Shirpur Education Society's

R. C. PATEL INSTITUTE OF TECHNOLOGY, SHIRPUR

An Autonomous Institute

(Affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere)

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(स्वायत्त महाविद्यालय)

Programme: B.Tech in Electronics & Telecommunication Engineering

Year: II/Semester III (Exam Year: 2024-2025)

Subject: Electronics Devices & Circuits **Time:** 09:00 am - 11:00 am (02:00 Hrs.)

Date: 09 Dec 2024 **Max Marks:** 60

END SEMESTER EXAMINATION ODD SEM -III (2024-2025)REGULAR

Instructions: 1. This question paper contains 2 pages
2. Answer to each new question to be started on a fresh page.
3. Figure in right hand side indicates full marks
4. Draw neat diagrams wherever required.
5. Assume suitable data if required.

1. **15**

A. For the biasing circuit shown in fig.1.b Determine the IC, V_{CE}, V_C, V_B and V_E. **10**

Transistor parameters are: VBE=0.7V, and β=120.

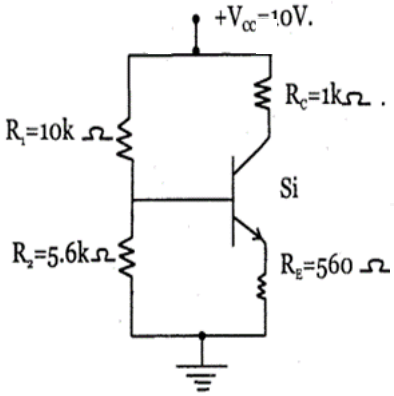

fig.1.b

B. . **5**

i. What is biasing? Why there is a need of biasing? Also explain what are the factors affecting stability of the transistor. **5**

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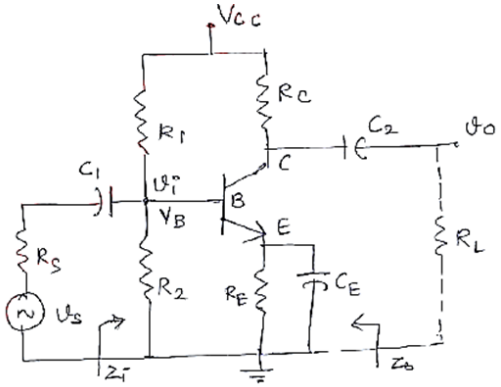
ii. For a voltage divider biasing circuit, β = 100, RB=370K and RE=2K. Determine the stability Factor. **5**

2. **15**

A. Draw and explain high frequency model for BJT in CE configuration. **5**

B. . **10**

i. Draw a small signal equivalent circuit of the given circuit in fig. and derive the expression for voltage gain, input impedance and output impedance. **10**



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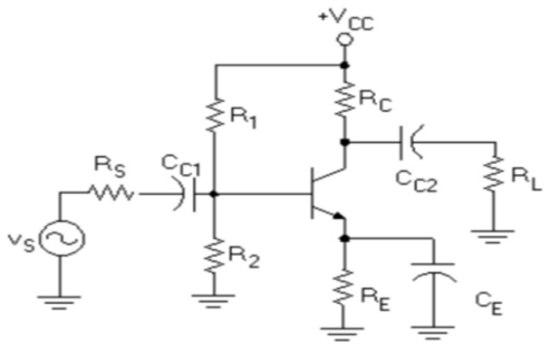
ii. Derive the equation for Lower cutoff frequency FL due to coupling capacitors and bypass capacitors for the CE amplifier circuit shown below. also find expression for midband voltage gain. **10**



3. **15**

A. What are the various topologies of negative feedback amplifiers? Discuss any one in detail. **5**

B. . **10**

i. Draw and explain the construction and working of N-Channel Depletion type MOSFET in detail with transfer and drain current characteristics. **10**

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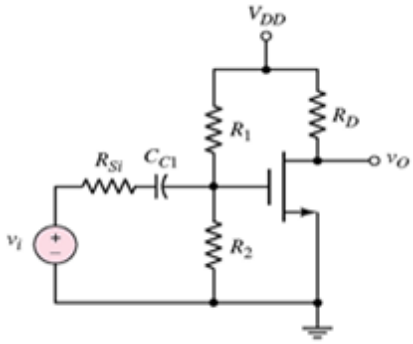
ii. For the MOSFET common source amplifier shown in fig. below, analyze and derive the expression for voltage gain and input impedance. **10**



4. **15**

A. Draw and explain Hartley oscillator using BJT. **10**

B. . **5**

i. Derive an expression for maximum power efficiency of a Class B Push pull Power amplifier. **5**

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ii. Differentiate between Voltage amplifier and power amplifier. **5**