

B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31821

Course Code : SH/ENV/301/C-5

Course Title : Ecology and Ecosystem

Instruction to the Examiners.

1. Please set question No.1 using the items A and B from the syllabus.
 2. Three specimens to be set from item A and rest three from item B.
 3. At least one zooplankton to be selected from *rotifers* of item A.
 4. From item B at least one aquatic flora to be selected from *algae*.
 5. Laboratory note book to be properly evaluated based on regularity.
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B.Sc. 3rd Semester (Honours) Examination, 2019-20**ENVIRONMENTAL SCIENCE****Course ID : 31812****Course Code : SH/ENV/302/C-6**

Course Title: Environmental Biotechnology

Time: 1 Hour 15 Minutes**Full Marks: 25***The figures in the margin indicate full marks.*

1. Answer *any five* from the following questions: 1×5=5
- (a) Distinguish between Prokaryotes and Eukaryotes based on genetic material, and membrane bound organelles.
 - (b) Distinguish between euchromatin and heterochromatin.
 - (c) Distinguish between DNA and RNA on the aspects of organization and nucleotide constitution.
 - (d) Write down the central dogma of molecular biology.
 - (e) What do you mean by recombinant DNA technology?
 - (f) Write down four effective steps for waste water treatment.
 - (g) Define biopiles.
 - (h) Write down the scientific names of two PGPR bacteria and their function.
2. Answer *any two* from the following questions: 5×2=10
- (a) Differentiate between bio-insecticides and bio-pesticides. Write down the name of three bio-insecticides and bio-pesticides each commonly used, their application procedure and functions. 2+3=5
 - (b) Define integrated pest control methods. Write down the procedures followed for integrated pest management in developed and developing countries. 2+3=5
 - (c) Write down the chemical components of DNA. Draw the chemical structure of four bases, Deoxyribose sugar and phosphoric acid. Describe how a nucleotide is formed from the said components. 1+3+1=5
 - (d) Distinguish between the B-form and Z-form structures of DNA. RNAs as intermediaries for gene expression are transcribed from DNA, transported out of the nucleus into cytoplasm and used for protein synthesis — Describe the roles performed by different RNAs for protein synthesis. 1+4=5

3. Answer *any one* from the following questions:

10×1=10

- (a) Define aminoacids. How aminoacids are required for protein synthesis *in Vivo* and *in Vitro*? Classify aminoacids on the basis of their neutrality, (+)vely charged, (-)vely charged, hydrophobicity and hydrophilicity. How can you assume a protein to be acid or basic on knowing the aminoacid content? Write down the name of initiator aminoacid and initiator codon sequence for protein synthesis. 1+2+4+2+1=10
- (b) Replication is the prime process for transmission of genetic material from parent to daughter cells, transcription and translation are the major steps for gene expression, describe the functional aspects of each of these process. Describe the fundamental components required and their usage for DNA/gene cloning in recombinant DNA technology. 5+5=10
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20**ENVIRONMENTAL BIOTECHNOLOGY****Course ID : 31822****Course Code : SH/ENV/302/C-6**

Course Title: Environmental Biotechnology

Time: 2 Hours**Full Marks: 15***The figures in the margin indicate full marks.**The questions are of equal value.*

1. Prepare salivary gland chromosomes (through squash) using squash technique on a microscopic slide from gland cells of *Chironomus* larva. Fix the chromosomes with suitable fixative and stain the preparation to observe under microscope. Write down the method of preparation upto the observation under microscope and comment on the result of observation. 1½+1½=3
 2. Identify any mitotic stage using *Alium* root tip cells through squash preparation and staining and then observing under microscope. Write down the method of preparation and observation result to identify the specific stage. 1½+1½=3
 3. (i) Write down the principle of southern blotting and its usefulness.
(ii) What is PCR? Write down the method of performing PCR for a segment of DNA. 1+3=4
 4. Appear for *Viva Voce* whenever asked for by the examiner. 3
 5. Submit the practical Notebook at the beginning of the examination. 2
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B.Sc. 3rd Semester (Honours) Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31813

Course Code : SH/ENV/303/C-7

Course Title: Atmosphere and Global Climate Change (Theory)

Time: 1 Hour 15 Minutes

Full Marks: 25

The figures in the margin indicate full marks.

