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GUESS PAPER

Electrical Engineering

II B.Tech. III Sem: 3EE4-06

Analog Electronics

Unit 1:

Short Answers:(2 Marks Each)	CO	BTL
Q. 1 Define Peak Inverse Voltage of Rectifiers.	CO-1	BTL-1
Q. 2 Define the meaning of ideal diode		
Q. 3 What is Clipper and Clamper Circuit	CO-	BTL-1
Q. 4 Define Avalanche Breakdown and Zener Breakdown	1	BTL-2
Q. 5 Why Zener Diode is used as Voltage Regulator?	CO-	BTL-2
Q. 6 Difference between Series and Shunt Clipper	1	BTL-1
Q.7 Difference between Positive and Negative Clamper	CO-	BTL-1
	1	
	CO-	
	1	
	CO-	
	1	

Descriptive Answers: (4 to 10 Marks)

Q. 1 Explain and draw the circuit diagram of Full Wave Rectifier. Calculate Average and RMS Value of Output Voltage, efficiency, peak Inverse Voltage for Full Wave Bridge Rectifier.	CO-1	BTL-3
Q. 2 Explain Clamper Circuits along with its type	CO-1	BTL-1
Q. 3 Explain Clamping Circuits along with its types	CO-1	BTL-2
Q. 4 Explain Clipper and Clamper Circuits and its types with suitable diagrams.	CO-1	BTL-3
Q. 5 Draw and Explain the working of Bridge Rectifier with suitable diagram.		
Q.6 Explain the working of Half Wave Rectifier with suitable diagram.		BTL-2

Q.7 Write a short note on: (i) Negative Clamper Circuit (ii) Series Clipper Circuit	**CO-1**	**BTL-3**
Q.8 Draw and explain the I-V Characteristics of an Ideal Diode.	**CO-1**	**BTL-3**

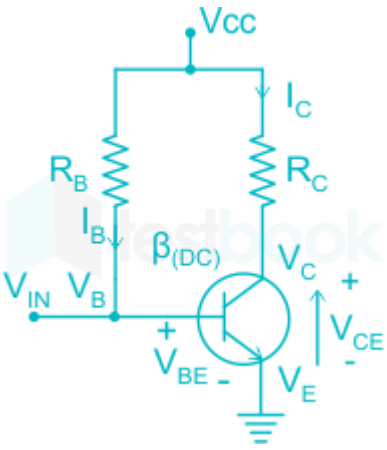
Q.9 Explain the working of the Zener Diode along with its I-V Characteristics? What do you understand by Avalanche Breakdown and Zener Breakdown?	**CO-1**	**BTL-2**
Q.10 Explain Half Wave and Full Wave Rectifier. Explain its working along with suitable diagrams.	**CO-1**	**BTL-3**

Unit 2

Short Answers:(2 Marks Each)	**CO**	**BTL**
Q. 1 Draw structure and symbol of BJT with its basic features.	**CO-2**	**BTL-1**
Q. 2 Write down 3 applications of BJT.	**CO-2**	**BTL-2**
Q. 3 What is Small Signal Model of BJT?	**CO-2**	**BTL-2**
Q. 4 Define Current Controlled Device and Voltage Controlled Device	**CO-2**	**BTL-1**
Q. 5 What do you mean by Operating Point?	**CO-2**	**BTL-1**
Q. 6 Explain the significance of Q-Point and its determination.	**CO-2**	**BTL-2**
	CO-2	**BTL-1**
	CO-2	
	CO-2	
	CO-2	

Descriptive Answers: (4 to 10 Marks)

Q. 1 Explain BJT as a Switch in detail.	**CO-**	**BTL-3**
Q. 2 Explain BJT as an Amplifier in detail.		
Q. 3 What are the different BJT biasing techniques. Explain anyone in brief.	**2**	**BTL-3**
Q. 4 Mention difference between BJT and MOSFET**.**	**CO-**	
Q. **5** Explain the following: (i)Fixed Bias (Base Bias) (ii) Emitter Bias (iii)Collector Feedback Bias of BJT	**2**	
Q.6 Derive Hybrid Pi Model of BJT with suitable diagram.		
Q.7 Derive and explain Pi-Model of BJT along with suitable diagram.		
Q.8 Write a short note on: (i)Advantages of Transistor (ii) Operating Point (iii) Current Mirror		
Q.9 Explain Current Mirror and its Configurations with suitable diagram.		
Q.10 Explain Common Emitter Configuration of BJT in detail.		**BTL-4**
	CO-2	

