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001/23

# The West Bengal University of Health Sciences
## MBBS 1st Professional Examination (New Regulation), Nov - Dec 2023

**Full Marks : 100**
**Time : 3 hours**

**Subject: Biochemistry**
**Paper : II**

*Attempt **all** questions. The figures in the margin indicate full marks.*

1. a) A 5 year old boy presented with blistering photosensitive lesions diagnosed as xeroderma pigmentosa.
   i) What is the molecular basis of this disorder?
   ii) Write a note on different agents of DNA damage.
   iii) Enumerate any six types of DNA repair methods.
   iv) Name the prokaryotic DNA polymerases involved in DNA repair.
   v) Name the eukaryotic DNA polymerases with their roles. 2+3+3+3+4

   b) Outline with diagram the process of elongation phase of translation in prokaryotes. Add a note on inhibitors of translation with examples. Mention three types of post-translational processing. Classify mutation. Explain the consequence of point mutation with a suitable example. 4+3+3+2+3

2. a) Enumerate the dietary sources of iron. Outline the mechanism of absorption, transport and storage of iron in the body. Mention two common causes of iron deficiency anemia. Outline the clinical manifestations and principle of treatment of iron deficiency anemia. 2+3+2+2+1

   b) Define xenobiotic. Describe the different phases of xenobiotic metabolism with proper examples. 2+8

   c) Draw the structure of an immunoglobin molecule and mention following regions: i) Amino & carboxy terminal, ii) –S-S- linkages, iii) Fab & Fc segment, iv) Papain & pepsin cleaving sites, v) Variable & constant region, vi) Antigen binding site.
   Explain briefly: Constant regions determine class specific effector functions of an immunoglobin. 6+4

3. Write short notes on the following: 2x5
   a) P53 tumour suppressor gene.
   b) RNA editing.

4. Explain the following statements: 5x4
   a) Post translational modification of collagen confers strength and rigidity.
   b) Restriction endonuclease show different cleavage patterns.
   c) Philadelphia Chromosome in CML is an example of Chromosomal translocation.
   d) Apoptosis is very important for preventing cancer.
   e) Following vegan diet strictly may lead to vitamin B12 deficiency.

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10x1

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5. Choose the correct option for each of the following:

i) Parathormone is required for the conversion of:
a) Cholecalciferol into 1-OH-cholecalciferol
b) Cholecalciferol into 25-OH-cholecalciferol
c) 25-OH- cholecalciferol into calcitriol
d) Cholesterol into 7-dehydroxycholecalciferol.

ii) Co-factor for conversion of d-UMP to TMP is:
a) SAM
b) Folate
c) B12
d) Niacin

iii) Example of monomeric enzyme of E. coli with more than one active sites:
a) DNAP I
b) DNAP II
c) DNAP III
d) DNAP IV

iv) Rifampicin acts by inhibiting prokaryotic:
a) Translation
b) Cell wall synthesis
c) Replication
d) Transcription

v) Eukaryotic RNA polymerase III synthesizes:
a) mRNA.
b) snRNA.
c) 28 S rRNA.
d) 5 S rRNA

vi) All manifestations are seen in Lesch-Nyhan syndrome except:
a) Self-mutilation
b) Immunodeficiency
c) Hyperuricemia
d) X-linked inheritance

vii) Which mineral is required for the formation of supersecondary protein structure that allows binding to DNA:
a) Iron
b) Selenium
c) Molybdenum
d) Zinc

viii) Many antimicrobials inhibit translation, which of the following antimicrobial is correctly paired with its mechanism of action?
a) Erythromycin binds to 60s ribosomal subunit
b) Puromycin inactivates elongation factor 2
c) Streptomycin binds to the 30s ribosomal subunit
d) Tetracyclines inhibit peptidyl transferase

ix) Example of oncofetal antigen is:
a) AFP
b) hCG
c) Alpha 1 antitrypsin
d) p53

x) Inosinic acid is the biological precursor of:
a) Uracil & thymine
b) Orotic acid & uridylic acid
c) Adenylic acid & guanylic acid
d) Purines and thymine

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