QP CODE: 18103331

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Reg No : .....

Name : .....

B.Sc. DEGREE (CBCS) EXAMINATION, NOVEMBER 2018

Third Semester

B.Sc Chemistry Model I

COMPLEMENTARY COURSE - PH3CMT02 - PHYSICS - MODERN PHYSICS AND MAGNETISM

(Common to B.Sc Chemistry Model I, B.Sc Geology Model I)

2017 Admission Onwards

0F5D9BB1

Maximum Marks: 60 **Time: 3 Hours**

Part A

Answer any **ten** questions.

Each question carries **1** mark.

1. How can Paschen series be formed in a Hydrogen spectrum.
2. What do you mean by magnetic orbital quantum number?
3. Explain the term Bohr magneton.
4. What are the consequence of uncertainty principle
5. Write down the rules obeyed while considering intensity of spectral line.
6. Mention the condition for the occurance of pure rotational spectrum of diatomic molecule?
7. What are the features of Raman effect?
8. What is Avalanche breakdown?
9. What is the efficiency of a half wave rectifier?
10. Why a transistor is called a current controlled device
11. What are ferromagnetic domains?
12. Define the terms a) Isoclinic B) isogonic lines.

(10×1=10)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. The binding energy per nucleon for two isotopes of carbon ^{12}C and ^{13}C are 7.68MeV and 7.47MeV respectively. What is the energy required to remove a neutron from the carbon nucleus.
14. A radioactive substance undergoes disintegration at the rate of 5000 and 4000 disintegrations per minute at the 4^{th} and 6^{th} hour respectively. Calculate the half-life of the substance.

15. Find the de Broglie wavelength of an electron accelerated to a potential difference of 100 Volt .

16. If the wave function $\psi(x) = A \sin kT$ satisfies the time – independent Schrodinger equation . Find the form of the potential V(x).

17. What is the probability of finding the particle in between 0.4 L and 0.6 L in a one-dimensional box of length L.

18. A potential barrier of 0.50 V exists across a p-n junction. (a) If the depletion region is 5.0×10^{-7} m wide, what is the intensity of the electric field in this region? (b) An electron with speed 5.0×10^{5} ms^{-1} approaches the p-n junction from the n-side, with what speed will it enter the p-side?

19. How does a zener diode work as avoltage regulator ?

20. What are the advantages of a full wave bridge rectifier over that of a centre tap full wave rectifier.

21. Classify and explain magnetic materials on the basis of susceptibility.

(6×5=30)

Part C

Answer any **two** questions.

Each question carries **10** marks.

22. Derive the equation for radioactive decay. What do you mean by half-life and mean life of radioactive substance? Obtain the relation connecting disintegration constant, mean life and half-life of a radioactive substance.

23. Discuss NMR spectroscopy.

24. With a neat diagram describe the action of a full wave bridge rectifier. Compare its merits over that of centre tap full wave rectifier.

25. Discuss about earth's magnetism and with help of diagram, explain the components of earth's magnetic fields

(2×10=20)