Q.11 Explain Common Collector and Common Base Configuration of BJT.		
Q12. For given Fixed Bias Configuration of BJT, Calculate Ic, Vcc, Rb and β. If Ib=20μa, Rc=2.7kΩ, Vce=7.2V, Ie=4mA?	**CO-2**	**BTL-3**
	**CO-**	**BTL-3**
	2	**BTL-1,4**
	CO-	
	2	**BTL-3**
Q.13 Explain Small Signal Equivalent Circuit in detail.	**CO-2**	
Q.14 Explain High Frequency Equivalent Circuit in detail.		
Q15. Draw and Explain Structure and I-V Characteristics of BJT with suitable diagram.		

Unit 3

Short Answers:(2 Marks Each)	**CO**	**BTL**
Q. 1 Difference between BJT and MOSFET.	**CO-3**	**BTL-2**
Q. 2 Difference between FET and MOSFET		**BTL-2**
Q. 3 Difference between Enhancement Type and Depletion type MOSFET	**CO-3**	**BTL-1**
Q.4 Define Small Signal Model of MOSFET.	**CO-3**	
Q. 5 Define Pinch off Voltage for MOSFET.	**CO-3**	**BTL-2**
Q.7 Why MOSFET is called as Voltage Controlled Device?	**CO-3**	**BTL-2**
Q.8 Differentiate between BJT and FET	**CO-3**	**BTL-2**

Q. 9 Which MOSFET is called as Normally ON MOSFET and Normally OFF MOSFET? Why? Q. 10 Describe Transition and Diffusion Capacitance in PN Junction Diode?		

Descriptive Answers: (4 to 10 Marks)

Q. 1 Explain the construction and characteristic of N-Channel depletion type MOSFET along with its working? Draw its drain and transfer characteristics. Also define Pinch off Voltage. **Q. 2** Mention the difference between Transistor and MOSFET. **Q. 3** Explain how MOSFET works as Switch in detail. **Q. 4** Explain how MOSFET works as an Amplifier in detail. **Q. 5** What are the different biasing techniques used in MOSFET. Explain anyone in detail**.** Q.6 Write a short note on: (i) Common Source Amplifer (ii) Common Gate Amplifier (iii) Common Drain Amplifier Q.7 Explain Small Signal Equivalent Circuit and derive the following: (i) Gain (ii) Input Impedance (iii) Output Impedance (iv) Transconductance Q.8 Explain High Frequency Equivalent Circuit of MOSFET in detail. Q.9 Draw and Explain Structure and I-V Characteristics of MOSFET.	**CO-3** **CO-3**	**BTL-3** **BTL-2**

Unit 4:

Short Answers:(2 Marks Each)	CO	BTL
Q. 1 Explain the operation of a Differential Amplifier.	CO-4	BTL-2
Q. 2 Define the concept of Virtual Ground.		BTL-2
Q. 3 Difference Between Voltage Amplifier and Power Amplifier	CO-4	BTL-2
Q. 4 How Current Amplifier differ from Power Amplifier.		BTL-3
Q. 5 What are the applications of Differential Amplifier?	CO-4	
Q. 6 Write down 2 advantages and disadvantages of Class A Power Amplifier.		
Q. 7 Write down Advantages and disadvantages of Class B Amplifier.	CO-4	BTL-2
Q. 8 What are the different types of Coupling used in Multistage Amplifier.		
Q. 9 Define Voltage Follower and Slew Rate with the help of an Op-Amp.		
Q. 10 How does an Oscillator differ from an Amplifier	CO-4	

Descriptive Answers: (4 to 10 Marks)

