

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

(CCSS)

Forensic Science

FSC 2C 10—BIOLOGICAL EVIDENCE AND INSTRUMENTAL
TECHNIQUES—BIOLOGICAL

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write an essay on any *two* of the following. Each question carries 15 marks :

- 1 Write in detail about composition of blood and describe its utility in forensic investigation.
- 2 A document is sent for comparison with the questioned sample, there is suspicion on its origin. How will you examine the paper for similarities by its pulp ?
- 3 Explain in detail about location, collection and evaluation of semen as biological evidence.
- 4 Describe the various methods of determining time since death in Forensic Medicine.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following. Each question carries 10 marks :

- 5 What are Diatoms. Explain the identification methods of Diatoms and its specificity.
- 6 Describe the process of facial reconstruction techniques.
- 7 Application of forensic anthropology in crime investigation.
- 8 Procedure of extraction of DNA from charred human remains.
- 9 FTA Card and its application.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following. Each question carries 4 marks :

- 10 Forensic significance of mitochondrial DNA.
- 11 Explain the procedure of absorption elution technique. Mention its forensic application.

Turn over

- 12 How blood spatter analysis helps in reconstruction of crime scene ?
- 13 Application of Forensic entomology in estimation of time since death.
- 14 Cloning and its forensic application.
- 15 Bite mark analysis.
- 16 Relevance of salivary cells and proteins in forensic investigation.
- 17 Utility of examination of human hair in forensic identification.

(5 × 4 = 20 marks)

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SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

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Forensic Science

FSC 2C 09—CHEMICAL EVIDENCE AND INSTRUMENTAL TECHNIQUES-CHEMICAL

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write an essay on any *two* of the following :

- 1 Write a detailed note on how you would process an explosion crime scene, the various steps involved in crime scene management after post blast with a suitable case study.
- 2 Explain in detail the working principle of NMR spectroscopy.
- 3 'Drug abuse in the athlete population may involve doping in an effort to gain a competitive advantage' - give your views on the statement in regard to drug abuse in sports.
- 4 The R_f value of 2 compounds tested in TLC was found to be same. What does this signify ? On what factors does the R_f value of a compound depend ?

(2 × 15 = 30 marks)

II. Write short essay on any *three* of the following :

- 5 Give the classification of poisons with example.
- 6 Give a brief description about designer drugs with examples.
- 7 A person suffering from hypoglycaemia, which according to you is the best way to administer glucose to his/her body ? Explain.
- 8 Give various isolation and extraction methods for non-volatile poisons from biological fluids.
- 9 What is the difference between precipitation and agglutination based assays ?

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following :

- 10 What are the elements in the cycle of fire ?
- 11 Dosage depends on the mode of administration. Do you agree ? Justify your answer.
- 12 Name a few adulterants used in petroleum products.

Turn over

- 13 What are the signs and symptoms of addiction ?
- 14 Differentiate between accelerants and initiators.
- 15 What are IEDs ? Brief on any one type of IED.
- 16 How will you identify the presence of fungicide from biological metrics ?
- 17 Write a note on the factors affecting the effect of poison.

(5 × 4 = 20 marks)

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SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

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Forensic Science

FSC 2C 08—DIGITAL AND CYBER EVIDENCE

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

*Write an essay on any **two** of the following.*

1. Mention three major data storage technologies with suitable example and explain their working.
2. What properties are desirable on evidence and process in a legal setting ?
3. How many layers are there in OSI model ? Mention and explain each layer.
4. What are the components of an E-mail ? Explain bottom to top approach.

(2 × 15 = 30 marks)

*Write short essays on any **three** of the following.*

5. Give out the hierarchy of computer memory and explain.
6. What are the factors effecting in tracing SMTP initiated E-mail ?
7. Elucidate on any five routing protocols.
8. Write step by step procedure involved in analysis of a storage media.
9. How does rooting differ from Jail breaking ? What is the forensic significance of them ?

