

26/5/25 R

[illegible]

A circular library stamp in blue ink. The text "DESHBANDHU COLLEGE" is curved along the top inner edge. The word "LIBRARY" is printed in the center. The text "Kalkaji, New Delhi-19" is curved along the bottom inner edge. There are two small stars on the left and right sides of the circle.

P.T.O.

(c) Write the sources of secretion and *one* function of the following : $5 \times 1 = 5$

(i) Progesterone

(ii) GnRH

(iii) ABP

(iv) FSH

(v) Oxytocin.

(d) Fill in the blanks (any *four*) : $4 \times 1 = 4$

(i) Presence of endometrial tissue in fallopian tube leads to

(ii) Injecting single sperm in the cytoplasm of oocyte is termed as

(iii) False contractions during pregnancy is called

(iv) Ovulation is mediated by surge of hormone.

(v) enzyme converts the androgens into estrogen.

(e) Expand the following terms (any *five*) : $5 \times 1 = 5$

(i) AMH

(ii) IUDs

(iii) GIFT

(iv) GVBD

(v) GPCR

(vi) PCOS

2. (a) Discuss various means of hormone based contraception and add a note on their mechanism of action.
(b) Explain any *two* reasons leading to infertility in females and their detection and management strategies. 6,6
3. (a) Diagrammatically explain the process of spermatogenesis in males.
(b) Write a note on the importance of breast feeding. 6,6
4. (a) Describe the steps involved in the fertilization process in humans.
(b) Give a brief note on the accessory sex glands in males. 8,4
5. (a) What is parturition ? Discuss the hormonal regulation of parturition.
(b) Describe the classical mechanism of action of steroid hormones. 8,4
6. Write short notes on (any *three*) : 3×4=12
 - (a) Placenta
 - (b) Hypothalamic-hypophyseal-gonadal axis
 - (c) Hormonal regulation of menstrual cycle
 - (d) Negative feedback mechanism.

This question paper contains **3** printed pages]

Roll No.

27/5/25 &

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : **105**

Unique Paper Code : **32237910**

Name of the Paper : **DSE-Reproductive Biology**

Name of the Course : **B.Sc. (Hons.) Zoology**

Semester : **VI (CBCS-LOCF)**

Duration : **3 Hours**

Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt any *five* questions in all including Question No. 1, which is compulsory.

5×1=5

1. (a) Define of the following terms (any *five*) :

- (i) Decidua
- (ii) Spermiogenesis
- (iii) Vasectomy
- (iv) Ectopic pregnancy
- (v) Cortical reaction
- (vi) Lactational Amenorrhea.

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

4×2=8

- (i) Follicular phase and luteal phase
- (ii) GIFT and ZIFT
- (iii) Acrosome reaction and Cortical reaction
- (iv) Menarche and Menopause
- (v) IUDs and Oral contraceptive pills.

P.T.O.

(c) Expand the following terms :

1×5=5

- (i) ICSI
- (ii) ABP
- (iii) HCG
- (iv) POP
- (v) HSD
- (vi) PVN.

(d) Write the location and *one* function of the following :

1×5=5

- (i) Sertoli cell
- (ii) Montgomery gland
- (iii) Supra optic nuclei
- (iv) Uterine gland
- (v) Corpus luteum

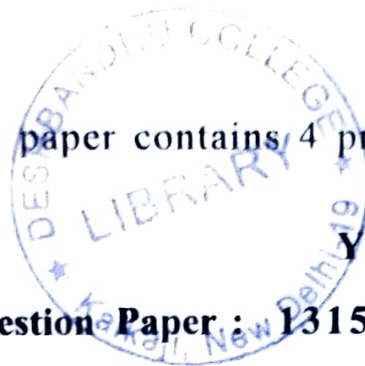
(e) Fill in the blanks :

1×4=4

- (i) is the most potent androgen.
- (ii) During pregnancy, ... is the the most prevalent estrogen in the female body.
- (iii) is the site of fertilization.
- (iv) Pregnancy test detects a hormone present in urine of pregnant female known as

