A   **Reg. No. :**

B.E./B.Tech. DEGREE EXAMINATION, MAY 2022

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   CO3- App
   defect in atomic mass unit is

   (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   CO6-Ana
   emission of particles
   (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   CO1-U
   volume 1 cm^3

   (a) 6 cm^2 (b) 6000 cm^2 (c) $600,000$ cm^2 (d) $60,000,000$ 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) mol^{-1} 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 CO1-U (16)
constant and half life time

                         Or

    (b) Explain what you understand by nuclear fission. Describe the   CO1-U (16)
necessary condition to bring about fission process

17. (a) Explain Top-down and Bottom up synthesis for producing nano CO2-U (16)
materials

                         Or

    (b) Discuss the structure, properties of carbon nano tubes and its CO2-U (16)
applications

18. (a) What is soil structure? Describe the different types of soil structure. CO2-U (16)
Write the role of soil structure relation to plant growth.

                         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)

<div align="center">Or</div>

(b) What is Remote sensing and explain the components of real Remote sensing System   CO5-U   (16)

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