Q. 1 What is the purpose of Multistage Amplifier?	**CO-4**	**BTL-1,3**
Q. 2 Define the following electrical Parameters of Op-Amp (i) Input Bias Current (ii) Input Offset Current (iii)Slew Rate (iv) CMRR (v) Output Offset Voltage (vi) Gain Bandwidth Product		
Q. 3 What is Cascading or Multistage amplifier? Explain the need for cascading of amplifiers also discuss effect of cascade amplifier on bandwidth?	**CO-4**	**BTL-4**
Q. 4 (i) Describe concept of Stability and Margin. (ii) What is meant by Cross Over Distortion in Class B Amplifier? Explain how it is overcome in Class AB Amplifier/	**CO-4**	**BTL-2**
Q. 5 Explain the classification of Power Amplifier on the basis of operating point?	**CO-4**	**BTL-2**
Q.6 Write a short note on: (i) Frequency Distortion (ii)Phase Distortion (iii) Harmonic Distortion (iv) Cross Over Distortion Q.7 Draw and Explain characteristics of Class A Power Amplifier along with suitable diagram? Q. 8 Explain the working of Transformer Coupled Class A Amplifier? Q. 9 A Transformer Coupled Class A amplifier supplies 3watt Power to Speaker. If supply voltage is 30 volts & Icq is 200mA then find efficiency of this amplifier? Q. 10 Differentiate between Single Ended Class B Amplifier and Push-Pull Class B Amplifier? Q. 11 Explain the working of Class AB Amplifier with suitable diagram. List out advantages, disadvantages and applications of Class AB Amplifier. Q. 12 Explain Characteristics of an Ideal Op-Amp in detail. Q. 13 Explain Non-Idealities in an Op-Amp in detail.	**CO-4**	**BTL-2**

Unit 5 & Unit 6:

Short Answers:(2 Marks Each)	CO	BTL
Q. 1 What is Integrator and What are the application of Integrator?	CO-5	BTL-1
Q. 2 Write down the characteristics of an Ideal Op-Amp?		BTL-1
Q. 3 Define the concept of Virtual Ground	CO-5	BTL-4
Q. 4 What are the types of Analog to digital Converter? Which Analog to digital Converter is best for conversion?	CO-5	BTL-4
Q. 5 Define Filter? What is the difference between Active Filters and Passive Filters.		
Q. 6 What are the applications hysteretic comparator?		
Q. 7 What are the applications of Peak Detector?	CO-5	
Q. 8 What is the function of Precision Rectifier?		
Q. 9 What is the purpose of Monoshot?		BTL-3
Q. 10 What is the purpose of Astable Multivibrator?		
	CO-5	

Descriptive Answers: (4 to 10 Marks)

Q. 1 What is Analog to Digital Conversion. Explain any one of its conversion techniques along with circuit diagram.	CO-5	BTL-1
Q. 2 Draw the circuit diagram of Wein Bridge Oscillator using Op-Amp and Frequency of Oscillator?	CO-5	BTL-2
Q. 3 Draw the circuit diagram of Op-Amp Integrator and derive the output expression.	CO-5	BTL-4
Q. 4 Write Short Note on: (i) Differential Amplifier (ii) Ideal Op-Amp Characteristics (iii) Instrumentation Amplifier		
Q.5 Connect the Op-Amp in Non-Inverting Mode of operation & deduce the expression for its clear loop gain.		
Q. 6 (a) Draw the circuit of Op-Amp Integrator and derive the output expression. (b) A 10mV, 2kHz sinusoidal signal is applied to input of Op-Amp Integrator for which R1= 100kohm & C1= 1microF. Find output Voltage.		
Q. 7 Define the following with respect to Performance Characteristics of ADC. (i) Resolution (ii) Accuracy	CO-5	BTL-2
Q. 8 Write a short note on: Zero Crossing Detector	CO-5	BTL-2
Q. 9 Draw and Explain Square Wave Generator in detail		
Q. 10 Explain the working of Square Wave Generator and Triangular Wave Generator.		

Q. 11 Write a short note on: (i) Half Wave Precision Rectifier (ii) Full Wave Precision Rectifier **Q. 12** Explain the working of Peak Detector using suitable circuit diagram. **Q. 13** Explain the working of Monostable Multivibrator using Op-Amp. **Q. 14** Explain the working of Astable Multivibrator with suitable diagram. **Q. 15** Write a short note on: (i) Non-Inverting Zero Cross Detector (ii) Inverting Zero Crossing Detector **Q. 16** Derive the expression for closed loop Inverting Amplifier, Non-Inverting Amplifier , Differentiator and Integrator with the help of an Op-Amp.		