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SVS 329 B-2K12

B.Sc. Vth Semester Degree Examination

Physics Optional

Quantum Mechanics, Nuclear Physics and Energy Physics

Paper - 5.2 (VI)

Time : 3 Hours Maximum Marks : 80

Instructions to Candidates

*Answer **all** the questions from Section **A**, any **five** from Section **B** and any four from Section **C**.*

Section - A

I Answer the following in one or two sentences. **(15×1=15)**

1) What is compton-effect.
2) What is Zero-point-energy.
3) Write de-Broglie wavelength formula.
4) What is degeneracy
5) What is wave function.
6) State proton-neutron hypothesis.
7) Name unit used to express Nuclear radius.
8) Define Curie.
9) What is neutrino
10) Write cyclotron-condition.
11) Write an advantage of scintillation-counter
12) What is Boson
13) What is principle of Hydrogen-Bomb
14) State decay law
15) Give an example of Renewable energy

Section - B

16) Explain J.P. Thomson experiment. **(5×5=25)**
17) Obtain equation for energy levels for rigid rotator.

18) Explain briefly Liquid-drop-model

19) Write a note on gamma-absorption

20) Write a note on Elementary Particles

21) Compare conventional and Non-conventional energies

22) Explain Nuclear-fission-chain reaction

Section - C

23) a) State and explain Heisenbergs uncertainty principle
    b) Illustrate the uncertainty Principle by gamma-ray-microscope.
    c) Calculate the Momentum of particle associated with wavelength 1AO **(4+4+2)**

24) a) Describe Davison and Germer experiment
    b) Derive time-Independent schrodingers equation. **(6+4)**

25) a) Explain Nuclear Forces
    b) Explain Binding Energy curve.
    c) Calculate Nuclear radius of Berillyam - 8 (Be-8) **(5+4+1)**

26) a) What is radio-equilibrium
    b) Explain Transient, Secular Equilibriums
    c) State Geiger, Geiger-Nuttal law
    d) Calculate decay constant of Radium of half-life 1600 years **(1+6+2+1)**

27) a) Write briefly note on principle construction working of Betatron
    b) Write briefly Note on principle construction working of Geiger Muller Counter (GMC) **(5+5)**

28) a) Explain Carbon - Nitrogen cycle write its Importance
    b) Explain briefly any one Non-conventional-energy. **(5+5)**
