〔85〕   **Sardar Patel University**
S.Y. B.Sc. Third Semester Examination-2020-2021
Subject-Genetics; Course-US03CGEN21 - Principles of Genetics I

Time : 2.00pm-4.00pm   **Date:02/01/2021**   **Total Marks-70**

Q.1   **Choose the correct answer from the given alternatives**   **10M**

1   When one gene affects the expression of other gene which is not its allele is _____
    a) Epistasis   (b) Pleiotropy   (c) Lethal Gene action   (d) Dominance

2   Gene action in ABO blood group expression
    a) Co-dominant   b) multiple alleles   c) Dominant   d) All of above

3   Relative distance between two genes is indicated by
    a)% of parental combinations   b) % of recombinants
    c) Both A and B   d) None of above

4   Mendel's work was rediscovered in the year
    a)1822   b) 1866   c) 1900   d) None of above

5   Example of supervital gene is
    a) Yellow coat colour in mice   b) Salt resistance gene in plants
    c) Both a and B   d) None of above

6   Presence of only parental combinations in progeny shows_____linkage
    a)Complete   b) Incomplete   c) Both a and b   d) None of the above

7   Length of life cycle of drosophila is
    a)20 days   b) 3 days   c) 12 days   d) none of the above

8   How many mitotic divisions are required for a single cell to make 128 cells
    a)7   b) 28   c) 32   d)14

9   Quartile deviation =
    (a) $(Q3-Q1)/2$ b) $(Q3+Q1)/2$ c) $Q3-Q1$ (d) none of these

10   Standard deviation is the _____ of the Variance.
    (a) square root   (b) square   (c) coefficient   (d) none of these

Q.2   **Fill in the blanks& True/False.**   **8M**

1   Linkage groups in mice is _____

2   crossing over takes place in _____ stage of meiosis

3   cM is unit for _____

4   Skin colour in human is qualitative trait   True/False

5   Example of Pleiotropy is sickle cell anemia   True/False

6   Drosophila males show incomplete linkage for wing length and body colour
    True/False

7   The formula of Lower Quartile (Q_1) = ...

8   The most appeared observation in the group of data is the Median.   True / False

Q.3 Short answer questions (attempt any 10 out of 12).   **20M**

1   Define Pleiotropy and Co-dominance

2   Give any four important points for Mendel's experimental design

3   Enlist the symbols for pedigree construction

4   What are theories of evolution ?

5   Differentiate between Qualitative and Quantitative traits

6   Enlist factors affecting gene and genotype frequency

7   Write about *E. coli* as model genetic system

8   What are linkage groups. Give linkage groups in human

9   What are chromosomal map?

10   Write the significance of crossing over.

11   In a sample study about coffee habit in two towns, the following information was received: Town A : Females were 40%, Total coffee drinkers were 45% & Males non coffee drinkers were 20%.
Town B : Males were 55%, Males non coffee drinkers were 30% &Females coffee drinkers were 15%. Present the above data in tabular form.

12   Define Biostatistics.

Q.4 Long answer questions (attempt any FOUR out of 8)   **32M**

1   State and explain Hardy–Weinberg law.

2   What model genetic system? What they are important? Write a short note on Drosophila and mice.

3   Discuss cytological detection of crossing over- Sterns experiment

4   Write a detail note on linkage.

5   State and explain Mendels Law of independent assortment

6   Write a detail note epistasis.

7   Calculate Mean, Median and Mode for the following data.

Class	160-165	165-170	170-175	175-180	180-185	185-190
frequency	8	12	14	7	6	3

8   The median of distribution is 49 for following data, find the missing frequency & Upper Quartile (Q_3).

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of students	5	8	7	12	-	20	10	10

————————✂————————

[2]