

(114)

**SARDAR PATEL UNIVERSITY**  
**M. Sc. (Genetics) – Second Semester Examination (CBCS)**  
**Monday, 9<sup>th</sup> April, 2018**  
**2:00 p.m. to 5:00 p.m.**  
**PS02CGEN21: Cytogenetics**

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: [08]**

- i. Reverse banding obtained by using.....  
 (a) Daunamycine (b) Adremycine (c) Chromomycine A3 (d) All of these
- ii. In humans, some of the somatic cells enter a non-cycling stage known as.....  
 (a) G<sub>0</sub> stage (b) G<sub>1</sub> stage (c) G<sub>2</sub> stage (d) M - Phase
- iii. Fragile site experimentally induced in the laboratory by culturing cells in a medium with .....  
 (a) Low folate content (b) Folate antagonists (c) Excess of thymidine (d) All of these
- iv. Isochromosome is a result of.....  
 (a) Longitudinal division of centromere (b) Transverse division of chromatids  
 (c) Transverse division of centromere (d) Longitudinal division of chromatids
- v. Philadelphia chromosome is a result of translocation between.....  
 (a) Chromosomes 19 and 22 (b) Chromosomes 9 and 22  
 (c) Chromosomes 19 and 2 (d) Chromosomes 19 and 12
- vi. Which biopsy is unsuitable during cytogenetic analysis of oocyte or embryo?  
 (a) Blastocyst (b) Cleavage stage (c) Skin (d) Polar body
- vii. Crossing of cytogenetically abnormal carrier animals produces disease/s in .....% of animals in next generation.  
 (a) 25 (b) 50 (c) 75 (d) 100
- viii. Jumbo and seedless varieties of water melons are common example of.....  
 (a) Autotriploidy (b) Allopolyploidy (c) Autotetraploidy (d) Allotriploidy

**Q-2 Answer any SEVEN from the following: [14]**

1. Write full names of ISCN, WCP, CCD and PWM in terms of cytogenetics.
2. Differentiate between euchromatin and heterochromatin.
3. Enlist various miscellaneous banding techniques.

P.T.O.

4. Differentiate between paracentric and pericentric inversions.
5. Define the terms: Ring chromosomes, marker chromosomes
6. Write full names of CML, AML, ALL and FAB in terms of cancer cytogenetics.
7. Write haploid chromosome numbers in cattle, buffalo, dog and pig.
8. When and how the amniotic fluid is collected for chromosomal analysis?
9. Differentiate between allopolyploidy and autopolyploidy.

Q-3 A. Write short notes on the following:

- (1) Cell cycle (2) Giemsa staining

[3+3]

B. Enlist and explain various types of C banding techniques.

[06]

OR

B. Describe global structure of chromosomes.

[06]

Q-4 A. (1) Classify human chromosomes in to groups.

[03]

(2) Write major difference between terminal, interstitial and microdeletion.

[03]

B. List out various trisomic conditions involving autosomes and sex chromosomes in human. Explain Klinefelter's syndrome.

[06]

OR

B. List out various structural abnormalities in human chromosomes. Give detailed account on chromosomal translocation.

[06]

Q-5 A. Enlist and explain various types of supplements for lymphocyte growth media.

[06]

B. Why there is a need for cytogenetic characterization of various cell lines?

[06]

OR

B. Describe collection and long term culturing technique for chorionic villi.

[06]

Q-6 A. Describe Micronucleus assay and Alkaline Comet assay for genotoxicity testing.

[06]

B. Give an account on applications of cytogenetic investigations to clinical practice.

[06]

OR

B. How artificial induction of polyploidy in plants carried out? Explain the genesis and importance of *Gossypium hirsutum*.

[06]

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