

大学院入学試験問題用紙

2024 年度 1 期

科 目 名	受 験 専 攻	受 験 番 号	氏 名
広域環境情報学	農業工学 専攻 博士後期 課程		
I. 衛星画像データを用いた植生環境モニタリング研究の過去 10 年間の発展動向について, 引用文献をあげながら解説せよ.			
II.. 画像解析に用いられる機械学習・深層学習について, 1 つの手法を取り上げ, A) その原理について解説するとともに, B) 自身の研究への応用例を説明せよ.			

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2024 年度 I 期

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水利施設工学	農業工学専攻 博士後期課程		

次の 2 つの問いについて解答しなさい。

問 1 マニング公式で用いられる粗度係数と摩擦損失係数との関係を説明しなさい。

問 2 水田における水管理について説明するとともに、水田における水質浄化（水質汚濁）、温室効果ガスを抑制するための水管理手法について述べなさい。

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2024 年度 2 期

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英語 English	農業工学 専攻 博士後期 課程		

I. Select the appropriate word in the options below to fill in the brackets. Write your answers in the space below.

A) The three states of water are ice as a solid, water as a liquid, and water vapor as a gas. When the temperature is [i] under a certain pressure, the water changes from ice to water and from water to water vapor. The former change is called [ii] and the latter change is called [iii].

B)
(Source: Oxford Dictionary, application version, Ver.15.4.1064.1064, MobiSystem, Inc., 2024)

C) Bernoulli's theorem is the theorem that energy is conserved along a single [vi] in the [vii] flow of a perfect fluid, i.e., a fluid that is not [viii]. Expressed simply in terms of hydraulic head, meaning energy per unit [ix], we can say that the sum of velocity, [x], and position hydraulic head is constant everywhere.

<options> condensation / decreased / evaporation / force / increased / melting / opposite / pressure / rapid / shaking / smooth / solid / steady / streamline / uniform / velocity / viscous / volcanic / volume / weight

Your answer: (i) _____ (ii) _____ (iii) _____

(iv) _____ (v) _____ (vi) _____ (vii) _____

(viii) _____ (ix) _____ (x) _____

II. Fill in the most appropriate word in the brackets. Write your answers in the space below.

A)
(Source: Oxford Dictionary, application version, Ver.15.4.1064.1064, MobiSystem, Inc., 2024)

B)
(Source: Oxford Dictionary, application version, Ver.15.4.1064.1064, MobiSystem, Inc., 2024)

C) Modern agriculture generally refers to agriculture that aims to increase [iv] through the massive use of chemical [v] and pesticides, large-scale production, and [vi].

D) [vii] Information System, or GIS for short, is a technology that comprehensively manages, processes, and visually displays data with location-related information ([viii] data) using geographic location as a clue(*), enabling advanced analysis and rapid decision making.

Your answer: (i) _____ (ii) _____ (iii) _____

(iv) _____ (v) _____ (vi) _____ (vii) _____

(viii) _____

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III. Read the following text and answer the questions.



(Source: Ecology A Pocket Guide, Earnest Callenbach, University California Press, 1998)

Question 1. What four words does the underlined part (1) replace in the text?

Your Answer: _____

Question 2. What and what is stated as the energy source required for cellular metabolism.

Your answer: _____ and _____

Question 3. Complete the sentence by rearranging the following words. Answer with alphabetic symbol.

The author states that nuclear power _____ .
(a) because (b) commercially (c) of (d) public (e) support (f) viable

Question 4. How was energy defined until a few decades ago?

_____ the _____

Question5. What are the two properties of subatomic particles? Answer each in one word.