1. Answer *any five* of the following questions: 1×5=5
- (a) What do you mean by Green house effect?
 - (b) What is smog formation?
 - (c) What is the concept of temperature inversion?
 - (d) Which gases are known as green house gases (GHGs)?
 - (e) Why normal rain water is slightly acidic?
 - (f) Give an idea of Tropical cyclone like 'BUL BUL'.
 - (g) Mention the main objectives of Montreal Protocol.
 - (h) What is Chapman cycle?
2. Answer *any two* of the following questions: 5×2=10
- (a) Give a brief idea of the structure and function of Indian monsoon and its development. 5
 - (b) Discuss the various meteorological Parameters briefly. 5
 - (c) Write about the formation of different atmospheric particles including gases. 5
 - (d) Point out the principles of convention on climate change. 5
3. Answer *any one* of the following questions: 10×1=10
- (a) Discuss about the Ozone Layer depletion, its causes and negative impact on environment and Public health.
 - (b) Illustrate and sketch the atmospheric layers and discuss on it's composition.
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B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31823

Course Code : SH/ENV/303/C-7 (P)

Course Title: Atmosphere and Global Climate Change

Time: 2 Hours

Full Marks: 15

The figures in the margin indicate full marks.

1. Submit a Project report or Term-paper on Global Warming/Ozone layer depletion/any Global crisis/Catastrophic changes. 10
 2. Viva Voce 5
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B.Sc. 3rd Semester (Honours) Examination, 2019-20**ENVIRONMENTAL SCIENCE****Course ID : 31815****Course Code : SH/ENV/305/SEC-1**

Course Title: Remote Sensing, Geographic Information System
and Modeling

Time: 1 Hour 15 Minutes**Full Marks: 25***The figures in the margin indicate full marks.*

1. Answer any *five* questions: 1×5=5
 - (a) What is EMS?
 - (b) What is network analysis in GIS?
 - (c) Define spatial resolution.
 - (d) What is IFOV?
 - (e) What is vector data structure?
 - (f) Among the three measures of central tendency, which is most sensitive?
 - (g) What is simple random sampling?
 - (h) What do you mean by Linear regression?

2. Answer *any two* questions: 5×2=10
 - (a) What is GIS? Briefly describe the different key components of GIS? 1+4
 - (b) Answer *any two* from the given below: 2·5×2
 - (i) Data manipulation
 - (ii) Spectral signature
 - (iii) LANDSAT
 - (c) Define Sun-synchronous satellite. What are the major application of these satellite? 1+4
 - (d) Discuss about different types sensors used in the remote sensing.

3. Answer any *one* question: 10×1=10
 - (a) Describe how remote sensing and GIS techniques are used for natural resource management.
 - (b) How can one apply the best use of remote sensing and GIS technology as a tool for land use and land cover mapping?

