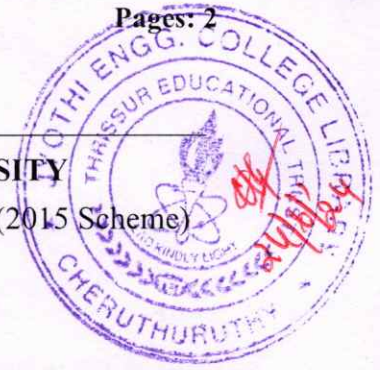


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) / S1 (PT) (S,FE) Examination June 2024 (2015 Scheme)

**Course Code: CS207****Course Name: Electronic Devices & Circuits**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer all questions, each carries 3 marks.*

Marks

- | | | |
|---|---|-----|
| 1 | Draw the circuit diagram of a voltage tripler circuit and mark the polarity and value of the voltages across each capacitor in the circuit. | (3) |
| 2 | Draw a sweep circuit with transistor acting as a switch. | (3) |
| 3 | Write short note on Biased clamper with suitable waveform. | (3) |
| 4 | What is line regulation and load regulation? Explain with equation for percentage of regulation | (3) |

PART B*Answer any two full questions, each carries 9 marks.*

- | | | |
|---|---|-----|
| 5 | a) Design a good differentiator circuit for a frequency 10 KHz. | (5) |
| | b) Draw the circuit of an RC differentiator and explain how it differentiates a square signal. Draw the input and output waveforms. | (4) |
| 6 | a) Design a circuit using passive components to convert a 1KHZtriangular wave to a square wave. | (3) |
| | b) With the help of a block diagram, explain the working of an SMPS. | (6) |
| 7 | a) Draw & explain a circuit to generate an output voltage of, $V_o = 3 V_{in}$. | (3) |
| | b) Draw the characteristics and explain the working of an n-channel JFET. | (6) |

PART C*Answer all questions, each carries 3 marks.*

- | | | |
|----|---|-----|
| 8 | In a transistor circuit, load resistance is $5K\Omega$ and quiescent current is 2mA. Determine the operating point when the battery voltage is $V_{cc} = 12V$. | (3) |
| 9 | Briefly describe the working of a Hartley oscillator. | (3) |
| 10 | What is the effect of cascading in gain and bandwidth of Amplifier? | (3) |
| 11 | What are the conditions for getting sustained oscillations? | (3) |

PART D

Answer any two full questions, each carries 9 marks.

- 12 a) Draw the circuit diagram and explain the working of a common source MOSFET amplifier. (7)
- b) In the Astable multivibrator, $R_1=R_2=10K$ and $C_1=C_2=0.01\mu F$. Determine the time period and frequency of the square wave. (2)
- 13 a) Design a Hartley oscillator to generate a frequency of 150KHz. (5)
- b) Design a transistor based circuit for generating a square wave of 1KHz. (4)
- 14 a) With circuit diagram and design equations explain the working of a monostable multivibrator (9)

PART E

Answer any four full questions, each carries 10 marks.

- 15 a) Describe the working of a binary weighted D/A Converter, with example. (3)
- b) Draw the circuit and frequency response of active low pass and high pass filters. Also draw the circuit of a second order active low pass filter (7)
- 16 a) With functional block diagram, explain the working of 555 timer IC. (4)
- b) Write design equations and pin out of 555 TIMER IC working as astable multivibrator to generate a wave form of 1 KHz, with 50% duty cycle. (6)
- 17 a) Give the ideal characteristics of an OP-Amp. What are their typical values for IC741 OP-Amp. (5)
- b) Draw the figure of an operational amplifier integrator and prove that the output is Proportional to integral of the input. (5)
- 18 a) Design and draw a first order low pass filter using Op-Amp, with higher cut off frequency of 2GHz and pass band gain of 2. (5)
- b) With a neat block diagram explain successive approximation type A/D convertor. (5)
- 19 a) Design a Schmitt trigger circuit using an operational amplifier when input voltage, $|V_{in}| > 3V$. Assume an op-amp power supply voltage of $\pm 12 V$. Draw the circuit diagram and relevant waveforms. (5)
- b) Prove that a weighted resistor network can convert a digital signal to analog signal. What are the drawbacks of this converter? (5)
- 20 a) With functional block diagram, explain the working of 555 Timer IC. (4)
- b) Write design equations and pin out of 555 Timer IC working as astable multivibrator to generate a wave form of 1KHz., with 50% duty cycle. (6)