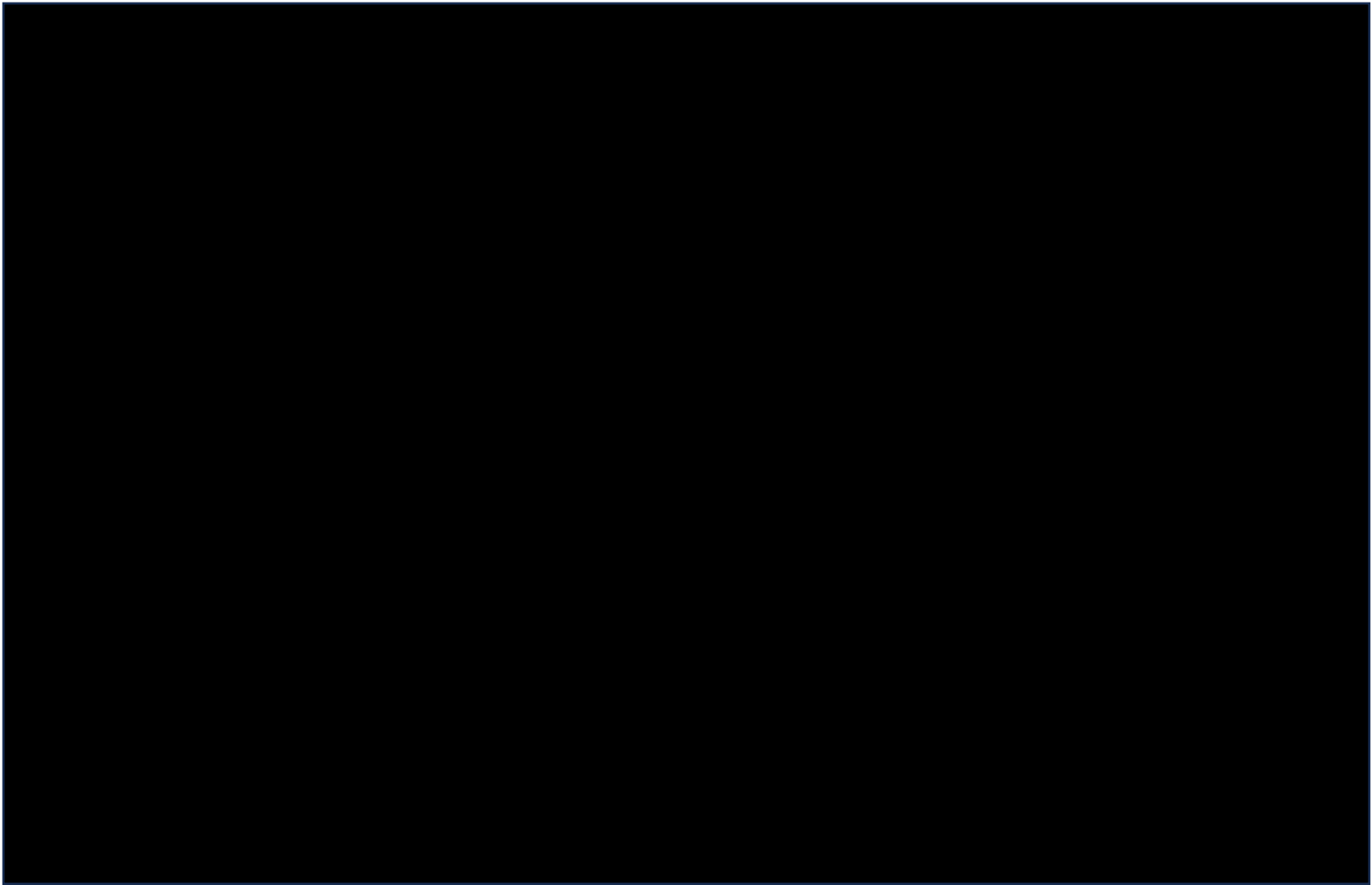
Your answer: _____ , _____

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IV. Choose the appropriate word or phrase from the options A to J in the following sentence. However, the options must not be used in duplicate.
次の文章のなかにあるAからJに入る適切な語句を選択肢より選べ。ただし、選択肢は重複して使用してはならない。



Source: FAO. 2021.Synergies and trade-offs in climate-smart agriculture – An approach to systematic assessment. Rome.
<https://doi.org/10.4060/cb5243en>, ISBN 978-92-5-134592-4 © FAO, 2021

<Options>
country, environment, greenhouse gas, increasing, methodologies, mitigation, resilience, synergies, systematic, trade-offs

Your answers

A:	B:	C:	D:
E:	F:	G:	H:
I:	J:		

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広域環境情報学 Regional Environmental Informatics	農業工学 専攻 博士後期 課程		

I . Describe the methods for deriving land cover maps by using UAV or satellite imagery.

II . Elaborate on the spectral characteristics of NDVI, and then introduce an alternative index besides NDVI. Describe the assigned wavelength bands and discuss their possibilities in capturing information.

III . Assume you want to analyze the impact of agricultural land on climate change in a watershed. How would you approach this analysis? Specify the crop vegetation and the target area and then propose on the objective and the methodology for this study project.