INSTRUCTIONS TO BE FOLLOWED

- **Allotted time for examination is 3 hours 15 min that includes time for downloading the question paper, writing answers, scanning of answer sheets and E-mailing the PDF files to the designated Email ID.**
- **All the ECE-A students should send their answer sheets on this Email ID- btech3rdecea@kuk.ac.in**
- **All the ECE-B regular and reappear students should send their answer sheets on this Email ID- btech3rdeceb@kuk.ac.in**
- **The candidates will be required to attempt 75% of the question paper (maximum) by choosing to their any best questions accumulating 56 marks.**
- **The PDF files should be saved as Roll No. and Subject Code. Proper attention should be given while sending the email and in the subject line, the Roll Number and Subject Code should be mentioned.**
- **Maximum Page Limit should be 20 (Twenty) for attempting the question paper on A4 sheets which could be downloaded and printed from the sample sheets given in the Kurukshetra University Examination guidelines.**
- **Over-attemptation should be avoided.**
- **Handwriting should be neat and clean and diagrams should be clear and contrasted.**
- **The candidate should not write their Mobile No. otherwise Unfair Means Case will be made.**
- **While attempting the paper, the candidate will use blue/black pen only.**
- **Before attempting the paper, the candidate will ensure that he/she has downloaded the correct question paper. No complaint for attempting wrong question paper by the candidate will be entertained.**
- **Candidate must ensure that he/she has put his/her signature on each page of the answer sheet used by him/her. Answer sheet without the signature of the candidate will not be evaluated.**

PART-A

Q. No. – 1 Answer the following questions. 15x1=15

(i)	Plot the characteristics of an ideal diode in forward and reverse bias.
(ii)	Define transconductance.
(iii)	Define PIV.
(iv)	When a transistor is used as a switch, it is stable in which two distinct regions?
(v)	What is the function of emitter terminal in BJT?
(vi)	The unit of h_{11} is _____
(vii)	The BJT is a _____ device. The FET is a _____ device.
(viii)	Why the value of ideal voltage regulation should be zero?
(ix)	Draw the transfer characteristics of JFET.
(x)	A transistor has current gain of 0.99 in CB configuration. What is the value of current gain in CE configuration?
(xi)	Write the ripple factor, efficiency and PIV of full wave rectifier.
(xii)	Why FET's are known as voltage controlled devices?
(xiii)	Write all the pin functions of the voltage regulator IC.
(xiv)	The breakdown mechanism in a lightly doped p-n junction under reverse biased condition is called_____
(xv)	Draw the circuit diagram of zener diode shunt voltage regulator.

PART-B

2	Differentiate between clippers and clamper circuits. Explain negative clamper in detail.	5
3	In a transistor circuit, I_E = 4mA, I_C = 3.95mA, I_{CEO}= 100 μA. Calculate β and leakage current $I_{CBO.}$	5
4	Explain the small signal model of FET? What are its limitations at high frequencies?	5
5	With the help of waveforms explain complete DC power supply.	5

PART-C

6	Develop a relationship between conductivity and mobility in case of intrinsic and extrinsic Semiconductors.	10
7	Explain the V-I characteristics of PN junction diode showing the knee voltage and breakdown voltage along with the diode equation.	10
8	Distinguish between BJT and FET. Explain the working of NPN transistor in active and saturation modes with proper biasing circuits.	10
9	What are hybrid parameters? Draw the hybrid equivalent model of CB transistor amplifier using hybrid parameters. Also calculate current and voltage gain of CB transistor amplifier in terms of h-parameters.	10
10	a. Discuss various FET parameters and derive the relationship between them. b. Explain the drain and transfer characteristics of MOSFET showing the pinch off region in both.	5 5
11	What is a MOS capacitor. Draw the energy band diagrams of MOS capacitor when positive and negative voltage is applied at the gate terminal.	10

12	In the Zener diode shunt voltage regulator, find i) Output Voltage ii) Voltage across R_s iii) Current through zener diode If input voltage is 22V, $R_s = 8K\Omega$, $V_Z = 8V$ and $R_L = 16K\Omega$	10
13	Differentiate between in the working of transistor series and controlled transistor voltage Regulator with the help of block and circuit diagrams.	10