Satyug Darshan Institute of Engineering & Technology, Faridabad

Department of Computer science and engineering

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Programme: B.Tech CSE	Year & Semester:-2nd Year and 3rd sem
Course Name: Analog Electronic Circuits	Course Code: ELU-203-V
Prepared by: Vineeta Choudhary	

Unit I

Short answer questions

Q.No.	Question	KL
1	Define the following terms: Peak Inverse Voltage (PIV), Ripple Factor, and Knee Voltage.	1
2	Draw the circuit symbols for a PN junction diode, Zener diode, and LED.	2
3	State the standard cut-in voltage for Silicon (Si) and Germanium (Ge) diodes	3
4	List the differences between an ideal diode and a practical diode.	4
5	Calculate the forward current of a PN junction diode given the forward voltage and temperature	5
6	Solve for the Q-point (operating point) of a diode circuit using the load line analysis method.	3
7	Differentiate between Avalanche breakdown and Zener breakdown mechanisms.	5
8	Analyze how the presence of a capacitor filter affects the ripple factor and output voltage of a rectifier.	4
9	Design a Zener diode voltage regulator circuit to maintain a constant 5V output from a varying 10V–15V input.	5

Long answer questions

Q.N.	Question	KL
1	Describe the operation of a PN junction diode under forward and reverse bias conditions.	2
2	Explain the formation of the depletion region in an unbiased PN junction.	3
3	Discuss the effect of temperature on the reverse saturation current of a diode.	4

4	Compare the performance of Half-Wave, Center-Tapped Full-Wave, and Bridge rectifiers.	5
5	Sketch the V-I characteristics of a diode for specific conditions (e.g.,Rf=0,Vγ=0.6Vcap V sub gamma equals 0.6 cap V,$V\gamma$=0.6V).	2
6	Compare the use of Zener diodes versus standard PN junction diodes in voltage regulation applications.	3
7	Examine why Silicon is generally preferred over Germanium for manufacturing semiconductor devices.	4
8	Evaluate the necessity of using a bridge rectifier over a center-tapped rectifier for a specific power supply design.	5
9	Propose a multi-stage clipper circuit to limit an input signal between +3V and -2V. .	4
10	Justify the selection of a specific diode (e.g., Schottky, Tunnel, or Varactor) for high-frequency switching applications.	3

Unit II

Short answer questions

Q.N.	Question	KL
1	Define the term "transistor" and name the three terminals of a Bipolar Junction Transistor (BJT)	1
2	Explain the fundamental difference between an NPN and a PNP transistor in terms of majority charge carrier flow.	2
3	Calculate the collector current (IC) for a BJT with a base current (IB) of 50 μA and a current gain (β) of 100.	3
4	Justify why the Common Emitter (CE) configuration is the most widely used arrangement for amplification purposes in electronic circuits.	4
5	Design a simple switching circuit using an NPN transistor that illuminates an LED when a 5V signal is applied to the base.	5
6	Describe the physical conditions required for a BJT to operate in the "Active Region."	5
7	Differentiate between the "Saturation" and "Cut-off" regions of a BJT and identify which state represents a closed switch.	5
8	State the relationship between alpha and beta.	4
9	Calculate the value of alpha if collector current is 12 amp. and base current is 15amp.	3

Long answer questions

Q.N.	Question	KL
1	Derscribe the characteristics of a common emitter amplifier in terms its voltage current graph and design .	3
2	Enlist all the applications of BJT in industries.	4

3	Give the difference between common base, common collector and common emitter in terms of its input output characteristics.	2
4	Describe small signal model for BJT with the help of pie network.	3
5	Explain the major difference between high frequency model and small signal frequency model.	2
6	Draw the configuration of BJT for all the terminals.	4

Unit III

Short answer questions

Q.N.	Question	KL
1	Define the transconductance for the mosfet.	2
2	Explain how MOSFET functions?	3
3	Differentiate N and P type mosfet .	3
4	Give named of three terminals of mosfet.	2
5	Enlist few applications of mosfet.	4
6	Differentiate between BJT and MOSFET.	2

Long Questions

Q.N.	Question	KL
1	Explain the common drain characteristics for a JFET.	3
2	Explain the construction ,working and characteristics of P-channel depletion type MOSFET.	3
3	Write a short note on E-MOSFET as an amplifier.	1
4	How will you determine the gate characteristics and their indication.	1
5	Compare Depletion and Enhancement type MOSFET.	4
6	Give comparison between JFET and MOSFET.	4

UNIT- IV

Short Questions

Q.N.	Question	KL
1	Define slew rate and common mode rejection ratio.	2
2	OP-AMP is an important device in electronic system. How?	3
3	Give few applications of OP-AMP.	2
4	Define power amplifier.	2
5	Define voltage and current amplifier.	2

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Long Questions

Q.N.	Question	KL
1	Explain the working of precision rectifier. How does it differ from a conventional rectifier, and why is it important in signal processing.	2
2	Draw the circuit diagram and pin diagram OP-AMP.	4
3	Why instrumentation amplifiers are preferred for precise and low-noise signal measurements.	2
4	Give some practical applications of OP-AMP used in Industries.	2
5	Draw the circuit of the integrator circuit using op-amp.	4

Unit- V

Short Questions

Q.N.	Question	KL
1	Draw the diagram for zero-crossing detector.	4
2	Draw the circuit of peak detector using op-amp.	4
3	Define slew rate and common mode rejection ratio.	2
4	Define Lead/Lag amplifier.	2
5	Define voltage and current amplifier.	2

Long Questions

Q.N.	Question	KL
1	Draw and explain the working of OP-AMP as analog to digital converter.	4
2	Differentiate between active nad passive filters and also give advantages of increasing order of filters.	2
3	Derive an expression for the frequency of wein bridge oscillator.	3
4	Draw the diagram of triangular wave generator using op-amp . And find out the expression for the frequency of oscillations.	4
5	Give the necessary condition of gain while designing RC phase shift oscillations.	2