



Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code : X 10949**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
AND APRIL/MAY 2021

Second Semester

Computer and Communication Engineering

PH 8253 – PHYSICS FOR ELECTRONICS ENGINEERING

(Common to Biomedical Engineering/Electrical and Electronics Engineering/  
Electronics and Communication Engineering/Electronics and Instrumentation  
Engineering/Electronics and Telecommunication Engineering/Instrumentation  
and control Engineering/Medical Electronics)

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. Define Fermi level and Fermi energy with its importance.
2. What is a periodic potential ?
3. Define donors and acceptors.
4. The Hall Co-efficient of a specimen of doped silicon is found to be  $3.66 \times 10^{-4} \text{ m}^{-3}/\text{C}$ . The resistivity of specimen is  $8.93 \times 10^{-3} \Omega \text{ m}$ . Find the mobility and density of charge carriers.
5. Define the term retentivity and coercivity and its units.
6. What is meant by high-k-dielectrics ?
7. What are optical materials ? Give its types.
8. Specify the types of photo detector.
9. Recall the term Bloch oscillations.
10. Define Coulomb blockade effect.



PART – B

(5×16=80 Marks)

11. a) Derive an expression for the density of states and based on that calculate the carrier concentration in metals.  
(OR)
- b) Derive an expression for both electrical conductivity and thermal conductivity of electrons in metal. Hence deduce Wiedemann – Franz Law.
12. a) Derive the intrinsic carrier concentration for intrinsic semiconductor.  
(OR)
- b) Describe the principle, theory and V-I characteristics of Tunnel diode.
13. a) Explain about the origin of ferromagnetism and exchange interaction in ferromagnetic materials.  
(OR)
- b) Derive an expression for internal field in a cubic structure. Deduce the Clausius-Mosotti relation.
14. a) Describe the principle, construction and working of a solar cell.  
(OR)
- b) Explain the working and principle of a Quantum dot laser.
15. a) Discuss density of states in quantum well, quantum wire and quantum dot.  
(OR)
- b) Describe the carbon nano tubes with their properties and applications.
-