

[This question paper contains 4 printed pages.]

Your Roll No.

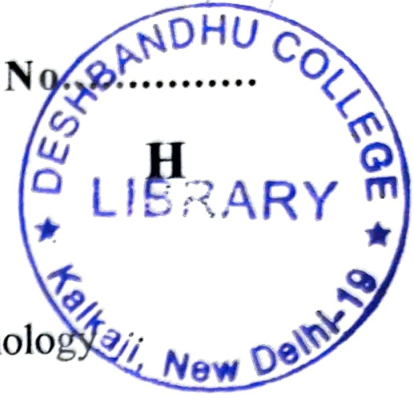
Sr. No. of Question Paper : 3095

Unique Paper Code : 32237903

Name of the Paper : Animal Biotechnology

Name of the Course : B.Sc. (H) Zoology

Semester : VI (DSE)



Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer **five** questions in all.
3. Q. No. 1 is compulsory.

1. (a) Define the following : (5)

- (i) Genetically modified organism
- (ii) Humulin
- (iii) DNA Polymerase
- (iv) Gene Therapy
- (v) Gene Knockout

P.T.O.

(b) Differentiate between any **four** of the following :
(8)

- (i) Adaptors and Linkers
- (ii) YAC and MAC
- (iii) Plasmid and M13
- (iv) Southern and Northern Blotting
- (v) Transformation and Transfection

(c) Expand the following :
(5)

- (i) BAC
- (ii) NGS
- (iii) SCID
- (iv) SCNT
- (v) RFLP

(d) Write the contributions of the following scientists.
(5)

- (i) Ian Wilmut and Keith Campbell
- (ii) Alec Jeffreys
- (iii) Smith, Nathan and Arber
- (iv) Mario Capecchi & Oliver Smithies
- (v) Boliver and Rodriquez

- (e) Explain any **two** of the following : (2+2)
- (i) Taq polymerase
 - (ii) Transformation efficiency
 - (iii) Plaque hybridization
2. (a) Describe type II restriction endonucleases and explain their mode of action. (7)
- (b) Describe colony hybridization technique for the screening of genomic library. (5)
3. (a) Describe Western Blotting technique in detail with the help of appropriate diagrams. (7)
- (b) Define cloning vectors. Describe the essential features of a cloning vector with suitable examples. (5)
4. (a) Explain the method of producing insect resistant transgenic plants by recombinant DNA technology. (7)
- (b) How was 'Dolly the sheep' created? Explain. (5)
5. (a) What is ex-vivo gene therapy? Describe in detail. (7)

(b) Explain calcium chloride method of transformation.
(5)

6. (a) Explain how recombinant Insulin is produced using recombinant DNA technology.
(7)

(b) Describe the use of TALENS as a tool in gene editing.
(5)

7. Write short notes on any **three** of the following :
(4×3=12)

(a) Molecular diagnosis of Sickle Cell Anaemia

(b) Production of pharmaceuticals in transgenic animals

(c) Microarray

(d) Bacteriophage lambda

(e) Scope of Biotechnology

[This question paper contains 4 printed pages]

Your Roll No.

Sr. No. of Question Paper : 3102

Unique Paper Code : 32237910

Name of the Paper : Reproductive Biology

Name of the Course : B.Sc Hons., LOCF (VI), DSE

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer any **FIVE** questions in all. Question No. 1 is compulsory.
3. Draw well labelled diagrams wherever necessary.

1. (A) Define (**Any five**) : (1×5=5)

(a) Negative feedback regulation

(b) Menopause

- (c) Varicocele
- (d) Endometriosis
- (e) Necrozoospermia
- (f) Fecundity

(B) Differentiate between : (2×4=8)

- (a) Invasive and non-invasive implantation
- (b) Adenohypophysis and Neurohypophysis
- (c) Spermateliosis and Spermiation
- (d) Mullerian duct and Wolffian duct
- (e) Hysterectomy and tubectomy

(C) Expand the following (**Any four**) : (1×4=4)

- (a) IUD
- (b) DAG
- (c) RISUG
- (d) HSD
- (e) PMSG

(D) Match the following :

(1×4=4)

- | | |
|-----------------------|------------------------------|
| (a) Patrick Steptoe | India's first test tube baby |
| (b) Nitya Anand | Contraceptive pill |
| (c) Subhash Mukherjee | Saheli |
| (d) G. P. Talwar | IVF |

(E) Fill in the blanks (**Any three**) : (1×3=3)

- (a) The major hormone responsible for ovulation is _____
- (b) _____ is the condition when testes fail to descend into the scrotal sacs.
- (c) In humans the entire process from spermatogonia to spermiation takes about _____ days.
- (d) _____ is the primary estrogen during pregnancy.

