

BACHELOR OF VOCATION
Automotive Mechatronics
Subject: Electronic Devices & Circuits
Subject Code: DBEC-202
Semester: Fifth
January 2021
Theory (External): 35 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled.

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SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A What is meant by depletion layer?
- B Why BJT is called current controlled device?
- C What is thermal runaway?
- D What are the advantages of negative feedback?
- E Mention the significance of h parameters?
- F What are the single tuned amplifiers?
- G What is the need of rectifier? List different types of rectifiers
- H For a p-channel Silicon FET, with effective width $'a' = 2 \times 10^{-4}$ cm and channel resistivity $\rho = 10 \Omega$. Find the pinch off voltage.
- I Define the conditions for oscillations.
- J What is emitter follower?

SECTION -B (ESSAY TYPE QUESTIONS)

(5x5=25 Marks)

1. What is zener diode? Draw its V-I characteristics. Explain how it can be used as voltage regulator.
2. Draw and explain drain and transfer characteristics of depletion type MOSFET.
3. Draw a transistor amplifier using self bias (CE configuration) and explain the operation.
4. Explain the constructional features and working of N-channel JFET. Also draw its well labelled characteristics.
5. Draw the circuit diagram of voltage series amplifier and derive an expression for input and output impedance
6. A full wave rectifier circuit with C-type capacitor filter is to supply a D.C. Current of 20 mA at 16V. If frequency is 50 Hz ripple allowed is 5%. Calculate:
 - i) Required secondary voltage of the transformer.
 - ii) Ratio of I_{peak}/I_{max} through diodes and the value of C required.
7. Write the differences between CB, CE, and CC Amplifier configurations.
8. Explain the working of Wien bridge oscillators in detail.

==END OF PAPER==