

Program: **Electronics and Computer Science (ECS)**

Curriculum Scheme: Rev2019

Examination: SE Semester III

Course Code: ECC 302 and Course Name: Electronic Devices (ED)

Time: 2hour 30 minutes

Max. Marks: 80

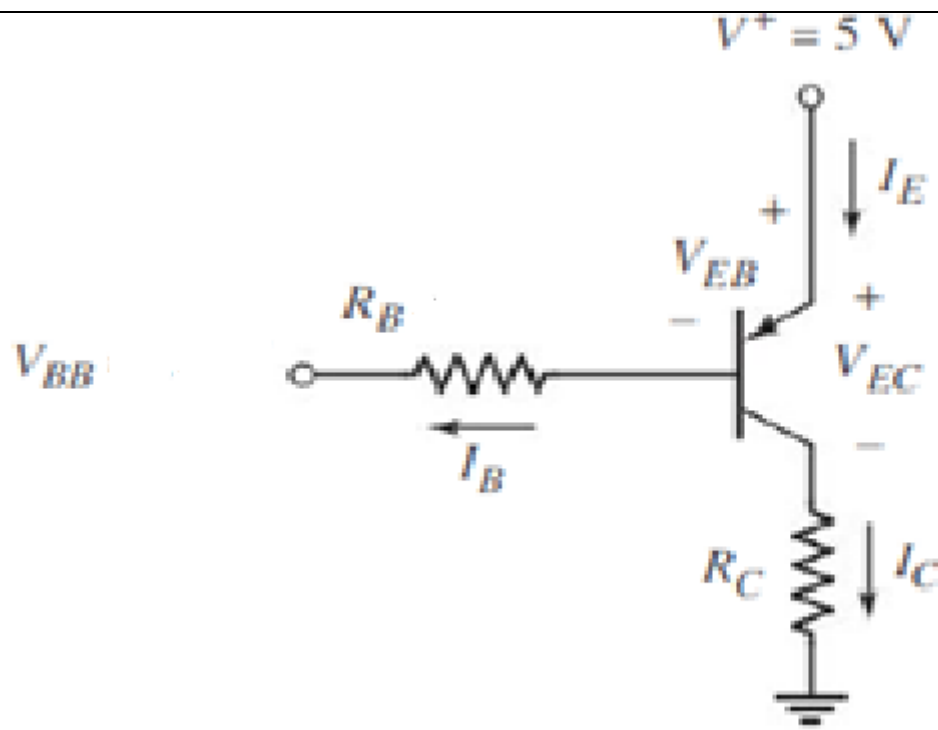
Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks
1.	If the positive terminal of the battery is connected to the anode of the diode, then it is known as
Option A:	Forward Bias
Option B:	Reverse Bias
Option C:	Zero Bias
Option D:	Depletion Region
2.	If the voltage of the potential barrier is V_0 . A voltage V is applied to the input, at what moment will the barrier disappear?
Option A:	$V < V_0$
Option B:	$V > V_0$
Option C:	$V = V_0$
Option D:	$V = 0$
3.	Zener Breakdown occurs in
Option A:	Heavily doped PN junction
Option B:	Lightly doped PN junction
Option C:	Moderately doped PN junction
Option D:	Forward Bias PN junction
4.	Calculate the collector current for a transistor in the forward active mode, given $\beta = 100$ and $I_B = 15\mu A$
Option A:	0.5 mA
Option B:	1 mA
Option C:	5 mA
Option D:	2.25 mA
5.	If Base-Emitter junction is Reverse biased and Base-Collector junction is Reverse biased , the transistor is working in -----
Option A:	Forward Active Mode
Option B:	Reverse Active Mode
Option C:	Cut off
Option D:	Saturation
6.	Choose the incorrect option according to self bias circuit?
Option A:	Voltage gain increases
Option B:	Stability factor is independent of collector resistance
Option C:	BJT can be used in either of the three configurations
Option D:	Excellent stability in collector current is achieved
7.	For best operation of a BJT, which region must the operating point be set at?
Option A:	Active region
Option B:	Cutoff region
Option C:	Saturation region
Option D:	Reverse active region

8.	Calculate I_D for n channel JFET, $I_{DSS} = 4 \text{ m A}$, $V_P = -3.5 \text{ V}$, $V_{GS} = 0 \text{ V}$
Option A:	0 m A
Option B:	1 m A
Option C:	2 m A
Option D:	3 m A
9.	How many diodes are used in full wave bridge rectifier?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
10.	Semiconductor device based on the spinning of electrons are known as:
Option A:	Memristor
Option B:	Quantum Dots
Option C:	Tunnel diode
Option D:	LED

Q2.	Solve any Four out of Six (5 marks each)
A	Explain the current equation of P-N junction diode.
B	Explain the difference between Zener breakdown and Avalanche breakdown
C	What do you mean by Thermal Runaway?
D	Explain the small signal equivalent model for AC analysis of MOSFET.
E	Explain the working of pi filter. Draw appropriate diagrams.
F	State the working of Memristors

Q3	Solve any Two Questions out of Three (10 marks each)
A	A 230 V, 50Hz, voltage is applied to the primary of a 2: 1 step down transformer used in a bridge rectifier having a load resistance of 400Ω . Assume diodes to be ideal .Find a).dc output voltage b).dc power delivered to the load c).PIV d).output frequency
B	Derive expression for DC output voltage AC output voltage for a full wave rectifier.
C	Explain the effect of Pinch-off on the VI characteristics of JFET

Q4	Solve any Two Questions out of Three (10 marks each)
A	Explain the difference between Clippers and Clampers.
B	For the given circuit, $V_{BB} = 1.8 \text{ V}$, $R_B = 600 \text{ K}\Omega$, $V^+ = 5 \text{ V}$, $V_{EB(\text{on})} = 0.6 \text{ V}$, $\beta = 120$. Find I_B , I_C , I_E and R_C , such that $V_{EC} = 0.5 \text{ V}^+$

	 <p>The diagram shows an NPN common-emitter BJT amplifier circuit. The base is connected to a base resistor R_B and a base voltage source V_{BB}. The emitter is grounded. The collector is connected to a collector resistor R_C and a supply voltage $V^+ = 5\text{ V}$. The output is taken from the collector. Currents I_E, I_C, and I_B are indicated. Voltages V_{EB} and V_{EC} are also indicated.</p>
C	Explain the operation of combinational clipper with input and output waveform and transfer characteristics