2. Briefly explain the mechanism of action of the peptide hormones acting through GPCR. 12
3. (a) What is spermiogenesis ? Explain the steps in spermiogenesis. 8
(b) Discuss the ethical issues involved in ART. 4
4. (a) Describe the hormonal regulation of parturition. 8
(b) Explain the significance of the hypothalmo-hypophyseal-gonadal axis. 4
5. (a) Describe the various generations of IUD and discuss their mechanism of action for preventing pregnancy. 7
(b) What are the primary causes of infertility in males ? 5
6. Define reproductive cycle. Diagrammatically explain the hormonal profile and the changes in the endometrial lining and ovary that occurs in a normal menstrual cycle. 12
7. Write short notes on any three : 3×4=12
 - (a) Prevention of polyspermy
 - (b) Positive feedback mechanism
 - (c) Features of an ideal contraceptive
 - (d) Constituents of breast milk
 - (e) Functions of placenta.

[This question paper contains 4 printed pages.]



17615 May 2025

Your Roll No.....

Sr. No. of Question Paper : 1315

J

Unique Paper Code : 32231601

Name of the Paper : Developmental Biology

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

Semester : VI (CBCS-LOCF)

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. Attempt **Five** questions in all. Question No. 1 is compulsory.
3. Attempt **all** the parts of a question together.

1. (a) Define :

- (i) Vitellogenesis
- (ii) Window of implantation
- (iii) Invagination
- (iv) Decidua
- (v) Nieuwkoop center

(5)

P.T.O.

(b) Differentiate between the following (**any three**) :

- (i) Epigenesis and Preformation
- (ii) Epimorphosis and Morphallaxis
- (iii) Primary neurulation and Secondary neurulation
- (iv) Epitheliochorial and Haemochorial placenta
- (v) Radial cleavage and Spiral Cleavage (9)

(c) Expand the following :

- (i) ROS
- (ii) DES
- (iii) IVF
- (iv) ABC
- (v) JH (5)

(d) Name the germ layers from which each of the following is derived

- (i) Skin
- (ii) Blood
- (iii) Liver
- (iv) Spleen
- (v) Gut (5)

(e) State the major contributions of the following scientists (**any three**) :

(i) W. Vogt

(ii) J. F. Gudarnatsch

(iii) William Roux

(iv) Hiide Mangold (3)

2. Describe the formation of extra-embryonic membranes in birds. Draw well labelled diagrams. Add a note on significance of each type of extra embryonic membrane. (12)

3. (a) Define gastrulation. With the help of well labelled diagrams describe the formation of gastrula in amphibians. (6)

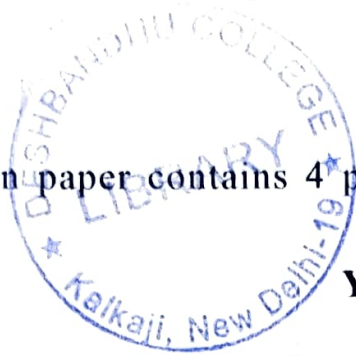
(b) What is primary organiser? Discuss the experiments that led to the discovery of induction. (5)

(c) Explain the following statement "Of all the tissues of early gastrula only one has its fate determined". (1)

4. (a) Describe the process of spermiogenesis with the help of suitable diagram. (6)

- (b) What do you understand by embryonic induction. Explain experiments of embryonic induction on amphibians in detail. (6)
5. (a) What are teratogens? Discuss the effects of teratogens on human embryonic development. (6)
- (b) What is polyspermy? Describe the mechanism of fast block and slow block to polyspermy, respectively? (6)
6. Write short notes on any **three** of the following : (3×4=12)
- (a) Fate maps
 - (b) Models of ageing
 - (c) In vitro fertilisation
 - (d) Regeneration in Salamander limbs
 - (e) Amniocentesis

[This question paper contains 4 printed pages.]



Your Roll No.....

22/5/25

Sr. No. of Question Paper : 1316

J

Unique Paper Code : 32231602

Name of the Paper : Evolutionary Biology (DSC)

Name of the Course : **B.Sc (H) Zoology, 2025
May/June (CBCS-LOCF)**

Semester : VI, (DSC) Theory Examination

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. Do not write anything on the question paper except your Roll Number.
3. Attempt **FIVE** questions in all. Question Number **ONE** is **COMPULSORY**.

1. (I) Define the following (**any five**) : (5)

(a) Chemogeny

(b) Endo-symbiotic theory

(c) Index fossil

P.T.O.

