

(48)

**SARDAR PATEL UNIVERSITY****B. Sc. (Genetics) – Third Semester Examination (CBCS)****Thursday, 22<sup>nd</sup> November 2018****2:00 p.m. to 5:00 p.m.****US03CGEN02: Principles of Genetics – I****Total Marks: 70**

Note: (1) Figures to the right indicate marks.

(2) Draw a neat and labeled diagram, wherever necessary.

**Q. 1 Choose the most appropriate answer from the four alternatives given: [10]**

- i. Mendel selected pea plants for his experiment because of.....
- (a) Several characters with two contrasting forms  
(b) Flower structure of pea ensures self- pollination  
(c) Duration of pea crops is of a single season  
(d) All of these
- ii. Phenotypic ratio in Monohybrid cross is.....
- (a) 1 : 2 : 1    (b) 3 : 1    (c) 2 : 1    (d) 9 : 3 : 3 : 3 : 1
- iii. When one gene affects the expression of other gene located at different locus, the phenomenon is called as.....
- (a) Co- dominant    (b) Pleiotrophy    (c) Lethal gene action    (d) Epistasis
- iv. The number of Barr bodies in a female is always.....
- (a) One less than X chromosomes    (b) Equal to X chromosomes  
(c) One more than X chromosomes    (d) Two less than X chromosomes
- v. Milk yield in cow is a.....trait.
- (a) Dominant    (b) Sex linked    (c) Sex limited    (d) Sex influenced
- vi. Dosage compensation in mammals are achieved by.....
- (a) Decreased transcription by half in both of the X chromosomes of a hermaphrodites  
(b) Two-fold increase in the transcription of a single male X chromosome  
(c) Random inactivation of one female X chromosome  
(d) All of these
- vii. A class width of the class 23.5 – 31.5 is.....
- (a) 7.5    (b) 9    (c) 7    (d) 8
- viii. Collection of data regarding number of mobiles in the bags of 46 students are categorized as.....
- (a) Qualitative    (b) Continuous    (c) Discrete    (d) None of these
- ix. The geometric mean for the observations 1, 3, 9, 3 is.....
- (a) 5    (b) 4    (c) 2    (d) 3

**(P.T.O.)**

①

x. Which one of the following measure is used to compare the variability among two sets of observations?

- (a) Absolute (b) Perfect (c) Relative (d) None of the above

Q.2 Answer any TEN from the following: [20]

- i. Enlist sub-disciplines of genetics.
- ii. Define the term co-dominance.
- iii. What are multiple alleles? Write its examples.
- iv. Explain gynandromorphs.
- v. Differentiate between Sex influenced and sex linked traits.
- vi. Give an overview of genetic imprinting.
- vii. Calculate the median of 7 observations 33, 34, 30, 28, 36, 33 and 23.
- viii. Define quantitative data.
- ix. Differentiate between biostatistics and statistics.
- x. What are absolute measures of dispersion? Give examples.
- xi. Write differences between geometric and harmonic mean.
- xii. What is quartile deviation?

Q.3 (a) State and explain Mendel's law of independent assortment. [6]

(b) Write different symbols used in representing human pedigree. [4]

OR

Q.3 (a) Briefly explain supplementary genes and inhibitory genes. [6]

(b) Write a note on pleiotropy. [4]

Q.4 What are the mechanisms of sex determination in animals? Explain environmental and hormonal sex determination animals. [10]

OR

Q.4 Discuss sex determination in Drosophila. [10]

Q.5 (a) How do you represent biological data graphically? Explain the  $\pi$  (pie) – chart. [5]

(b) Write a note on methods for the collection of biostatistical data. [5]

OR

P.T.O.

2

Q.5 (a) How do you represent biological data diagrammatically? Explain frequency polygon in detail. [5]

(b) Plot appropriate graph for the following expenses (Rs. / month) by two families A and B. [5]

Family	Food	Clothing	House Rent	Electricity	Phone	Others
A	12000	4000	18000	8000	2000	8500
B	16000	7000	23000	8000	4000	11000

Q.6 (a) Write definition and formula (if applicable) for the following: [04]

(i) Range (ii) Coefficient of standard deviation

(b) Calculate the range, mean deviation, standard deviation and its coefficient for the following data: [06]

Class	0 - 100	100- 200	200- 300	300 - 400	400 - 500	500 - 600
Frequency	12	18	27	20	94	100

**OR**

Q.6 (a) Write definition and formula (if applicable) for the following: [04]

(i) Mean deviation (ii) Variance

(b) Calculate the range, mean deviation, standard deviation and its coefficient for the following data: [06]

Marks	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of students	15	27	39	30	22	9

~~XXXXXXXXXX~~

③