B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31825

Course Code : SH/ENV/305/SEC-1

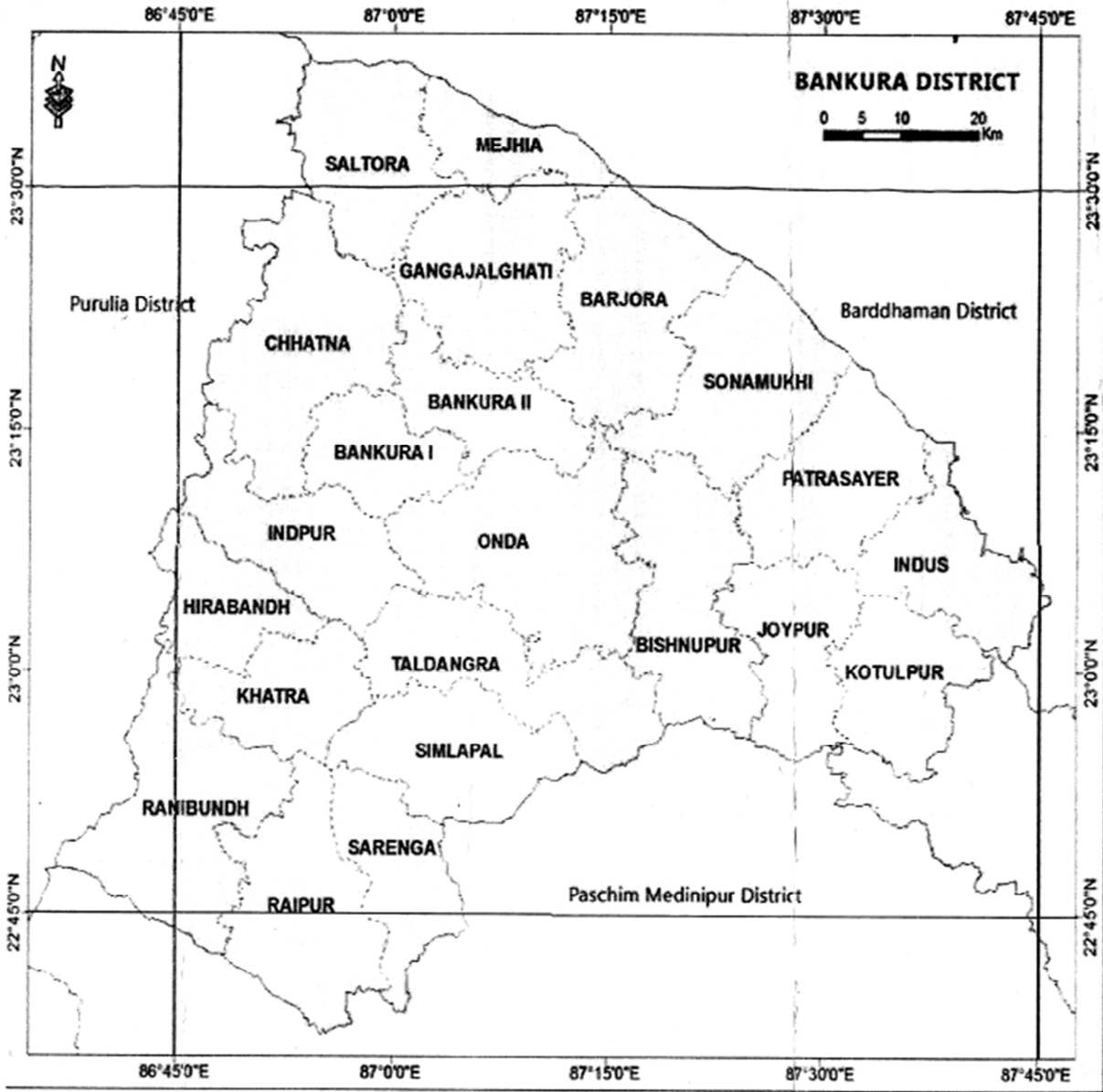
**Course Title: Remote Sensing, Geographic Information System
and Modeling**

Time: 2 Hours

Full Marks: 15

The figures in the margin indicate full marks.

- | | |
|---|--------|
| 1. Georeference the given map. Add 2 vector layers to it (2 lines, 1 polygon) | 3+7=10 |
| 2. Practical Note Book | 2 |
| 3. Viva Voce | 3 |
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SP-III/ENV/301/C-1C/19

B.Sc. 3rd Semester (Programme) Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31818

Course Code : SP/ENV/301/C-1C

Course Title: Gender and Environment

Time: 1 Hour 15 Minutes

Full Marks: 25

The figures in the right hand side margin indicate marks.