- (d) Phylogenetic tree
- (e) Artificial selection
- (f) Ring species

(II) Differentiate between (**any five**) : (10)

- (a) Lamarckism and Darwinism
- (b) Microevolution and macroevolution
- (c) Continuous and Discontinuous variation
- (d) Founder's effect and bottleneck phenomenon
- (e) Homologous and Analogous Organ
- (f) Phyletic gradualism and punctuated equilibrium

(III) Justify the following statements (**any two**) : (3)

- (a) RNA world hypothesis is crucial for understanding the origin of life.
- (b) Molecular clocks are essential for studying evolutionary timelines.
- (c) Adaptive radiation leads to biodiversity.

(IV) Contribution of scientists (**any five**) : (5)

- (a) Charles Darwin

- (b) Jean-Baptiste Lamarck
- (c) Lynn Margulis
- (d) Gregor Mendel
- (e) Alfred Russel Wallace
- (f) Stephen Jay Gould

(V) Fill in the blanks, (**any four**) : (4)

- (a) _____ was the first fossil in Horse phylogeny.
- (b) In Hardy-Weinberg equilibrium, $p+q =$ _____.
- (c) The K-T extinction event is associated with the extinction of _____.
- (d) The geographical barrier induces _____ speciation.
- (e) _____ is most closely related to humans among primates.

2. (a) Explain the process of fossil formation and the types of fossils with examples. (8)
- (b) Discuss the geological time scale and its significance in evolutionary studies. (4)

3. (a) Describe various types of natural selection using suitable graphs & examples. (8)
- (b) Explain the concept of the molecular clock with an example. (4)
4. (a) Define Hardy-Weinberg equilibrium? State its assumptions. (6)
- (b) What are genetic variations? Explain the role of heritable variations in evolution? (6)
5. (a) Discuss the different modes of speciation. (6)
- (b) Give a comparative account of various species concepts proposed in evolution. (6)
- 6 (a) Describe the causes and effects of mass extinctions specifying K-T extinction. (6)
- (b) Describe various isolating mechanisms with examples. (6)
7. Write short notes (**any three**): (12)
- (a) RNA world
- (b) Human Evolution
- (c) Adaptive radiation
- (d) Genetic Drift

100
This question paper contains 3 printed pages

Roll No.

(26/5/25) H

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 1321

Unique Paper Code : 32237903

Name of the Paper : DSE-Animal Biotechnology

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

Semester : VI (CBCS-LOCF)

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all.

Question No. 1 is compulsory.

All questions carry equal marks.

1. (a) Define the following terms :

5×1=5

(i) Nude mice

(ii) Phagemid

(iii) Probes

(iv) SCID

(v) Transgene.

(b) Differentiate between the following :

3×2=6

(i) Isochizomers and Neoschizomers

(ii) YAC and BAC

(iii) Sanger and Next Generation Sequencing.

P.T.O.

(c) Give the reasons for the following :

3×2=6

- (i) Use of competent cells in process of transformation.
- (ii) Fluorescent bands in Agarose gel electrophoresis.
- (iii) Blue colored colonies in blue and white screening.

(d) Expand the following :

5×1=5

- (i) HAT
- (ii) ddNTP
- (iii) RFLP
- (iv) ZNF
- (v) Amp^R.

(e) Write the contribution of the following scientists :

5×1

- (i) Alec Jeffreys
- (ii) Herbert Boyer
- (iii) Ian Wilmut
- (iv) He Jiankui
- (v) Neal Burnette.

2. (a) Explain the molecular diagnosis and treatment of any genetic disease.

8

(b) What are the differences between in-vivo and ex-vivo gene therapy ? 4

3. (a) What is Ti plasmid ? Explain, how they can be used for production of herbicide resistant plants ? 6
- (b) Explain the mechanism for the production of Dolly. 6
4. (a) Explain the concept of Restriction and give a detailed note on different types of Restriction enzymes. 6
- (b) Discuss the principle and applications of DNA Fingerprinting. 6
5. (a) Discuss, how the gene editing techniques can be used for production of transgenic animals ? 6
- (b) Explain a mechanism for studying the Gene Expression Profiling in a patient with mutations for a particular disease. 6
6. Write short notes on the following (any *three*) : 3×4=12
- (i) Expression Vectors
- (ii) Western Blotting
- (iii) cDNA Libraries
- (iv) Recombinant Insulin.