(3 × 10 = 30 marks)

*Write short notes on any **five** of the following.*

10. Write a brief note on computer booting process.
11. Expand and explain BIOS.
12. List out must have tools in an incidence response toolkit.
13. What is DDoS ? How is it executed ?
14. Differentiate between static and dynamic NAT.
15. What all information can be gathered using live packet capturing tool like Wireshark ?
16. Explain the importance of cache memory as an artifact.
17. What are the challenges of cloud forensics ?

(5 × 4 = 20 marks)

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Forensic Science

FSC2C07—PHYSICAL EVIDENCE AND INSTRUMENTAL TECHNIQUES—PHYSICAL

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write an essays on any *two* of the following. Each question carries 15 marks :

- 1 Write an essay on the historical development of fingerprint Science.
- 2 Describe the classification of fire arms with suitable examples.
- 3 What are the various types of paints? What are their ingredients? Add a note on their collection in a road traffic accident.
- 4 Describe the concepts of Electron Microscopy. Differentiate the SEM from TEM Add a note on the types of samples amenable to be examined under each.

(2 × 15 = 30 marks)

II. Write a short essays on any *three* of the following. Each question carries 10 marks :

- 5 Describe the procedure of taking the fingerprints of a living individual.
- 6 What is a Questioned Document ? Give the scope of forensic Document Examination.
- 7 Explicate the anatomy of ammunition.
- 8 Give the methods of casting a sunken foot print on sandy soil.
- 9 Discuss the concept of Atomic Absorption Spectroscopy. Add a note on the samples examined by AAS.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following. Each question carries 4 marks :

- 10 Describe the Classification of Lip Prints made by Santos.
- 11 Write a note on the importance of natural variations in handwriting and signatures.

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

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Environmental Science

ESW 2C 10—REMOTE SENSING AND GIS

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Essays)

*Answer any **two** out of the following three questions.
Each question carries 10 marks.*

1. What is GIS ? Detail on geographical data processing and analysis.
2. Briefly describe the history and evolution of Remote Sensing technology in India.
3. Write an essay on aerial photogrammetry detailing the elements of aerial photo interpretation.

(2 × 10 = 20 marks)

Part B (Short Answers)

*Answer any **eight** out of the following ten questions.
Each question carries 5 marks.*

4. What are the environmental applications of GIS ?
5. Write a note on Remote Sensing sensors.
6. Explain the concept of data models in GIS. What are the two types ?-
7. Write a brief note on the principle and working of Theodolite.
8. What are the major types of geographical analysis done in GIS ?
9. What is the technology involved in GPS ? What are its applications ?
10. Briefly describe the theory and concept of Remote Sensing Technology.
11. What are the different methods of measuring distance in Cartography ?
12. Enumerate in detail the different methods of aerial photography.
13. What are Topographical maps ?

(8 × 5 = 40 marks)

Turn over

Part C (Very Short Answers)

*Answer any **ten** out of the following twelve questions.*

14. Passive remote sensing
15. Map Grids.
16. Give two examples of licensed GIS softwares.
17. Topography.
18. Map scale.
19. Image correction.
20. Abeny level.
21. Non-Spatial data.
22. Small scale maps.
23. DIP.
24. Query analysis.
25. INSAT.

(10 × 2 = 20 marks)

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2021

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Environmental Science

ESW 2C 09—HYDROLOGY AND WATER RESOURCE MANAGEMENT

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

*Answer any **two** of the following.
Each answer not to exceed 500 words.*

1. Write an essay on the issues related to river-linking in India.
2. Give an inventory of Earth's water resources.
3. Elaborate on flood management.

(2 × 10 = 20 marks)

Part B

*Answer any **eight** of the following.
Each answer not to exceed 250 words.*

4. Give an account of ground water usage pattern of urban and rural dwellers.
5. Discuss the origin of ground water.
6. How does precipitation occur ? What are the types ?
7. Describe Flood Frequency Analysis.
8. What is storage co-efficient ?
9. What does hydrometeorology deal with ?
10. Comment on the global distribution of water.
11. How are aquifers replenished ? Give a detailed account.