দক্ষিণ প্রান্তস্থ সংখ্যাগুলি প্রশ্নের পূর্ণমানের নির্দেশক।

1. Answer *any five* of the following:

1×5=5

যে কোনো পাঁচটি প্রশ্নের উত্তর দাওঃ

(a) When was the term 'Sustainable Development' came into existence?

'Sustainable Development' শব্দটি কবে প্রথম প্রচলন হয়?

(b) What is 'Biological Hot Spot'?

'Biological Hot Spot' কী?

(c) What is matriarchy?

Matriarchy কী?

(d) What is meant by 'Environmental movement'?

'পরিবেশ আন্দোলন বলতে কী বোঝ?

(e) Name two renewable natural resources.

দুটি পুনঃনবীকরণযোগ্য প্রাকৃতিক সম্পদের নাম লেখ।

(f) Name the woman Activist in Narmada Banchao Aandolan.

নর্মদা বাঁচাও আন্দোলনের প্রধান মহিলা নেতৃত্বের নাম লেখ।

(g) World Women's Day is celebrated in which day?

আন্তর্জাতিক নারী দিবস কবে পালিত হয়?

(h) What is the Full form of WEDO?

WEDO এর পুরো নাম কী?

2. Answer any two of the following:

5×2=10

যে কোনো দুটি প্রশ্নের উত্তর দাওঃ

(a) What is population explosion? Write its effect.

1+4

জনবিস্ফোরণ কী? এর প্রভাব লেখ।

(b) What is Red Data Book? Write the main objectives of it.

1+4

Red Data Book কী? এর মূল উদ্দেশ্যগুলি লেখ।

(c) What is green house effect? Name two green house Gases and mention their impacts on it.

1+4

Green House effect কী? দুটি Green House gas এর নাম লেখ এবং তাদের প্রভাব আলোচনা কর।

(d) What is Sustainable Development? Why Sustainable Development is useful for people on earth?

1+4

স্থিতিশীল উন্নয়ন কী? পৃথিবীর মানুষদের জন্য স্থিতিশীল উন্নয়নের প্রয়োজনীয়তা কী?

3. Answer any one of the following:

10×1=10

যে কোনো একটি প্রশ্নের উত্তর দাওঃ

(a) What are the main issues of Environmental Movements? Discuss the women's participation in environmental movements.

3+70

পরিবেশ আন্দোলনের মূল কারণগুলি কী? পরিবেশ আন্দোলনে মহিলাদের ভূমিকা সম্পর্কে যা জানো লেখ।

(b) Define Resource. Discuss the role of ICT in resource management and conservation.

2+8

সম্পদের সংজ্ঞা দাও। Resource Management এবং সংরক্ষণে ICT এর গুরুত্ব কী?

B.Sc. 3rd Semester (Programme) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31828

Course Code : SP/ENV/301/C-1C

Course Title: Gender and Environment

Time: 2 Hours

Full Marks: 15

The figures in the margin indicate full marks.

1. Submit a Project report or Term paper on environmental management or any global crisis. 10
 2. Viva Voce 5
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SP-III/ENV/304/SEC-1/19

B.Sc. 3rd Semester (Programme) Examination, 2019-20**ENVIRONMENTAL SCIENCE****Course ID : 31810****Course Code : SP/ENV/304/SEC-1****Course Title: Remote Sensing, Geographic Information System
and Modelling****Time: 1 Hour 15 Minutes****Full Marks: 25**

*The figures in the margin indicate full marks.
Candidates are required to give their answers in
their own words as far as practicable.*

*দক্ষিণ প্রান্তস্থ সংখ্যাগুলি প্রশ্নের পূর্ণমানের নির্দেশক।
পরীক্ষার্থীদের যথাসম্ভব নিজের ভাষায় উত্তর দিতে হবে।*

