

[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2064)

14678

B. Tech 4th Semester Examination
Pulse Shaping and Wave Generation (O.S.)
EC-4005

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all selecting one question each from sections A, B, C and D. Section - E is compulsory.

SECTION - A

1. (a) What is meant by linear wave shaping? How high pass RC circuit act as an differentiator?
(b) Derive an expression for the output of a low-pass circuit excited by an exponential input.
(c) Find the cut off frequency of a low-pass circuit.
(8+6+6=20)
2. (a) What is an avalanche diode? How it is different than pn junction. What is the effect of temperature on the working and avalanche break down?
(b) Explain the phenomenon of Latching in a transistor switch.
(c) Draw the collector waveform of transistor switch and indicate all the time intervals. What the factors that contributes the delay time of transistor switch?
(6+7+7=20)

14678/900

[P.T.O.]

SECTION - B

3. (a) Classify different types of clipper circuits. Give their circuits and explain their operation with the aid of transfer characteristics.
- (b) How the clipping circuits are used in non-linear wave shaping? Draw a circuit to transmit that part of a sine wave which lies -3V and +6V and explain its working.
(10+10=20)
4. (a) A 100V peak square wave with an average value of 0V and a period of 20ms is to be negatively clamped at 25V. Draw the input and output waveforms and necessary circuit diagram.
- (b) What is negative clamping? Explain it with suitable circuit. Derive the relation between the tilts in the forward and reverse directions of the output of a clamping circuit excited by a square-wave input.
(10+10=20)

SECTION - C

5. (a) Draw and explain the circuit diagram of integrated positive RTL NOR gate.
- (b) Describe the various characteristics of logic families. Compare the RTL and DTL logic families in terms of Fan out, propagation delay, power dissipated per gate and noise immunity.
(10+10=20)
6. (a) What are registers? Explain the circuit for dynamic shift register.
- (b) Explain the circuit diagram of Direct coupled transistor logic.
(10+10=20)

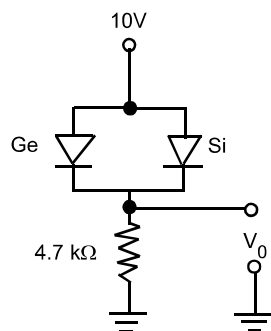
SECTION - D

7. (a) Show that an astable multivibrator can be used as a voltage to frequency converter. What is blocked condition in an astable multivibrator? How to overcome it?

- (b) With the help of a neat circuit diagram, explain the working of an emitter coupled monostable multivibrator. Draw and explain the base and collector waveforms of a monostable multivibrator. (10+10=20)
8. (a) Draw the circuit diagram of the unidirectional diode gate with more than two inputs and explain its operation.
- (b) Draw the circuit diagram of a bidirectional sampling gate circuit and explain its working. (10+10=20)

SECTION - E

9. (i) Why clamping circuit is also known as D.C. inserter?
- (ii) Draw response of high pass RC circuit to ramp waveform,
- (iii) What is difference between high pass and low pass RL circuit?
- (iv) Determine V_{out} for the ckt.



- (v) What is wired logic? Give some examples.
- (vi) Why RC circuit is preferred over RL circuit in wave shaping?
- (vii) Compare ac coupling and dc coupling in Multivibrator.
- (viii) What are the basic logic gates in digital systems?
- (ix) Why are RC circuits commonly used compared to RL circuits?
- (x) Explain the variation of saturation parameters of transistor with temperature? (2×10=20)