(24)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5540 **J**

Unique Paper Code : 2232012401

Name of the Paper : DSC – Comparative Anatomy of Vertebrates

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

Semester : IV

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. Attempt four questions in all.
3. Question No. **1** is compulsory.
4. Draw well labelled diagrams wherever necessary.

1. (a) Define the following **(any four)** : (4)

(i) Corpus callosum

(ii) Neurocranium

(iii) Craniostyly

(iv) Iter

(v) Carapace

(vi) Holobranch

(b) Differentiate between the following **(any two)** : (4)

(i) Amphicoelous and heterocoelous centrum

(ii) Uteri duplex and uteri simplex

(iii) Horns and antlers

(iv) Ductus caroticus and ductus arteriosus

(c) Give exact location and function of the following **(any four)** : (4)

(i) Fovea centralis

(ii) Spiracle

(iii) Aqueduct of Sylvius

(iv) Jacobson's organ

(v) Helicotrema

(vi) Foramen of panizzae

(d) State whether following statements are True/False **(any three)** : (3)

(i) Mammalian skulls have a single temporal fossa.

(ii) The neurocranium of chondrichthyes is well ossified.

(iii) Cerebrospinal fluid is secreted by choroid plexus.

(iv) Post ganglionic fibres of parasympathetic nervous system are adrenergic.

(v) All mammals have seven cervical vertebrae.

2. (a) Briefly discuss the comparative account of stomach in amniotes. (6)

(b) What are the different hard derivatives of epidermis of skin in vertebrates? (9)

3. (a) Classify receptors based on their functions and give examples. (6)

(b) With the help of labelled diagrams, illustrate the evolution of aortic arches in vertebrates. (9)

4. (a) Discuss the evolution of vertebrate kidney with the help of labelled diagrams. (12)

(b) What is the name, nature and innervations of VII cranial nerve in mammals? (3)

5. (a) Explain the structure and function of mammalian ear with the help of suitable diagrams. (9)

(b) Describe the structure of the gills in cartilaginous and bony fishes. (6)

6. Write short notes on **any three** of the following : (3×5=15)

(i) Fate of first two visceral arches

(ii) Swim bladder

(iii) Scales in fishes

(iv) Male genital ducts

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5600 **J**

Unique Paper Code : 2232012402

Name of the Paper : DSC – Developmental Biology

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

Semester : IV – NEP

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. Attempt any **four** questions including Question No. **1** which is compulsory.
3. Draw well-labelled diagrams wherever necessary.

1. (a) Define the following : (4)

   (i) Primary Organizer

   (ii) Delamination

(iii) Spermateliosis

(iv) Gray crescent

(b) Distinguish between the following **(any two)** : (2×2=4)

(i) Autonomous and conditional specification

(ii) Hensen's Node and Nieuwkoop Center

(iii) Yolk Sac and Yolk Plug

(c) Match the following : (2)

(i) J.F. Gudematsch	a. Phocomelia
(ii) Thalidomide	b. Salamander regeneration
(iii) Spallanzani	c. Epigenesis
(iv) Caspar Friedrich Wolff	d. Amphibian metamorphosis

(d) Expand the following abbreviations : (3)

(i) AGE

(ii) DLHP

(iii) PTTH

(e) Name the germ layer from which each of the following is derived : (2)

(i) Notochord

(ii) Lungs

(iii) Adrenal Cortex

(iv) Lens

2. (a) Describe the process of metamorphosis in amphibians. Explain the role of hormones in regulating this transformation. (8)

(b) What is a fate map? Describe the different techniques used to construct fate maps. Draw a well-labelled fate map of the blastula stage of a frog. (7)

3. (a) Define regeneration. Explain the process of epimorphic regeneration with a suitable example, highlighting the key stages involved. (8)

(b) Discuss the process by which the spermatid transforms into spermatozoa. (7)

4. (a) Define placenta and describe its different types based on morphological and histological criteria with suitable examples. (9)

(b) Describe the various types of cleavage patterns in animal embryos based on the amount and distribution of yolk. Support your answer with suitable examples. (6)

5. (a) Describe the extra-embryonic membranes in a chick embryo and explain their formation and function. (8)

(b) Define gastrulation. Illustrate and describe the various morphogenetic movements involved in gastrulation, with specific examples from amphibian embryonic development. (7)

6. Write short notes on **any three** of the following : (3×5=15)

(a) French Flag Model

(b) Blocks to polyspermy

(c) Embryonic stem cells

(d) Teratogens

(e) Ageing

This question paper contains 3 printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **5679**

Unique Paper Code : **2232012403**

Name of the Paper : **DSC : Animal Behaviour**

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

Semester : **IV (NEP-UGCF)**

Duration : **2 Hours** Maximum Marks : **60**

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

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

1. (*a*) Define any *four* of the following terms : 4×1=4

(*i*) Ethogram

(*ii*) Inclusive Fitness

(*iii*) Mnemotaxis

(*iv*) Latent Learning

(*v*) Polyphenism

(*vi*) Alloparental behavior.