Section-A**1. Answer any five questions by filling the blanks:****1×5=5**

যে কোনো পাঁচটি প্রশ্নের শূন্যস্থান পূর্ণ করোঃ

- (a) The full form of EMR is _____.
EMR-এর পুরো কথাটি হল _____।
- (b) Water completely absorbs _____ wavelength in the EMR.
EMR-এর যে তরঙ্গ দৈর্ঘ্য, জল সম্পূর্ণরূপে শোষণ করে সেটি হল _____ তরঙ্গ দৈর্ঘ্য।
- (c) Forest appears _____ in colour in a false colour composite (FCC) image.
FCC চিত্রে জঙ্গলকে _____ রং-এ দেখা যায়।
- (d) Passive remote sensing uses _____ energy in order to capture images.
চিত্র সংগ্রহ করার জন্য নিষ্ক্রিয় দূর সংবেদন _____ শক্তি (energy) ব্যবহার করে।
- (e) GPS is used for the purpose of _____.
GPS ব্যবহারের উদ্দেশ্য হল _____।
- (f) _____ data is a discrete data format.
_____ হল একটি discrete data format.
- (g) Georeferencing is done in order to provide _____ in scanned maps.
Georeferencing করা হয় কোন scanned মানচিত্রকে _____ দেবার জন্য।
- (h) Non-spatial data is also known as _____ data.
অ-দৈশিক তথ্য (Non-spatial data) কে _____ তথ্যও বলা হয়।

Section-B

2. Answer any two questions:

5×2=10

যে কোনো দুটি প্রশ্নের উত্তর দাও :

(a) What are the advantages and disadvantages of aerial photographs in comparison to satellite images.

উপগ্রহ চিত্রের তুলনায় বিমান চিত্রের যে যে সুবিধা ও অসুবিধাগুলি আছে তা আলোচনা কর।

(b) What are the different types of Remote Sensing Platforms and what are their broad uses?

দূর সংবেদনের প্ল্যাটফর্মের (Remote Sensing Platforms) শ্রেণিবিভাগ কর এবং তাদের প্রধান ব্যবহারগুলি উল্লেখ কর।

(c) Describe the different components of a Geographical Information System.

Geographical Information System এর বিভিন্ন উপাদান গুলি (components) কী কী?

(d) In what ways remote sensing and GIS can be applicable in solving problems related to water resource management and agricultural problems.

জলসম্পদ ব্যবস্থাপনা এবং কৃষিক্ষেত্রে নানা সমস্যা সমাধানে দূর সংবেদন ও GIS কিভাবে ব্যবহৃত হতে পারে?

Section-C

3. Answer any one question:

10×1=10

যে কোনো একটি প্রশ্নের উত্তর দাও :

(a) From the given data compute the Regression Equation and Co-relation Co-efficient: 10

প্রদত্ত তথ্যের সাহায্যে Regression Equation ও Co-relation Co-efficient নির্ণয় কর :

Infant ID	Gestational Age (weeks)	Birth weight (grams)
1	34.7	1895
2	36.0	2030
3	29.3	1440
4	40.1	2835
5	35.7	3090
6	42.4	3827
7	40.3	3260
8	37.3	2690
9	40.9	3285
10	38.3	2920

(b) Explain the process of capturing, processing analysing and using a satellite images in order to study land use land cover changes of a region.

উপগ্রহ চিত্রের সংগ্রহ, প্রক্রিয়াকরণ, বিশ্লেষণ ও ব্যবহার কোনো অঞ্চলের ভূমির ব্যবহারের পরিবর্তন কীভাবে হচ্ছে জানতে সাহায্য করে। এর প্রত্যেকটি পদক্ষেপ বর্ণনা কর।

SP-III/ENV/304/SEC-1(PR)/19

B.Sc. 3rd Semester (Programme) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31820

