blood or tissue sample.

d) Hereditary nonpolyposis colorectal cancer occurs due to defective _____ repair.

e) The enzyme _____ catalyzes the glucuronidation of bilirubin.

f) Bacterial artificial chromosomes can carry genomic DNA insert up to_____ kb in size.

2. Choose the correct option in the following multiple choice questions:4x1=4

i) Sickle-cell anemia is an example of:

a) Silent mutation

b) Missense mutation

c) Nonsense mutation

d) None of the above

ii) Which of the following antibody is found in tears?

a) IgG

b) IgA

c) IgM

d) IgE

iii) Which of the following is assessed by the Creatinine clearance test?

a) Renal concentration capacity

b) Renal dilution capacity

c) Glomerular function

d) Tubular function

iv) The essential amino acid limiting in rice is:

a) Methionine

b) Tryptophan

c) Lysine

d) Histidine

3. Clinical case study: **5x3=15**

A 26-year-old female is two months post-partum with her first pregnancy. The infant was carried to term without complications. She complained of extreme fatigue, weight gain, constipation, cold intolerance, and feelings of inadequacy as a mother. The clinician noted that the deep tendon reflex time was delayed. A blood sample was collected. Laboratory results were as follows:

- Glucose: 92.0 mg/dL
- Cholesterol: 192.0 mg/dL
- Triglycerides: 190.0 mg/dL
- TSH: 10.0 µIU/mL
- FT3: 1.8 pg/mL
- FT4: 0.54 ng/dL
- TPOAb: 5.5 IU/mL (ref range < 9.0 IU/mL)
- TgAb: 2.5 IU/mL (ref range < 4.0 IU/mL)

a) What is the most probable diagnosis?

b) What is the rationale behind the above diagnosis?

d) Which additional signs and symptoms should be taken into consideration?

e) What are the most likely causes of this disease?

f) Write down the normal biological reference range of Free T3, Free T4, and TSH in the serum of healthy adults?

4. Write short notes on (Any five): 5x2=10

a) DNA polymerases in eukaryotes and their functions

b) Antioxidant enzymes

c) Restriction endonucleases

d) Difference between glycemic index and glycemic load

e) Applications of Southern blotting technique

f) Okazaki segments

5. Explain briefly (Any three): 3x5=15

a) Gene library

b) Immune response

c) Mutation

d) Lac Operon

Section-B

6. Explain the process of transcription in detail. Describe the post-transcriptional modifications.

Write a note on the inhibitors of transcription.

7. Explain why (Any five): 5x2=10

a) Puromycin inhibits protein synthesis.

b) A combination of pulses and cereals becomes equivalent to first-class protein.

c) Serum Malondialdehyde acts as a marker of oxidative stress.

d) p53 functions as a tumour suppressor gene.

e) Malignant cells develop drug resistance to long-term administration of methotrexate.

f) Urobilinogen is absent from urine in obstructive jaundice.

8. Explain briefly (Any four): 4x5=20

a) Balanced diet

b) Hybridoma technology

c) Tumor markers

d) ELISA

e) Restriction fragment length polymorphism