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Question Paper Code: U2P07

B.E./B.Tech. DEGREE EXAMINATION, MAY 2024

Second Semester

Agriculture Engineering

21UPH207- Physics For Agriculture

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. If the binding energy per nucleon of deuteron is 1.115 MeV. Its mass defect in atomic mass unit is CO3- App
(a) 0.0048 (b) 0.0024 (c) 0.0012 (d) 0.0006
2. A radioactive decay can form an isotope of the original nucleus with the emission of particles CO6-Ana
(a) 1α and 4β (b) 1α and 2β (c) 1α and 1β (d) 4α and 1β
3. The total surface area of nano cubes of volume 1 nm^3 each in a total volume 1 cm^3 CO1-U
(a) 6 cm^2 (b) 6000 cm^2 (c) $600,000\text{ cm}^2$ (d) $60,000,000\text{ cm}^2$
4. The colour of the nano gold particles is _____ CO2-U
(a) Yellow (b) Orange (c) Red (d) Variable
5. Which of the following soil type is loosely packed with large air spaces CO2-U
(a) Sandy soil (b) Clay soil (c) Loamy soil (d) None of these
6. Breaking down of rocks by the action of wind and climate is called CO2-U
(a) Weathering (b) Oil vegetation (c) Cultivating (d) percolation
7. In Raman spectroscopy, the radiation lies in the _____ CO2-U
(a) Microwave region (b) visible region (c) IR region (d) X-ray region
8. The units of absorbance CO2-U
(a) L mol^{-1} (b) L mol (c) $\text{mol}^{-1}\text{ cm}^{-1}$ (d) None of the above

9. The changes in the reflectivity/emissivity with time, is called: CO2-U
 (a) Spectral variation (b) Spatial variation (c) Temporal variation (d) None of these
10. A reduction of nitrogen nutrient in plants: CO2-U
 (a) Affects leaf color (b) Reduces pigment concentration
 (c) Increase the visible reflectivity (d) All of these

PART – B (5 x 2= 10Marks)

11. What are the properties of nuclear force CO1-U
12. What do you understand by quantum confinement in a nanomaterial CO1-U
13. Explain the term soil topography. CO2-U
14. What is spectrophotometer? CO1-U
15. Define Spectral signature CO2-U

PART – C (5 x 16= 80Marks)

16. (a) Obtain the expression for mean life time in terms of its decay constant and half life time CO1-U (16)
 Or
 (b) Explain what you understand by nuclear fission. Describe the necessary condition to bring about fission process CO1-U (16)
17. (a) Explain Top-down and Bottom up synthesis for producing nano materials CO2-U (16)
 Or
 (b) Discuss the structure, properties of carbon nano tubes and its applications CO2-U (16)
18. (a) What is soil structure? Describe the different types of soil structure. Write the role of soil structure relation to plant growth. CO2-U (16)
 Or
 (b) Explain factors affecting soil temperature. CO2-U (16)
19. (a) Write a note on following CO2-U (16)
 (i) Vibrational Raman Spectra
 (ii) Rotational Raman Spectra
 (iii) Lamberts law

Or

- (b) With Neat diagram explain in detail principle and working of fluorescence spectroscopy CO2-U (16)
20. (a) What is electromagnetic spectrum? Explain production and properties of electromagnetic radiation with a neat sketch CO5-U (16)
- Or
- (b) What is Remote sensing and explain the components of real Remote sensing System CO5-U (16)