This question paper contains 4 printed pages|

29 May 2025

Roll No.

--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 1322

Unique Paper Code : 32237903

Name of the Paper : DSE-Animal Biotechnology

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

Semester : VI (CBCS-LOCF)

Duration : 3 Hours

Maximum Marks : 75



(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all.

Question No. 1 is compulsory.

All questions carry equal marks.

1. (a) Define the following terms :

5×1=5

- (i) Transformation
- (ii) Humulin
- (iii) Cosmid
- (iv) Gene knockout
- (v) Transgene
- (vi) Genetically modified organism

(b) Differentiate between the following :

3×2=6

- (i) Probe and primer
- (ii) Plasmid and M13
- (iii) Alkaline phosphatase and polynucleotide kinase

P.T.O.

(c) Write the importance of the following :

6×1=6

- (i) Biosensors
- (ii) Multiple cloning site
- (iii) Alkaline phosphatase and polynucleotide kinase
- (iv) Klenow fragment
- (v) Adapter
- (vi) Amp^r gene

(d) Expand the following :

5×1=5

- (i) BAC
- (ii) NGS
- (iii) SCID
- (iv) EST
- (v) Tetr^R

(e) Write the contribution of the following scientist :

3×1=3

- (i) Smith Nathan and Arber
- (ii) Alec Jeffreys
- (iii) Boliver and Rodriguez

(f) Explain any *two* of the following : 2×1=2

(i) Taq polymerase

(ii) Transformation efficiency

(iii) Plaque hybridization

2. (a) What is cloning vector ? Explain the virus vectors used for gene cloning with suitable examples. 8

(b) Describe colony hybridization technique for screening of genomic library. 4

3. (a) Define restriction enzymes. Elaborate on the basis of its pattern of cleavage, classification and nomenclature of restriction enzymes. 8

(b) Write a note on applications of PCR. 4

4. (a) Describe Western blotting technique in detail with the help of appropriate diagram. 8

(b) Describe the use of TALEN as a tool in gene editing. 4

5. (a) What is ex-vivo gene therapy ? Discuss its importance with respect to any example. 8

(b) Give a brief account of ethical issues concerning from transgenesis. 4

P.T.O.

6. Write short notes on the following (any *three*) :

3×4=12

(i) Diagnosis of CFTR mutation

(ii) Scope of biotechnology

(iii) Southern blotting

(iv) Recombinant insulin.

[This question paper contains 4 printed pages.]



(15) (16)
May 2025

Your Roll No.....

Sr. No. of Question Paper : 5520

J

Unique Paper Code : 2232013601

Name of the Paper : Animal Biotechnology

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

Semester : VI NEP-UGCF

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Answer any **FOUR** questions including **Question No.1** which is compulsory.

1. (a) Define the following (any three): (3)

(i) Cosmid

(ii) Polylinker

P.T.O.

(iii) Plaque

(iv) Packaging cell line

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

(i) Expression vector and cloning vector

(ii) Knockout animal and Transgenic animal

(iii) TALEN and ZFN

(iv) Primer and Probe

(v) BACs and YACS

(c) Mention the contribution of the following scientists
to the field of biotechnology: (4)

(i) Herbert Boyer

(ii) Jennifer Doudna

(iii) Ian Wilmut

(iv) Werner Arber

2. (a) What are restriction enzymes? Describe their types and their role in genetic engineering with suitable examples. (8)
- (b) Illustrate the colony hybridization method for screening of Genomic library. (7)
3. (a) Describe CRISPR/Cas9 system as a targeted gene-editing tool. (8)
- (b) What is gene therapy? How can this technique be employed to treat or prevent a disease? (7)
4. (a) Describe the DNA microinjection method for production of transgenic animals. Add a note on the application of these animals in pharmaceutical industry. (8)
- (b) Discuss various transformation techniques that can be used for introducing foreign DNA into host cells. (7)
5. (a) Explain the use of PCR-oligonucleotide ligation assay in diagnosis of cystic fibrosis. (8)
- (b) Describe the approach used for production of Recombinant Insulin in bacterial system. (7)

P.T.O.

