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(173) SEAT No._____ No. of Printed Pages: 02

SARDAR PATEL UNIVERSITY
M. Sc. GENETICS – Third Semester Examination
Thursday, 9th November, 2017.
2:00 p.m. to 5:00 p.m.
PS03EGEN01: Genetics of Mammalian Development

Note :(i) Figures to right indicate marks.
(ii) All questions are compulsory.

Total Marks: 70

Q – 1 Choose the most appropriate alternative for the following: **(08)**

1. In oogenesis how many polar bodies are formed at the end of meiotic division?
   a) One b) Two
   c) Three d) Four
2. In mammalian development, the embryo will form from which population of cells?
   a) the blastocoels b) the inner cell mass
   c) the trophectoderm d) the extraembryonic membranes
3. Retinoblastoma is associated with an abnormality of chromosome_____.
   a) 14 b) 12
   c) 13 d) 16
4. Sertoli cells secrete _____ hormone.
   a) Estrogen b) Testosterone
   c) Anti-Mullerian Duct hormone d) Ant-wolfian duct hormone
5. Single cell with multiple nucei is called _____.
   a) polymorphonucleus b) syncitium
   c) cleavage furrow d) karyogamy
6. Peak level of Bicoid regulatory protein require for _____ structure formation in Drosophila.
   a) Head b) Thorax
   c) Wing d) Segmented
7. Which one of the following is not a zygotic gene?
   a) Gap gene b) Pair rule gene
   c) Segment polarity gene d) Selector gene
8. _____human conceptions do not successfully develop to full term.
   a) 1/2 b) 1/3
   c) 1/4 d) 1/2 - 2/3

Q – 2 **Attempt ANY SEVEN from the following:** (14)

1. Draw and label the parts of a sperm cell, and list the functions of each.
2. Write the basic steps of oogenesis.
3. Classify the stem cells based on potency with example.
4. Write about progeria.
5. What is endocrine disruptor? give examples.
6. Differentiate between cis and trans acting regulatory elements.
7. Enlist major classes of developmental anomalies.
8. Write names of any 2 transcription factors genes and their mutation phenotypes.
9. Differentiate between primary and secondary infertility.

Q – 3 (a) Discuss the types of cleavage patterns and the role played the yolk on cleavage. (06)

(b) Describe the process of fertilization and add a note on prevention of polyspermy. (06)

OR

(b) Write short note on followings:

1) Development of human brain (03)
2) Cell movements during Gastrulation (03)

Q – 4 (a) Explain the mechanisms for conversion of proto-oncogenes into oncogenes. (06)

(b) How tumor suppressor genes lead to cancer? Explain with a suitable example. (06)

OR

(b) Explain alcohol and retinoic acid as teratogens. (06)

Q – 5 (a) Describe cell to cell contact strategy for gene expression during development. (06)

(b) Enlist techniques determining the functions of genes during development and Explain gene knock-out and anti-sense RNA techniques for the same. (06)

OR

(b) Explain muscle differentiation in Sea squirt embryo by localized m-RNA. (06)

Q – 6 (a) Discuss various syndromes associated with human sex chromosomal aberrations. (06)

(b) Give a detailed account on infertility. (06)

OR

(b) 1. Explain positional cloning technique for identification of genes associated with human developmental anomalies. (03)

2. Write a note on phenotypic heterogeneity. (03)

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