P.T.O.

(*b*) Distinguish between any *three* of the following : 3×2=6

(*i*) Orthokinesis and Klinokinesis

(*ii*) Hormone and Pheromone

(*iii*) Intersexual and Intrasexual selection

(*iv*) Eusocial and Subsocial species

(*v*) Habituation and Sensitization

(*c*) Match the following scientists with their contributions : 5×1=5

Column A	**Column B**
(*i*) Konrad Lorenz	Communication in bees through waggle dance
(*ii*) Oskar Heinroth	Theories of parental investment and reciprocal altruism
(*iii*) W.D. Hamilton	Innate behaviour patterns
(*iv*) Karl von Frisch	Studied imprinting in birds
(*v*) Robert Trivers	Theory of inclusive fitness and Kin selection

2. (*a*) Explain associative learning. Add a note on Skinner's experiment to describe operant conditioning. 8

(*b*) Classify and explain the orientation behaviour with the help of suitable examples. 7

3. (*a*) Describe various types of dances performed by forager honeybees. With the help of diagram explain the distance and direction component of waggle dance. 8

(*b*) What is stimulus filtering ? With suitable example explain its biological significance. 7

4. What is altruism in animal behaviour ? Explain its different types with examples. Why do some animals exhibit altruistic behaviour despite potential risks to their own survival ? 15

5. Explain the concept of male rivalry in animals. Describe *three* distinct ways in which males complete for mates and briefly discuss the advantages gained by the winning male. 15

6. Write short notes on any *three* of the following : 3×5=15

(*a*) Innate behaviour

(*b*) Courtship behavior

(*c*) Imprinting

(*d*) Code breaker

(*e*) Artificial intelligence.

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This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **8061**

Unique Paper Code : **2233012006**

Name of the Paper : **DSE-4, Cell Growth and Regulation**

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

B.Sc. Life Science, NEP

Semester : **IV**

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 No. **1** which is compulsory.

Illustrate your answers with well-labelled diagrams wherever necessary.

1. (*a*) Define the following : 6×1

(*i*) Lamins

(*ii*) Signal integration

(*iii*) Consensus sequences

(*iv*) iPS cells

(*v*) Metastasis

(*vi*) APC

P.T.O.

(*b*) Differentiate between the following : 5×2

(*i*) Primary and immortal cell lines

(*ii*) Endocrine and synaptic signaling

(*iii*) Mitosis and meiosis

(*iv*) Repressing elements and silencers

(*v*) Apoptosis and necrosis.

(*c*) Write the significance of the following : 5×1

(*i*) Restriction point

(*ii*) Adenylyl cyclase

(*iii*) Histone tails

(*iv*) 'Eat me' signals

(*v*) Contact inhibition.

(*d*) Give the major contribution of the following scientists : 4×1

(*i*) Linda Buck and Richard Axel

(*ii*) Kazutoshi Takahashi and Shinya Yamanaka

(*iii*) Robert Horvitz

(*iv*) J.M. Bishop and H.E. Varmus.

(*e*) Fill in the blanks : 5×1

(*i*) ..... causes breakdown of nuclear envelope during late prophase.

(*ii*) Eicosanoids bind to ..... *receptors.*

(*iii*) Presence of tryptophan for a bacterium can lead to ..... of its tryptophan operon.

(*iv*) Conversion of one type of mature somatic cell into another type is called .....

(*v*) The type of signaling that a cancer cell utilizes to stimulate its growth is called .....

2. Compare signaling through a cell surface receptor and an intracellular receptor to bring out similarities and differences between the two pathways. Suitably illustrate your answer. 15

3. (*a*) What are the components of cell cycle control system ? Explain the mechanisms by which they work and can themselves be regulated ? 7

(*b*) What are the various cell cycle checkpoints and how do they work ? 8

4. (*a*) Explain the concept of positive and negative gene regulation. 5

(*b*) Describe briefly the various ways in which activators can regulate gene expression in eukaryotes. 8

(*c*) How does euchromatin differ from heterochromatin with respect to gene expression ? 2

5. Explain with suitable diagrams, the extrinsic and intrinsic pathways of apoptosis. Add a note on regulation of intrinsic pathway. 10,5

6. Describe the various molecular mechanisms by which proto-oncogenes and tumor-suppressor genes can be activated and deactivated, respectively, to cause cancer. Explain your answer by giving *one* example of each. 15

7. Write short notes on any *three* of the following : 3×5

(*a*) Tumor viruses

(*b*) Secondary messengers

(*c*) DNA-binding domains

(*d*) Stem cells in therapy.

This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | |

S. No. of Question Paper : **8063**

Unique Paper Code : **2233012008**

Name of the Paper : **DSE-8, Parasitology**

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

Semester : **IV, (DSE-8)**

Duration : **3 Hours** Maximum Marks : **90**

(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.

