Code No: R1631024 **R16** SET - 1

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What is meant by linear wave shaping?	[2M]
	b)	Write the difference between comparator and clipping circuit.	[2M]
	c)	Write short notes on piece-wise linear diode characteristics.	[3M]
	d)	What is meant by quasi stable state?	[2M]
	e)	What is meant by sweep time and restoration time?	[3M]
	f)	What is Pedestal? Explain.	[2M]

PART -B

2.	a)	A square wave whose peak to peak amplitude is 2 V extends ± 1 V with respect to ground. The duration of the positive section is 0.1 s and that of the negative section is 0.2 s. if this waveform is impressed upon an RC integrating circuit whose time constant is 0.2 s, what are the steady-state maximum and minimum values of the output waveform?	[7M]
	b)	Explain the response of High-pass RC circuit for square wave input.	[7M]
3.	a)	Draw the circuit diagram of emitter coupled clipper and explain its operation.	[7M]
	b)	Design a diode clamper circuit to clamp the positive peaks of the input signal at zero level. The frequency of the input voltage is 750 Hz.	[7M]
4.	a)	Explain about diode forward recovery time and reverse recovery time.	[7M]
	b)	Silicon transistors with h_{FE} (min) = 20 are available. If $V_{CC} = V_{BB} = 10$ V, design the bistable multivibrator.	[7M]
5.	a)	Design a collector coupled one shot with a gate width of 3 ms, using n-p-n transistors.	[7M]
	b)	Draw the circuit diagram of collector coupled astable multivibrator and derive the expression for frequency of oscillations.	[7M]
6.	a)	Draw the exponential sweep circuit and derive the expression for transmission error.	[7M]
	b)	Explain the basic principles behind Bootstrap time base generator.	[7M]
7.	a)	Draw the circuit diagram of two input Diode OR gate and explain it.	[7M]
	b)	Explain the operation of six diode sampling gate.	[7M]

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Code No: R1631024 **R16** SET - 2

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What is an attenuator?	[2M]
	b)	What is meant by positive clamping and negative clamping?	[2M]
	c)	Write the applications of Schmitt trigger.	[3M]
	d)	Define astable multivibrator.	[2M]
	e)	Define transmission error.	[2M]
	f)	Why sampling gates are called linear gates?	[3M]

PART -B

2.	a)	A pulse is applied to low-pass RC circuit. Prove that area under the pulse is same as area under the output waveform across the capacitor.	[7M]
	b)	Explain the response of High-pass RC circuit for step input.	[7M]
3.	a)	Explain clipping at two independent levels using diodes.	[7M]
	b)	State and explain clamping circuit theorem.	[7M]
4.	a)	Discuss about breakdown voltages of a transistor.	[7M]
	b)	Design a bistable multivibrator to meet the following specifications: $V_{CC} = V_{BB} = 12$ V, $I_C(sat) = 6$ mA, h_{FE} (min) = 25 and maximum triggering frequency = 25 kHz.	[7M]
5.	a)	Derive the expression for gate width of a monostable multivibrator neglecting the reverse saturation current I_{CBO}.	[7M]
	b)	Find the ratio V_{CC} / V , if a voltage to frequency convertor generates oscillations of frequency twice of that when $V = V_{CC}$.	[7M]
6.	a)	What is meant by time base signal? What are the general features of time base signal? Explain.	[7M]
	b)	Explain about transistor miller time base generator.	[7M]
7.	a)	Give the comparison of various logic families.	[7M]
	b)	Discuss about reduction of pedestal in sampling gates.	[7M]

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Code No: R1631024 **R16** SET - 3

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	When does high pass circuit act as a differentiator?	[2M]
	b)	What is the difference between clipping and clamping?	[2M]
	c)	Define delay time and storage time.	[2M]
	d)	Find the period of output and the frequency of oscillation of an astable multivibrator with $R_1 = R_2 = 25\ k\Omega$ and $C_1 = C_2 = 0.2\ \mu F$.	[3M]
	e)	Define displacement error.	[2M]
	f)	Write the difference between sampling gate and logic gate.	[3M]

PART -B

2.	a)	Explain the response of Low-pass RC circuit for exponential input.	[7M]
	b)	Draw the circuit diagram of compensated attenuator and explain it.	[7M]
3.	a)	Draw the circuit of transistor clipper and explain its operation.	[7M]
	b)	Design a diode clamper to restore a dc level of +5 V to an input signal of peak-to-peak value 15 V. Assume the drop across the diode is 0.7 V and the signal frequency is 1 kHz.	[7M]
4.	a)	Explain about design of transistor switch.	[7M]
	b)	Explain the operation of Schmitt trigger.	[7M]
5.	a)	Draw the circuit diagram of collector coupled mono stable multivibrator and explain its operation.	[7M]
	b)	Design an astable multivibrator to generate a square wave of 1 kHz.	[7M]
6.	a)	Explain the basic principles behind miller time base generator.	[7M]
	b)	Discuss about the transistor bootstrap time base generator.	[7M]
7.	a)	Draw the diode logic AND circuit and explain it.	[7M]
	b)	Explain the operation of four diode sampling gate.	[7M]

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Code No: R1631024 **R16** SET - 4

III B. Tech I Semester Regular Examinations, October/November - 2018

PULSE AND DIGITAL CIRCUITS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B)**
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	Define the term 'rise time'.	[2M]
	b)	List out the some applications of voltage comparator.	[3M]
	c)	What is meant by triggering of binary circuit?	[2M]
	d)	Why monostable multivibrator also called gating circuit?	[2M]
	e)	What is meant by voltage time base generator?	[2M]
	f)	Write the some applications of sampling gates.	[3M]

PART -B

2.	a)	Explain the response of High-pass RC circuit for sinusoidal input.	[7M]
	b)	Explain the response of series RLC circuit for step input.	[7M]
3.	a)	Draw the basic circuit of diode clipper and explain its operation with the help of transfer characteristics.	[7M]
	b)	Explain the operation of negative clamping circuit.	[7M]
4.	a)	For a common emitter circuit, V_{CC} = 15 V, R_C = 1.5 kΩ and I_B = 0.3 mA. (i) Determine the h_{FE}(min) for the saturation to occur. (ii) If the R_C is changed to 500 Ω , will the transistor be saturated?	[7M]
	b)	Design a Schmitt trigger circuit to have V_{CC} = 12 V, UTP = 6 V, LTP = 3 V, using silicon transistors with h_{FE} (min) = 60.	[7M]
5.	a)	Calculate the component values of a monostable multivibrator developing an output pulse of 500 µs duration. Assume h_{FE}(min) = 25, I_{CE}(sat) = 5 mA, V_{CC} = 10 V, and V_{BB} = -4V.	[7M]
	b)	Explain how an astable multivibrator can be used as a voltage to frequency convertor.	[7M]
6.	a)	With necessary waveforms, explain the operation of UJT Relaxation oscillator.	[7M]
	b)	What are the different methods to generate time base waveforms? Explain.	[7M]
7.	a)	Draw the circuit diagram of TTL NAND gate and explain it.	[7M]
	b)	Explain the basic principle behind sampling gate.	[7M]

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