6. Write short notes on any three of the following:

(5×3=15)

- (a) ASO-dot blot assay
- (b) Phage based cloning vectors
- (c) Knock out mice
- (d) Animal cloning

[This question paper contains 8 printed pages.]

Your Roll No.

Sr. No. of Question Paper : 5560

J

Unique Paper Code : 2232013602

Name of the Paper : DSC - Methods in Biostatistics

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

Semester : VI NEP-UGCF

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Use of simple calculator is allowed.
3. Statistical tables should be provided.
4. Attempt **four** questions in all, including Question No.1 which is compulsory

P.T.O.

1. (a) State whether the following statement is true or false. (1 x 4=4)

- (i) Increasing the sample size decreases standard error.
- (ii) If $\beta_2 = 4.15$, the given distribution is platykurtic.
- (iii) The confidence intervals at 95% significance level are narrower than set at 99% level.
- (iv) F distributions are unimodal and skewed to right.

- (b) Explain the following symbols (1×5=5)

(i) H_0

(ii) σ^2

(iii) N

(iv) α

(v) p

(c) Write the contribution of following scientists in biostatistics (1 x 2=2)

(i) William Sealy Gosset

(ii) Siméon Poisson

(d) Distinguish between the following: (2 x 2=4)

(i) Type I and Type II errors

(ii) Point estimation and Interval Estimation.

2. (a) Calculate the mean, variance, standard deviation (S.D.) and coefficient of variance (C.V.) from following data. (8)

Class interval	Frequency
1-3	6
4-6	19
7-9	20
10-12	5

- (b) Given below are mean heights and variances of male and female students in a college:

Mean height (cm): male – 170, female- 160
Variance (cm) : male - 22, female – 12

Find out whether the heights of male or female students are more variable. (3)

- (c) It is known that 30 percent of lentil seeds in a container are infested with *Callosobruchus maculatus*, an insect pest. When 10 seeds are randomly selected from this population, what is the probability that it will contain exactly 4 insect infested seeds? (4)

3. (a) What are the properties of chi square distribution?

Explain main differences between ' χ^2 test of Goodness of Fit' and ' χ^2 test of Independence'.

(4)

- (b) In an experiment, a researcher classified 200 fishes according to the sex and the parasitic infection. The data was tabulated as mentioned below,

Sex	Infected	Uninfected
Males	65	45
Females	35	55

Apply appropriate statistical test to justify that parasitic infection is independent of the sex of fish (Take $\alpha = 0.05$). (7)

- (c) The mean length of 9 earthworms collected from a normal population was found to be 15.8 cm with variance 10.3. Find the 95% confidence intervals of mean. (4)

4. (a) Distinguish between one sample and two sample t - tests. (3)

- (b) Immature mice were divided in two groups. One group was injected with 4IU FSH and the other group left as control. The Gonadosomatic index (GSI) was calculated in both the groups and tabulated as follows

Control	4IU
27	89
41	77
30	66
43	79
33	70

Test the hypothesis that FSH injection has significant effect on GSI of mice at 95% significance level. (7)

- (c) The mean height obtained for a sample of 200 college students is 170 cm with standard deviation

of 2 cm. Do these data provide sufficient evidence that the population mean of college students is 168 cm. Consider the height of students normally distributed. (Use $\alpha = 0.05$). (5)

5. (a) Define - (2)

(i) Correlation and

(ii) Regression

(b) Calculate the coefficient of correlation (r) when the coefficients of regression are $b_{xy} = 0.3$ and $b_{yx} = 2.7$ (3)

(c) The following data show growth, i.e. increase in length of body of a fish (*Labeo rohita*) in a pond, as a function of time;

Time (weeks) :	1	2	3	4	5	6	7	8
Length (cm) :	5	13	16	23	28	35	40	42

P.T.O.

- (i) Draw a scatter diagram on graph paper.
- (ii) Compute the linear regression equation.
- (iii) Predict the length of fish at 9th week.

(2 + 7+1= 10)

6. Write short note on any three

(i) Hypothesis testing

(ii) Confidence Intervals.

