

GANDHI P.R. COLLEGE BHOPAL

M SC III SEMESTER PHYSICS EXAM- 2020-21

CONDENSED MATTER PHYSICS - I

PAPER- I

- Q.1 Define lattice and explain its types.**
- Q.2 Deduce Bragg 'law for the x- rays diffraction. Describe bragg's x-ray spectrometer and explain how it is used for the study of crystal structure?**
- Q.3 Explain elastic compliance and reduction of number of elastic constant.**
- Q.4 explain inelastic scattering of phonons by phonos.**
- Q.5 Explain qualitatively the effect of high magnetic field on the allowed states for electrons in reciprocal space. What is de- Hass van alphen effect?**

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NUCLEAR AND PARTICLE PHYSICS

PAPER- II

- Q.1 EXPLAIN OR, NOT, NAND, NOR, EX, - OR AND EX-NOR gates with the help of logic symbols and truth table.**
- Q.2 what are half- subtractor and full subtractor? Draw truth table and develop logic circuits for them and explain their working.**
- Q.3 Explain the principle, construction working and limitation of cyclotron.**
- Q.4 Write assumptions of the Fermi theory of β decay and establish relation for the matrix elements of interaction (HIF)**
- Q.5 Explain all types of the nuclear interactions present among elementary particles.**

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DIGITAL ELECTRONICS

PAPER- III

- Q.1 What is 1's & 2's complement. Explain with suitable example.**
- Q.2 Write about universal gate and exclusive gate with logical diagram and truth table.**
- Q.3 Explain the multiplexer draw logical circuit and truth table**
- Q.4 Distinguish between asynchronous counter and synchronous counter.**
- Q.5 Write short notes on the following**
- I) successive approximation ADC**
 - II) DAC structure**

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ATOMIC AND MOLECULAR PHYSICS

PAPER- IV

- Q.1 Explain interaction between nuclear and magnetic field.**
- Q.2 Write notes on the following:**
- a) Pre- dissociation**
 - b) Born- Oppenheimer Approximation**
- Q.3 Explain the Raman Effect by classical theory and hence describe the experiment to study it.**
- Q.4 Explain the basic principle of Mossbauer spectroscopy.**
- Q.5 What do you understand by splitting of electron energy levels by a magnetic field? Discuss the hyperfine structure of ESR absorption.**