Course Code : SP/ENV/304/SEC-1

**Course Title: Remote Sensing, Geographic Information System
and Modelling (Practical)**

Time: 2 Hours

Full Marks: 15

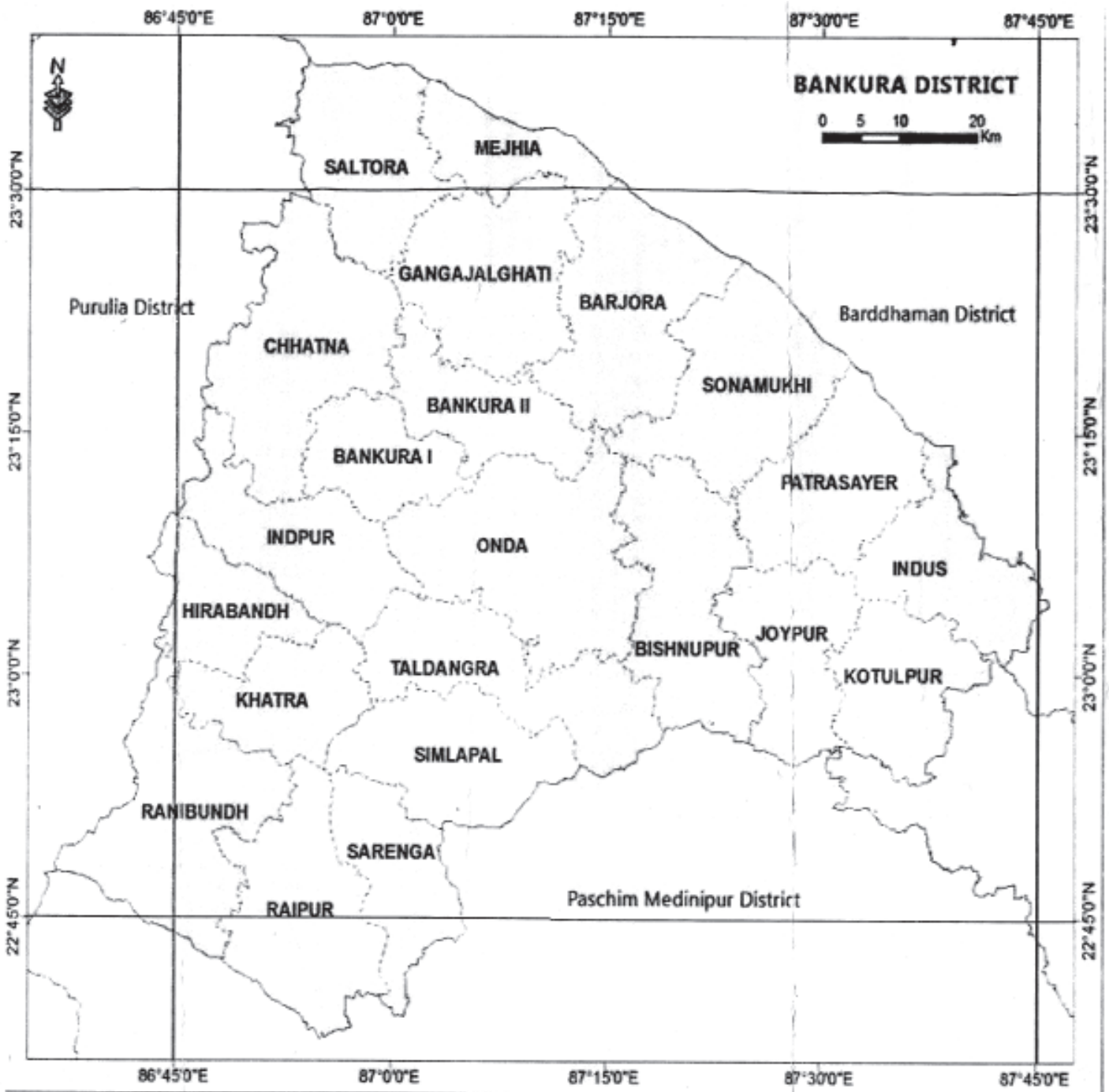
*The figures in the margin indicate full marks.
Candidates are required to give their answers in
their own words as far as practicable.*

