QP CODE: 23505501

23505501

Reg No : .....

Name : .....

# INTEGRATED MSC DEGREE EXAMINATION, APRIL 2023

## First Semester

INTEGRATED MSC BASIC SCIENCE-PHYSICS

## CORE - IPH1CR03 - SEMICONDUCTOR PHYSICS

2021 Admission Onwards

8CDDE905

Time: 3 Hours

Weightage: 30

### Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. What are the factors affecting inductance?
2. Which are the four types of transformers based on install location.
3. "The dynamic resistance of an ideal zener diode is zero,but the dc resistance is not so ".why?
4. Give the expression for the ripple factor of a rectifier with different types of filter circuits.
5. Discuss about the line regulation in a voltage regulator and write the expression concerned.
6. Why emitter is heavily doped than collector and base?
7. What is leakage current in BJT? What is the effect of temperature on its leakage current?
8. Write down the advantages and disadvantages of Hartley oscillator.
9. How is JFET used as a VVR? Explain.
10. Draw and explain the circuit symbol of a P channel enhancement type MOSFET.

(8×1=8 weightage)

### Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. What is the colour code of a 5 k Ohm resistor with 5 percent tolerance?
12. Explain Reversed biased P-N junction and Reverse V/I Characteristics ?
13. The current flowing through a p-n junction Si diode is 60 mA for a forward bias of .9 volt at 300K .Determine the static and dynamic resistance of the diode?

14. Why α is always less than one? In a common base connection, current amplification factor is 0.9. If the emitter current is 1mA, determine the value of base current.

15. Explain the phase reversal in CE amplifier.

16. The first stage voltage gain of a two stage amplifier is 100 and its second stage voltage gain is 360. Find the total gain in dB.

17. State the advantages and disadvantages of FET over BJT.

18. Write a short note on transfer characteristics of depletion type MOSFET.

(6×2=12 weightage)

## Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss about electrostatic capacitors and electrolytic capacitors. Which are the various types of electrolytic capacitors? Give some disadvantages of electrolytic capacitors.

20. Draw the circuit diagram of a half-wave recitifier. Explain its working.What is the frequency of ripple in its output?

21. With neat block diagrams, explain the four types of negative feedback amplifiers. Explain what happens to their (i) input resistance and (ii) output resistance with negative feedback.

22. Draw the circuit diagram for plotting the characteristics of JFET, also plot and explain the drain characteristics.

(2×5=10 weightage)