

Code No.

**G – 1913**

## Ph.D. ENTRANCE EXAMINATION, MAY 2019

Time : 3 Hours

Max. Marks : 100

### **Instructions :**

- 1) Answer **any ten** questions from Part/Section A and B.
- 2) **All** questions carry **equal** marks.
- 3) Candidates should clearly indicate the **Part/Section, Question Number and Question Booklet Code** in the answer booklet.
- 4) The candidates are **permitted** to answer questions **only** from the subject that comes under the **faculty** in which he/she seeks registration as indicated in the **application** form

Name of candidate

Register Number

Answer Booklet Code

Signature of Candidate

Signature of Invigilator

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### **FACULTY OF APPLIED SCIENCE, EDUCATION & PHYSICAL EDUCATION**

1. **Biotechnology**
2. **Environmental Sciences**
3. **Faculty of Education – Education**
4. **Faculty of Physical Education – Physical Education**

**1. Biotechnology**

**Part – A**

**Research Methodology**

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. Explain the relevance and implications of scientific experimental researches in the field of Biotechnology.
2. Differentiate quantitative and qualitative researches with general characteristics and suitable examples.
3. Write briefly about basic steps involved in a research process.
4. Explain the role of literature review in designing research problems and working hypothesis?
5. What are the basic features of a good research design? What all are the important concepts upon which a research design is built?
6. With suitable examples discuss the importance of statistical packages in data analysis.
7. How will you analyze that the outcome of a research is statistically significant or not?

8. What are the different types of sampling methods? What are different sampling errors?
9. Write briefly about the measures of central tendency and variation? What are their roles in data analysis?
10. Discuss any two methods used for of linear regression analysis: elaborate its utility and limitations.
11. With the help of a neat diagram, explain the structure and components of scientific reports.
12. What is the importance of visual presentation in communicating scientific data? How can you make a presentation effective?
13. What is the role of ethical committees? Write about the significance of maintaining ethics in scientific research?
14. What are the different types of Intellectual property rights? How is it protected among research communities?
15. Define plagiarism. Why is it important to eliminate plagiarism in scientific reports and how it is attained?

## Part – B

### Biotechnology

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. Elaborate the difference between primary and secondary databases of nucleic acids and proteins with suitable examples.
2. With suitable example outline the cloning and over expression of an heterologous gene in eukaryotic system.
3. Discuss the issues related to patenting of live organisms: microbes, plants and animals
4. Briefly outline the principle and utility of Mass spectrometric methods in protein analysis.
5. What is meant by autophagy? How is it different from necrosis and apoptosis?
6. What is meant by Marker Assisted Selection? Discuss its roles and importance in crop improvement.
7. Differentiate between probiotics and prebiotics with suitable examples. Explain the importance of this in food and nutritional Biotechnology.

8. Elaborate the mass transfer and heat transfer resistances in a bioprocess and derive a suitable mathematical expression for these.
9. Explain the methodology, advantages and limitations of bioremediation using microbes.
10. Briefly explain the impact of next generation sequencing on genome analysis.
11. Write note on the basic methods used for gene transfer to animal cells.
12. Discuss the principle, methodology and importance of live cell imaging.
13. Discuss how antibody diversity is achieved to counter enumerable diseases that are encountered by higher living beings.
14. Explain the principle and importance of CRISPR/Cas system as a gene editing tool.
15. Define concentration terms: Molarity, Normality and percentage solutions. Calculate the Molarity, Normality and percentage solutions; when 40 g of NaOH dissolved in 500 ml water (MWt of NaOH is 40 and neglect the change in volume on dissolution of the NaOH in water).

## 2. Environmental Sciences

### Part – A

Answer **any 10** of the following.

**(10 × 5 = 50 Marks)**

1. What do you mean by research? Explain about different types of research.
2. Explain about intellectual property rights.
3. Explain the applications of electron microscope.
4. Explain Beer - Lamberts law.
5. Discuss the environmental applications of titrimetric analysis.
6. Explain the factors while determining the sample size.
7. Write down the significance of literature review in research design.
8. Write a note on regression analysis.
9. Explain the consequences of plagiarism in research.
10. Explain the working principle of HPLC.
11. Explain the theory of chromatographic separation.
12. Write a short note on gravimetric analysis.
13. Explain the procedure for testing.
14. Explain the various method of measure of central tendency.
15. Explain the steps involved in doctoral research process.

