BANKIM SARDAR COLLEGE

Part – II (1+1+1) Examination 2020

B.Sc. (Honours)

Subject: ……

Paper: III+IV

Group: (1+2)

Time: 2 Hours **Full Marks: 25+25 = 50**

(Answer each Group in separate Answer-Sheets)

Group 1

Answer any TWO Questions from Question 1 to 4. 2x5=10

1. What is negative feedback? What are its advantages?
2. What are the properties of ideal op amp? What is CMRR?
3. State Biot Savart's law. What is magnetic vector potential?
4. State Faaraday's law of electromagnetism? Define self inductance.
5. Answer any one question 2.5

i) What is the difference of RS and JK flip flop?

ii) What is Ampere's Circuital law?

Answer any TWO Questions from Question 6 to 9. 2x5=10

6. State Gauss's law of electrostatics. Derive Poisson's equation from it.
7. State the boundary conditions at the interface of two dielectrics.
8. State the condition necessary for interference. How is it satisfied in the Fresnel biprism set up.
9. Name the two classes of diffraction. Cite examples of the two classes.
10. Answer any one question 2.5

i) What do you mean by electrical image?

ii) What is polarization?

Group 2

Answer any TWO Questions from Question 11 to 14. 2x5=10

11. State Planck's law of blackbody radiation. What is de Broglie hypothesis?
12. State Heisenberg's uncertainty principle. What is a Hermitian operator?
13. What is a state function? What is a quasistatic process?
14. State the second law of thermodynamics?
15. Answer any one question 2.5

i) Calculate $[\widehat{x}, \widehat{p_x}]$

ii) What are Maxwell's relation of thermodynamics?

16. What is resonance? What type of resonance occurs is series LCR circuit? What is the value of the impedance of series LCR circuit? What is the resonance frequency of the series LCR circuit. What is the Q factor of the circuit? (3+2+3+2+2.5=12.5)