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SARDAR PATEL UNIVERSITY

M. Sc. (Genetics) – Second Semester Examination (CBCS)

Tuesday, 5th April, 2016

10:30 a.m. to 1:30 p.m.

PS02CGEN02: 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. **Special chromosomes include……**

(a) Lamp brush chromosome (b) Polytene chromosome

(c) Both (a) and (b) (d) None of these

ii. **Replication of ring chromosomes may produce……**

(a) Double sized ring with 2 centromere (b) Two separate copy of ring

(c) Double sized ring with 1 centromere (d) None of these

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. **Hypotonic treatments to the amniocytes are given using ……**

(a) 0.56% KCl (b) 0.075 M KCl (c) 0.8% Sodium citrate (d) 0.56 % Sodium citrate

v. **Haploid number of chromosomes in poultry / Chicken is……**

(a) 38 (b) 39 (c) 30 (d) 42

vi. **Chromosome preparation from human oocytes requires……**

(a) Hyaluronidase (b) Podophyllotoxin (c) FIX I, II & III (d) All of these

vii. **……has greatly contributed to the evolution of the plants.**

(a) Allopolyploidy (b) Autopolyploidy (c) Autotriplody (d) Xenopolyploidy

viii. **Match the following and choose correct answer from the codes given below:**

A. Telomere Banding	1. Alteration in fixative during harvesting process
B. G – 11 banding	2. Ammoniacal silver staining
C. RE banding	3. Staining of chromosomes with Giemsa at pH 11
D. Cd banding	4. Treatment of chromosomal slide with *Hae* III
	5. Incubation of chromosomes for 20 – 60 minutes at 87°C in EBSS/ PBS (pH 5.1)

	A	B	C	D
(a)	3	2	4	1
(b)	2	4	1	5
(c)	5	3	4	1
(d)	1	4	3	2

P.T.O.

Q-2 Write major differences for the following (Any SEVEN): **[14]**

1. Heterochromatin and euchromatin.
2. Trypsin G-banding and hot buffer trypsin G-banding.
3. Edward syndrome and Jacob syndrome.
4. Microdeletions and terminal deletions.
5. Pericentric and paracentric inversion.
6. CML and AML.
7. Mechanical and biological dissociation of solid tissues.
8. Old World cotton and New World cotton.
9. Autopolyploidy and allopolyploidy.

Q-3 **A.** Enlist and explain various types of Reverse banding techniques. **[06]**

B. Define the terms Non - disjunction and cell cycle. Write various signs and abbreviations used to describe human karyotype as per ISCN system. **[06]**

OR

B. Write short notes on the following:

(a) Sister chromatid exchange **[03]**

(b) Applications of FISH in chromosomal analysis **[03]**

Q-4 **A.** Enlist various structural abnormalities in human chromosomes. Give a detailed account on chromosomal translocations. **[06]**

B. Write selection of the samples for chromosomal analysis from different referral groups. **[06]**

OR

B. Write short notes on the following:

(a) Klinefelter's syndrome **[03]**

(b) Down's syndrome **[03]**

Q-5 **A.** Discuss requirements of cell culture for prenatal cytogenetic diagnosis. **[06]**

B. Describe collection and short term culturing techniques for chorionic villi cells. **[06]**

P.T.O.

OR

B. Write short notes on the following:

(a) WHO subtypes of AML. **[03]**

(b) Cytogenetic characterization of various cell lines **[03]**

Q-6 A. Describe various genotoxicity evaluation assays/tests. **[06]**

B. What is ploidy? Explain genesis and importance of *Triticosecale wittmack.* **[06]**

OR

B. Write short notes on the following:

(a) Importance of cytogenetic investigations in dairy animals. **[03]**

(b) Chromosomal anomalies suspected during infertility or reproductive failure in human. **[03]**

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