**Part – B**  
**Environmental Sciences**

Answer **any 10** of the following.

**(10 × 5 = 50 Marks)**

1. Explain the structure of an ecosystem.
2. Define population? Explain about commensalism with an examples.
3. Write a short note on fossil fuel.
4. Differentiate insitu and exsitu conservation.
5. Write the importance of disaster management during floods.
6. Explain the factors affecting climate.
7. Explain the structure of the atmosphere.
8. Write a note on bioventing and biosparging.
9. Explain the factors involved in designing of an incinerator.
10. Differentiate BOD and COD.
11. Explain the nitrogen cycle.
12. Explain about Cost benefit analysis.
13. Explain the importance of Public hearing in EIA.
14. Explain the categories of biomedical waste.
15. Define and explain the concept of sustainable development.

**3. Education**

**Part – A**

**Research Methodology**

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. What is the Observational Method of Research?
2. Write a short notes on probability sampling methods.
3. Give example for Likert's scale.
4. Define the term 'personal interview'.
5. Differentiate open-ended questions from close-ended questions.
6. What is Factor analysis?
7. Briefly explain any two sampling methods.
8. List out the essential components of a research report?
9. What do you mean by Type I error and Type II error.
10. Bring out the advantages of Multiple regression analysis.
11. Discuss the various sources of collecting secondary data.
12. Bring out the advantages of Review of related literature.
13. What are the different types of hypotheses?
14. List out the qualities of a research scholar in Education.
15. Write short notes on Case study.



**Part – B**  
**Education**

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. How is motivation useful for achievement?
2. Write a short notes on classical conditioning.
3. What are the socio-emotional characteristics of adolescents?
4. Write down various features of Psycho-analytic approach of Personality as advocated by Freud.
5. Suggest measures to enhance creativity of learners.
6. What is the nature of defence mechanism? Discuss compensation and escape as defence mechanism.
7. List out the Educational Implications of Thorndike Connectionism.
8. Briefly explain the aims of education, curricula and methods of Teaching according to Realism.
9. What do you mean by 'Equality of Educational Opportunity'?
10. Briefly explain the Educational Philosophy of Swami Vivekananda.
11. Write a short notes on Social Constructivist theory.
12. How does Education facilitate salient cultural change?
13. What is social stratification?
14. How would you develop National Integration?
15. Differentiate: 'IQ' and 'EQ'.

**4. Physical Education**

**Part – A**

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. Define research and explain its scope in physical education.
2. Write a note on classification of research.
3. How will you locate a research problem? Discuss.
4. Explain the attributes of a survey study.
5. Differentiate between primary and secondary data with suitable examples.
6. Write the steps in Historical.
7. Explain the importance of experimental research.
8. List the experimental designs and explain any one.
9. What is a hypothesis? Explain the different types of hypothesis.
10. Discuss the need for surveying related literature.
11. Explain the non-probability methods of sampling.
12. Write a note on significance of research proposal.
13. Explain the front and back materials of a thesis.
14. Discuss the mechanics of writing research report.
15. Write a detailed note on bibliography writing.

## Part – B

### Physical Education

Answer **any 10** questions. **Each** question carries **5** marks. **(10 × 5 = 50 Marks)**

1. Discuss the characteristics of different muscle fibers.
2. Write the effects of exercises and training on lung volumes and capacities.
3. Give an account of Shat Kriyas.
4. How will you establish the reliability of a test? Explain.
5. Explain the Mor-Christian general soccer ability test.
6. Enlist modern playing, measuring and protective equipment used in sports.
7. Write a note on measures of dispersions.
8. Explain the application of Newton's laws of motion in the field of sports.
9. How will you prevent sports? Explain.
10. 'Good public relations in sports is utmost important' – Justify.
11. Discuss the health hazards of doping in sports.
12. Explain the methods of improving speed.
13. Describe the role of nutrition in sports.
14. Write the difference between group cohesion and group dynamics.
15. Discuss the management of stress through physical activities.