*দক্ষিণ প্রান্তস্থ সংখ্যাগুলি প্রশ্নের পূর্ণমানের নির্দেশক।
পরীক্ষার্থীদের যথাসম্ভব নিজের ভাষায় উত্তর দিতে হবে।*

Answer the following questions:

প্রশ্নগুলির উত্তর দাও :

1. Given is the block map of Bankura district. Georeference the given map. Digitize the block boundaries and prepare a layout of the administrative map. Export the layout in .pdf format using QGIS software or the software provided to you. 2+5+2+1=10
বাঁকুড়া জেলার ব্লক মানচিত্র দেওয়া হয়েছে। এই মানচিত্রটিকে Georeference করো। ব্লক সীমানা বরাবর Digitize করে একটি প্রশাসনিক মানচিত্রের layout তৈরি করে .pdf-এ পরিবর্তিত করো QGIS বা প্রদত্ত software-এর মাধ্যমে।
2. Laboratory Notebook 2
প্রয়োগশালার খাতা
3. Viva Voce 3
মৌখিক প্রশ্নাবলী



SP-III/ENV/304/SEC-1(PRI)/19

B.Sc. 3rd Semester (Programme) Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31820

Course Code : SP/ENV/304/SEC-1

Course Title: Remote Sensing, Geographic Information System
and Modelling (Practical)

Instructions to the Examination Centre.

Provide with the question paper is a hard copy of block map of Bankura district. You are requested to scan this given map in .jpg format and provide the scanned image to the students for georeference.

B.Sc. 3rd Semester (Honours) Examination, 2019-20**ENVIRONMENTAL SCIENCE****Course ID : 31811****Course Code : SH/ENV/301/C-5**

Course Title: Ecology and Ecosystem

Time: 1 Hour 15 Minutes**Full Marks: 25***The figures in the margin indicate full marks.*

1. Answer *any five* from the following questions: 1×5=5
- Define ecology and distinguish between autecology and synecology.
 - Briefly explain Liebig's law of minimum.
 - Distinguish between ecotone and ecocline with example.
 - Define species, population and community.
 - Define physiognomy with example.
 - What is meant by Keystone species, give example of two Keystone species?
 - What do you mean by biogeochemical cycles and nutrient cycling?
 - 'Exotic species is harmless whereas invasive species is harmful to the ecosystem' – explain.
2. Answer *any two* questions: 5×2=10
- Define Biome. Write down the names of major terrestrial biomes and their distinctiveness. Briefly explain the application of the law of tolerance in a specific biome. 1+2½+1½=5
 - Explain r – and k- selection strategies in brief. Define natality and mortality and life tables. 2+1+1+1=5
 - What do you mean by ecological succession? Explain climax community in brief. 2+3=5
 - What are the principle components of an ecosystem? 'Primary producers are the chief regulators for subsequent energy flow through the ecosystem' – explain. Distinguish between food chain and food web. 1½+2½+1=5
3. Answer *any two* questions: 10×1=10
- Explain energy flow through a typical ecosystem using universal energy flow model. What do you mean by ecological efficiencies? Explain ecological pyramids using biomass. 6+3+1=10
 - Water content on the earth is constant – explain. Explain on the models of nutrient cycling. 5+5=10

B.Sc. 3rd Semester (Honours) Practical Examination, 2019-20

ENVIRONMENTAL SCIENCE

Course ID : 31821

Course Code : SH/ENV/301/C-5

Course Title: Ecology and Ecosystem

Time: 2 Hours

Full Marks: 15

The figures in the margin indicate full marks.

1. Identify the following specimens to be provided for identification with appropriate observation tool, with reason for their grouping into either fauna/zooplankton or phytoplankton/flora and also to their inclusion into respective phylum. Altogether 6 specimens are to be identified as in the following identification mark. 6×1½=9
(a) (b) (c)
(d) (e) (f)
 2. Draw survivorship curves with respect to fishes or primates. 2
 3. Appear for *viva voce* as per the direction from the concerned examiners. 2
 4. Submit your laboratory note book in the beginning of examination. 2
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