1. (*i*) Explain the following terms : 5×2=10

(*a*) Incubation period

(*b*) Facultative parasite

(*c*) Schizogony

(*d*) Strobila

(*e*) Apolysis.

P.T.O.

(*ii*) Match the following terms in the column A with the organism in column B : 5

'A'	'B'
(*a*) Organ of Berlese	(*i*) Flea
(*b*) Promotal Comb	(*ii*) *Plasmodium vivax*
(*c*) Sporozoite	(*iii*) *Cimexlectularius*
(*d*) Oncosphere	(*iv*) *Schistosoma* spp.
(*e*) Gynaecophoric canal	(*v*) *Taenia solium*

(*iii*) Differentiate between any *five* of the following terms : 5×2=10

(*a*) Primary host and Secondary host

(*b*) Parasite and Host

(*c*) Gravid and Mature proglottid

(*d*) Epidemic and Endemic disease

(*e*) Monogenetic and Digenetic life history

(*f*) Head louse and Body louse.

(*iv*) Write the vector of the following : 5

(1) Cholera

(2) Malaria

(3) Leishmaniasis

(4) Elephantiasis

(5) Plague.

2. What is digenetic life cycle ? Explain it with reference to life history of *Fasciolopsis buski*. 15

3. Explain the life cycle, pathogenicity and control of *Trichinella spiralis*. 15

4. What are the clinical manifestations of *Wuchereria bancrofti* ? How is it transmitted, diagnosed and treated ? 15

5. Discuss in detail about the morphology, life-cycle and pathogenicity of *Trypanosoma gambiense*. 15

6. (*i*) With the help of a neat and labelled diagram write detailed note on the life cycle of *Xenopsylla cheopis*. 7

(*ii*) State the habit and habitat of *Xenopsylla cheopis*. Give the medical importance of this insect. 8

7. Write short notes on any three of the following : 3×5=15

(a) Ascariasis

(b) Life cycle of *Entamoeba histolytica*

(c) Biology of *Pediculus humanus*

(d) Vampire bat

(e) Life cycle of *Ascaris lumbricoides*.

[This question paper contains 4 printed pages.]

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

(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 **3** printed pages]

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 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

(i) Draw a scatter diagram on graph paper.

(ii) Compute the linear regession 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)

(32)

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Roll No. | | | | | | | | | | |

S. No. of Question Paper : **8057**

Unique Paper Code : **2233010015**

Name of the Paper : **DSE-Human Endocrinology**

Name of the Course : **B.Sc. (H) 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 any *five* questions, including

Question No. 1, which is compulsory.

1. (*a*) Define the following terms : 1½×6=9

(*i*) Sleep apnea

(*ii*) Neurohormone

(*iii*) Osteoporosis

(*iv*) Goitre

(*v*) Virilism

(*vi*) Trophic Hormones

P.T.O.

(*b*) Differentiate between the following : 2×4=8

(*i*) Zona glomerulosa and Zona Fasciculata

(*ii*) Receptor agonist and antagonist

(*iii*) Somatotropin and Somatostatin

(*iv*) Type I and Type II diabetes

(*c*) Give the full form of the following abbreviations (any *six*) : 6×1=6

(*i*) DHEA

(*ii*) 3β HSD

(*iii*) HRE

(*iv*) DAG

(*v*) MSH

(*vi*) PVN

(*vii*) GnRH.

(*d*) Match the following : 1×7=7

S.N.	Column A	Column B
1	Tamoxifen	Cortisol
2	PRL	Thyroxine
3	Immunosuppressant	Antiestrogen
4	TSH	Adenohypophysis
5	Endogenous rhythms	Hypothalamus
6	Mineralocorticoids	Pineal gland
7	Dopamine	Adrenal gland

2. (*a*) Briefly describe the positive feedback mechanism of hormones using a suitable example.

(*b*) Describe the GPCR-mediated signaling pathways of peptide hormones involving different second messenger systems with examples. 5,10

3. (*a*) The pineal gland is considered as the biological clock of the body. Comment

(*b*) Elaborate on the different types of disorders of the pituitary gland, clearly identifying their causes and symptoms. 5,10

4. (*b*) Explain the process of blood glucose regulation with emphasis on the role of insulin and glucagon

(*b*) Discuss the functions of hormone released from the Parathyroid. 10,5

5. (*a*) Diagrammatically explain the histology and the function of the Adrenal gland.

(*b*) Explain the significance of the renin-aldosterone-angiotensin system. 10,5

P.T.O.

6. Write short notes on any *three* of the following : 3×5=15

(*a*) HRT in menopause

(*b*) Receptor tyrosine kinase

(*c*) Thyroid gland disorders

(*d*) Cushing syndrome.

(33)

This question paper contains 3 printed pages]

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*).