End Semester Examination, 2021
Semester - III
Human Physiology
PAPER - PHY 301 (U23+U24)

Full Marks : 40 (20+20)

Time : 2 Hours

UNIT - 23 (Cellular and Molecular Physiology)

1. ***Answer any <u>two</u> questions from the following :***

   2x2=4

   a) What is the difference between euchromatin and heterochromatin ? 1+1

   b) Write the significance of post-transcriptional modifications of RNA. 2

   c) What are oncogenes ? 1+1

   d) What is C value Paradox ? 2

2. ***Answer any two questions from the following :-***

   4x2=8

   a) What are the possible ways of functioning of lac operon ? What is a cistron ? 3+1

   b) Explain the degeneraly of genetic code by wobble hypothesis. 4

   c) Briefly describe the nucleosome model of chromosome organization. 4

(Turn Over)

d) What are transposons ? State their role in gene silencing ?

3. *Answer any <u>one</u> from the following :-*   **8x1=8**

a.i) Briefly describe the excision repair of DNA.

ii) Describe the process of initiation of DNA replication with a well labelled diagram.   3+(3+2)

b) Discuss, with suitable diagrams, the process of attenuation of E. Coli trp operon. Highlight the role of Pribnow box in the clain initiation process of Prokaryotic trascription.   4+4

UNIT-24 (Human Genetics)

1. *Answer any <u>two</u> questions from the following :–*

   2x2=4

a) What is dosage compensation ?   2

b) State the genetic basis of histocompatibility.   2

c) What is genetic drift ? How does it affect a population ?   1+1

d) What is Karyogram ?   2

2. *Answer any <u>two</u> questions from the following :*

   4x2=8

a) Discuss the types of euploidy with example.   4

b) Briefly explain the fate of xenobiotic metabolites.4

c) Mrs. Sharma (40 yrs. old) and her husband have an amniocentesis for advanced maternal age. They

already have four healthy children. They receive results indicating a 47, XXY Karyotype. What is the phenotypic sex of the fetus ? Explain. How many Barr badies will be found in each somatic cell ? 2+2

d) How is Down's Syudrome different from Klinefelter's Synolrome ? What is reciprocal translation ?

3. *Answer any <u>one</u> questions from the following :*
   8x1=8

a)i) The frequency of two alldes in a gene pool is 0.19 (A) and 0.81 (a). Assume that the population is in Hardy-weinberg equilibricm. – Calculate the percentage of heterozygous individuals in the population.

– Calculate the percentage of heterozygous individuals in the population.

– Calculate the percentage of homozygous recessives in the population. 3+3

ii) Define hemizygous with example. 2

b) What is Hardy-Weinberg Principle ? State briefly the wright-Fisher model of genetic drift. 3+5