QP CODE: 19101780

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Reg No : .....

Name : .....

B.Sc. DEGREE (CBCS) EXAMINATION, MAY 2019

Second Semester

B.Sc Physics Model II Applied Electronics

Vocational Course - **AE2VOT03 - BASICS OF POWER ELECTRONICS**

2017 ADMISSION ONWARDS

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Maximum Marks: 80 **Time: 3 Hours**

Part A

Answer any **ten** questions.

Each question carries **2** marks.

1. Explain why BJTs are called bipolar device while FETs are called unipolar devices.
2. What is an N channel JFET? Draw the structure of an N channel JFET?
3. The value of pinch off voltage is reached at a smaller value of drain current if the gate to source voltage is increased. Explain
4. Write the two types of MOSFET and their major differences.
5. Draw the transfer characteristics of a depletion type MOSFET.
6. Define threshold voltage for an enhancement type MOSFET. Explain its significance.
7. Draw and explain the circuit symbol of a P channel enhancement type MOSFET.
8. Distinguish between N channel and P channel MOSFET.
9. Sketch the circuit diagram of a self-biased JFET.
10. Sketch the circuit of a source biased JFET.
11. Draw the biasing circuit for a depletion type MOSFET.
12. Write down the expression for the voltage gain of a common drain amplifier.

(10×2=20)

Part B

Answer any **six** questions.

Each question carries **5** marks.

13. A JFET has a drain current of 15 mA. If I_{DSS} = 25 mA and V_P = 5 V, find V_{GS}.

14. For an N channel JFET I_{DSS} = 8.7 mA; V_P = -3 V; V_{GS} = -1 V. Find the values of (i) I_D (ii) g_{mo} (iii) g_m.

15. Differentiate between BJT and FET.

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

17. Sketch the transfer characteristics of an enhancement type MOSFET. Write the equation for drain current for an enhancement MOSFET.

18. Explain the various handling precautions of a MOSFET.

19. What do you mean by biasing? Explain the need for biasing a JFET. Name the different methods of biasing a JFET.

20. Obtain the expression for voltage gain and input resistance of a common source amplifier.

21. Explain the effect of external source resistance on the voltage gain of a 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. Discuss the JFET parameters and explain its experimental determination.

24. Describe the construction and explain the operation of depletion enhancement IGFET. Also draw 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)