QP CODE: 24803819

24803819

Reg No : .....

Name : .....

INTEGRATED MSC DEGREE EXAMINATION, JULY 2024

Fourth Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

COMPLEMENTARY - ICH4CM05 - PHYSICS IV - OPTICS, DIELECTRICS AND SPECTROSCOPIC INSTRUMENTATION

2020 Admission Onwards

3AA0FAD1

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Write two properties of Coherent sources
2. State two properties of interference pattern
3. Breifly explain the condition for Destructive interference.
4. Distinguish between disperive power and resolving power of an optical element.
5. Breifly explain the functions of optical resonator.
6. Draw the schematic representing three level pumping scheme in Ruby laser.
7. What is graded index fiber ? Give its refractive index profile.
8. What is polar molecule ? Give one example.
9. Point out the criteria for a substance to have UV/Visible absorbance.
10. Draw the schematic of experimental setup for demonstration of raman effect.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Explain how Circular Newton’s rings are formed by reflected light.
12. Give the theory of plane tarnsmission grating.
13. State and explain Brewsters law with neat diagrom.

14. Explain the phenomenon of double refraction.

15. Write a short note on properties of LASER light.

16. A glass fiber is made with core of refractive index 1.55 and cladding is dopped to give a fractional difference of 0.005. Find refractive index of cladding .

17. Explain electric polarisation of matter.

18. Explain X ray diffraction methods.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Explain interference in thin films due to reflected light and derive the condition for constructive interference

20. Explain working of Ruby laser and He-Ne laser

21. Derive the expression for electronic polarizability and establish the frequency dependence

22. What is infrared spectroscopy? Explain the uses of FTIR.

(2×5=10 weightage)