QP CODE: 24019448

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Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / IMPROVEMENT / REAPPEARANCE EXAMINATIONS, MAY 2024

Second Semester

B.Sc Physics Model II Applied Electronics

Vocational Course - AE2VOT03 - BASICS OF POWER ELECTRONICS

2017 ADMISSION ONWARDS

6130E8ED

Time: 3 Hours

Max. Marks : 80

Part A

*Answer any **ten** questions.*

*Each question carries **2** marks.*

1. Explain the formation of depletion region in a JFET.
2. How do you obtain I_{DSS} and V_P from the transfer characteristics curve?
3. Explain DC drain resistance of a JFET.
4. Draw the basic structure of an N channel Depletion type MOSFET.
5. Explain the basic principle in the working of a MOSFET.
6. Why is a depletion type MOSFET know as an ON MOSFET?
7. Write the equation for drain current in the case of an enhancement type MOSFET. Explain the terms.
8. Draw and explain the circuit symbol of a P channel enhancement type MOSFET.
9. What do you mean by biasing? Explain the need for biasing a JFET?
10. Draw the circuit of voltage divider biased JFET.
11. What is the effect of external source resistance on the voltage gain of a common source amplifier?
12. List any two properties of common gate amplifier.

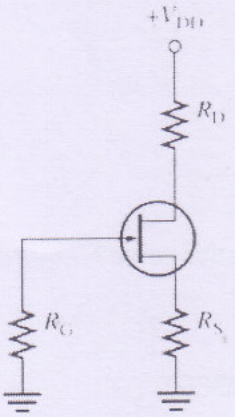
(10×2=20)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. With a neat sketch explain the structure of an N channel and a P channel JFET.
14. A JFET has a drain current of 15 mA. If I_{DSS} = 25 mA and V_P = 5 V, find V_{GS}.
15. Explain the effects of gate to source voltage on drain characteristics.
16. Write a short note on transfer characteristics of depletion type MOSFET.
17. What are the advantages of N channel MOSFET over P channel MOSFET?
18. What is a CMOS? What are its advantages and applications?
19. Find the values of drain to source voltage (V_{DS}) and gate to source voltage (V_{GS}) for the circuit shown in figure below, given I_D = 5 mA, V_{DD} = 10 V, R_D = 1 kΩ, R_S = 500 Ω.



20. With neat diagram explain biasing in depletion type MOSFET.
21. With an external drain resistance of 2 kΩ a JFET has g_m = 3 ms. Determine the value of ideal voltage gain of the common source amplifier.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **15** marks.*

22. Explain the five important specification ratings with typical values of JFET and explain their practical significance.
23. Describe FET. Compare Junction Field Effect Transistor and a Bipolar Junction Transistor.

24. With neat schematic diagrams explain the working of an Enhancement type MOSFET. Draw and explain the drain characteristics.

25. Discuss how to set a Q point in a self-biased JFET? Also explain the setting of a Q point using D.C load line.

(2×15=30)