

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2025
(Sixth Semester)

Branch- BIOTECHNOLOGY

ANIMAL BIOTECHNOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 × 1 = 5)

- 1 ----- is the primary role of the *bicoid* gene in *Drosophila* oocyte development
a) Formation of posterior structures b) Patterning of the thoracic segments
c) Determination of dorsal-ventral axis d) Establishment of anterior-posterior axis
- 2 What is the typical concentration of CO₂ used in an incubator for animal cell culture?
a) 2-3% b) 5-10% c) 15-20% d) 20-25%
- 3 Which of the following methods is not a direct cell counting method?
a) Hemocytometer b) Automated cell counter
c) Colony forming unit assay d) Trypan blue exclusion
- 4 In HAT selection, a ----- enzyme is blocked by aminopterin.
a) Dihydrofolate reductase b) Hypoxanthine guanine phosphoribosyl transferase
c) Thymidylate synthase d) Glutamine synthetase
- 5 ----- is the main purpose of somatic cell genetics in biological research.
a) To understand the role of specific genes in somatic cells
b) To study the inheritance of traits across generations
c) To isolate stem cells for therapeutic use
d) To observe genetic variations in gametes

SECTION - B (15 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 3 = 15)

- 6 a Describe the process of embryo collection in assisted reproductive technologies.
OR
b Explain the role of maternal proteins in the early stages of embryonic development.
- 7 a Describe the importance of amino acids in culture media for primary cell culture.
OR
b How is pluripotency important in stem cell research?
- 8 a List out the role of feeder layers in cell culture.
OR
b Summarize the process of organ culture.
- 9 a Explain any one antibiotic resistance gene which functions as a selectable marker.
OR
b Discuss the applications of gene knockout technology.
- 10 a Highlight the benefits of pharming in the production of biopharmaceuticals.
OR
b How is biosafety important in biological research?

Cont...

SECTION -C (30 Marks)

Answer ~~ANY THREE~~ questions

ALL questions carry ⁽²¹⁾ EQUAL Marks (5 × 6 = 30)

- 11 a Explain the steps involved in *in-vitro* fertilization and discuss the significance of Intracytoplasmic Sperm Injection in overcoming male infertility in IVF.
OR
b Describe the process and significance of spermatogenesis in human reproduction.
- 12 a Discuss how nutrients and hormones in culture media ensures optimal cell function and growth under *in vitro* conditions.
OR
b List out the basic requirements for ATC laboratory.
- 13 a Explain the procedures for cryopreservation of cells in cell banking.
OR
b Describe the steps involved in performing the MTT assay.
- 14 a Describe how gene therapy works to treat genetic disorders.
OR
b Explain any two animal viral vectors for transfection.
- 15 a Discuss the methods used to create transgenic animals.
OR
b Elucidate cell culture based vaccines.

Z-Z-Z END