(F) Give the location and mention any **one** function of the following (**any three**) : (1×3=3)

- (a) Leydig cells
- (b) Zona pellucida
- (c) Cowper's gland
- (d) Corona radiata

2. (a) What is spermatogenesis? Explain hormonal regulation of spermatogenesis. (6)
(b) Describe role of Hypothalamo-hypophyseal-ovarian axis in regulation of menstrual cycle. (6)
3. (a) What is fertilization? Describe the molecular events of fertilization with the help of suitable diagram. (8)
(b) What is a pearl index and how does it help to evaluate contraception? (4)
4. (a) Explain the hormonal regulation of lactation. (6)
(b) What are the causes of male infertility? Explain the process of Intracytoplasmic sperm Injection and its significance in managing male infertility. (6)
5. (a) What is the blood-testis barrier? Discuss its importance in spermatogenesis. (6)
(b) What is steroidogenesis? Explain the Two cell two gonadotropin theory with the help of a suitable diagram in females. (6)
6. Write short note on the following (**Any three**):
(3×4=12)
 - (i) Delayed Implantation
 - (ii) PROST
 - (iii) Physiological and biochemical aspect of semen
 - (iv) Feto-placental relationship

24

June 20 24

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 3205

Unique Paper Code : 32237903

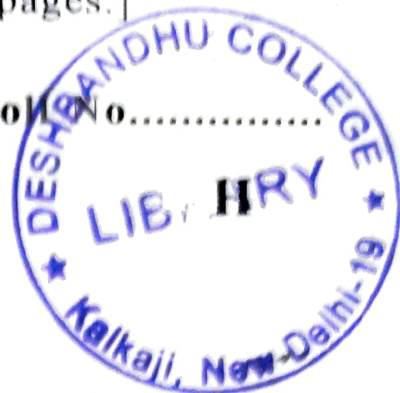
Name of the Paper : Animal Biotechnology

Name of the Course : B.Sc. (H) Zoology

Semester : VI (DSE)

Duration : 3 Hours

Maximum Marks : 75



Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Answer **five** questions in all.
3. Q. No. 1 is compulsory.

1. (a) Define the following : (5)

- (i) Biotechnology
- (ii) Competency
- (iii) Recombinant DNA
- (iv) Transgenesis
- (v) Autoradiography

- (b) Differentiate between the following : (10)
- (i) Type I and Type II restriction endonucleases
 - (ii) Southern and Western Blotting
 - (iii) Transgenic animal and Cloned animal
 - (iv) BAC and YAC vector
 - (v) Genomic and cDNA library

- (c) Expand the following : (5)
- (i) pUC 18
 - (ii) MAC
 - (iii) cDNA
 - (iv) ddNTP
 - (v) GMO

- (d) State the contribution of the following scientists : (3)

- (i) Kary Mullis
- (ii) Karl Ereky
- (iii) Ian Willmut

- (e) Write the importance of following in biotechnology. (4)

- (i) Reverse transcriptase
- (ii) DNA ligase

(iii) Taq polymerase

(iv) Ethidium Bromide

2. (a) Explain the methodology of the production of recombinant insulin with suitable diagram. (7)
- (b) Explain blue white screening using suitable diagrams. (5)
3. (a) Explain Southern blotting with well-labeled diagram. (7)
- (b) Explain briefly CRISPR/Cas 9 system with suitable diagrams. (5)
4. (a) What is somatic cell nuclear transfer technique? Explain with an example. (7)
- (b) How can a transgenic animal be used for production of pharmaceuticals? (5)
5. (a) Describe in detail how is BT crops created using *Agrobacterium* mediated transformation. (7)
- (b) How are herbicide resistant plants created? Explain with one suitable example. (5)

6. (a) How is cystic fibrosis detected using molecular diagnostic techniques? Explain with suitable diagram. (7)
- (b) What is electroporation? Explain with the help of suitable diagrams. (5)
7. Write short notes on any **THREE** of the following : (4×3=12)
- (i) Expression vectors
 - (ii) Illumina sequencing
 - (iii) Knockout Mice
 - (iv) PCR
 - (v) Restriction endonucleases