12. Write a brief note on ground water monitoring.
13. Write a note on ground water flow.

(8 × 5 = 40 marks)

Part C

*Answer any ten of the following.
Each answer not to exceed a paragraph.*

14. Define Probable Maximum Precipitation.
15. Define Seepage.
16. What is Watershed ?
17. Define Hydrogeology.
18. What is water table ?
19. Differentiate steady flow and unsteady flow in channel flow ?
20. What are flood plains ?
21. What is a Culvert ?
22. Define stem flow.
23. What is hydraulic head ?
24. What is Bedrock ?
25. What is drainage basin ? How is it formed ?

(10 × 2 = 20 marks)

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Environmental Science

ESW 2C 08—ENVIRONMENTAL MICROBIOLOGY AND BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A*Answer any **two** of the following.**Each answer not to exceed 500 words.*

1. Write an essay on biosensors. The concept, principles and development.
2. Write an essay on aquatic macrophyte based wastewater treatment systems.
3. How biotechnological principles are applied to curb air pollution problems ? Write an essay on it.

(2 × 10 = 20 marks)

Part B*Answer any **eight** of the following.**Each answer not to exceed 250 words.*

4. List out the uses of microbes in mining industry. Give a brief explanation.
5. Detail the principle of microbial degradation of pesticides. Write a brief note on the degradation any one of the pesticide.
6. Write a short note on biopolymers ? What are the benefits of these ?
7. Comment on the importance of microbes in environment.
8. What is 16 s rRNA ? What is the rationale in using this for microbial community study ?
9. Write a note on bio-desulfurization of coal.
10. What is the role of microorganisms in petrochemical industries ?
11. Comment on any one of the biosensor used for environmental monitoring.

12. With any one example, comment on how biotechnology can be used for removing xenobiotics from environment.
13. What are phytoreactors ? Write some applications of it.

(8 × 5 = 40 marks)

Part C

*Answer any **ten** of the following.
Each answer not to exceed a paragraph.*

14. What do you know about biological transformation ? Give an example.
15. Differentiate composting and vermi-composting.
16. What are PCBs ? What is the environmental significance of PCBs ?
17. What are green belts ?
18. What is MPN technique ? What is it used for ?
19. List out some of the most potent earthworms used in vermicomposting.
20. What are GMOs ? Give examples
21. What are bioaerosols ?
22. What are thermo-acidophilic microbes ?
23. What are membrane bioreactors ?
24. What do you understand by the term recalcitrant compounds ?
25. Define xenobiotics with examples.

(10 × 2 = 20 marks)

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Environmental Science

ESW 2C 07—FUNDAMENTALS OF ENVIRONMENTAL ENGINEERING

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Essays)*Answer any two out of the following three questions.*

1. What is noise pollution ? What are its causes and effects ?
2. Write an essay on air pollution control methods.
3. Elaborate the important solid waste treatment methods.

(2 × 10 = 20 marks)

Part B (Short Answers)*Answer any eight out of the following ten questions.*

4. Explain the waste water treatment methods to be employed in dairy industry.
5. Enumerate the important causes and effects of water pollution.
6. Write a brief note on aerobic treatment methods of solid wastes.
7. Discuss the different gaseous air pollution control techniques.
8. Suggest suitable air pollution management measures to be adopted at the end-of-pipeline.
9. Write a brief note on control techniques to check radiation pollution.
10. Briefly describe the processes involved in tertiary treatment of waste water.
11. What is the role of aerobic micro-organisms in the control of water pollution ?
12. Write brief note on landfill remediation.
13. What are the organisms used in biomethanation ? How does it work ?

(8 × 5 = 40 marks)

Turn over

Part C (Very Short Answers)

*Answer any **ten** out of the following twelve questions.*

14. Green Belt.
15. Activated Carbon.
16. Ozone treatment.
17. Biomedical Waste Management Rules, 2016.
18. Gasification.
19. Waste management hierarchy.
20. Venturi Scrubber.
21. MPN.
22. Sludge.
23. Skyglow.
24. MBBR.
25. Non-Biodegradable waste.

(10 × 2 = 20 marks)