(iii) ANOVA

(iv) Applications of Biostatistics in Biological Sciences

(v) Skewness and Kurtosis

(5 x 3 = 15)

(1000)

This question paper contains 3 printed pages]

27/5/25



Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 5550

Unique Paper Code : 2232013603

Name of the Paper : DSC Evolutionary Biology

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

Semester : VI NEP-UGCF

Duration : 2 Hours

Maximum Marks : 60

(Write your Roll No. on the top immediately on receipt of this question paper.)

Draw well-labelled diagrams wherever necessary.

Attempt four questions in all.

Question No. 1 is compulsory.

1. All parts of this question are compulsory : 15

(a) Define the following : 4

(i) Kin Selection

(ii) Darwinian fitness

(iii) Stromatolites

(iv) Genetic load.

P.T.O.

- (b) Differentiate between the following : 6
- (i) Convergent and Divergent evolution
 - (ii) Allopatric and Sympatric speciation
 - (iii) Inversion and Polyploidy mutations.
- (c) Fill in the blanks with appropriate answers : 5
- (i) In large populations will be the primary micro evolutionary force responsible for changing allele frequencies, while will be prominent in smaller populations often leading to non-adaptive evolution.
 - (ii) Lynn Margulis is credited for the
 - (iii) is the largest extinction in the history of life on earth.
 - (iv) is also commonly referred to as dawn horse.
2. (a) Give a brief description of theory of biochemical origin of life on earth. How were the primary environmental conditions conducive to origin of life on earth ? 7+2
- (b) Comment on the causes and evolutionary consequences of K-T mass extinction. 6
3. (a) Discuss the different ways in which organic variations provide raw material for evolution ? 8

- (b) Describe the various prezygotic isolating mechanism with suitable examples. 7
4. (a) Discuss the salient features of natural selection. Detail their various types with suitable graphs and examples. 3+9
- (b) Elaborate the merits and demerits of biological species concept. 3
5. (a) Tabulate the trends in the evolutionary progression of horse phylogeny with reference to important fossil records. 8
- (b) Explain the various ways in which Genetic drift can operate on populations. 7
6. Write short notes on any *three* of the following : 5,5,5
- (a) *Australopithecus*
- (b) Neutral theory of molecular evolution
- (c) Geological time scale
- (d) Lamarckism
- (e) Adaptive resemblances.

This question paper contains 3 printed pages|

02/6/25 n

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

S. No. of Question Paper : 8059

Unique Paper Code : 2233010017

Name of the Paper : DSE-Research Methodology

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

Semester : VI (NEP-UGCF)

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all, including Question Number 1,
which is compulsory.

1. (a) Define the following :

5

- (i) Research
- (ii) Trademark
- (iii) Commercialization
- (iv) References
- (v) Abstract.

(b) Expand the following abbreviations :

5

- (i) APA style
- (ii) WIPO
- (iii) CCSEA
- (iv) PCT
- (v) DOI.

P.T.O.

(c) Differentiate between the following : 15

- (i) Primary data and Secondary data
- (ii) Research methods and Research methodology
- (iii) Research paper and review article
- (iv) Index & Appendix
- (v) Systematic sampling and Stratified sampling.

(d) True or false : 5

- (i) Paraphrasing means rewriting, what someone else has written in your own words.
- (ii) Acknowledging the source with a reference and placing the words in quotation marks is required, if you use someone else's exact words.
- (iii) Patents are valid for a lifetime.
- (iv) Open-access journals allow free access to research papers.
- (v) Research fellowships are awarded based on academic merit.

2. Describe the CCSEA guidelines for the care and handling of laboratory animals. 15

3. (a) What is intellectual property and why should we protect it ? 5

(b) Write notes on copyrights and patent laws. 10

4. (a) Describe the various types of research. 12
(b) Write a note on oral presentation. 3
5. Describe the various probability sampling and non-probability sampling methods with suitable examples. 15
6. (a) Define the term plagiarism. Write a note on the various types of plagiarism. 8
(b) Define the term citation. Why is citing sources important in research ? 7
7. Write short notes on (any *three*) : 3×5=15
- (a) Acknowledgement (Research paper/Review article)
 - (b) Research grants
 - (c) Benefits of using plagiarism detection tools
 - (d) Fellowships
 - (e) Data presentation using digital tools (any *two*).