

## Paper / Subject Code: 40722 / Electronic Circuits

Duration 3 Hours

Maximum marks 80

- 1) Question 1 is compulsory
- 2) Attempt any three from the remaining questions
- 3) All questions carry equal marks.
- 4) Assume suitable data if necessary.

- Q.1. Attempt any **four** from the following questions
- |       |   |    |
|-------|---|----|
| a     | State and explain Miller theorem?   | 5  |
| b     | Explain the concept of Virtual short and virtual ground.  | 5  |
| c     | Derive expression of voltage gain for Inverting amplifier.  | 5  |
| d     | Draw the circuit diagram and explain the operation of RC Wien Bridge oscillator.  | 5  |
| e     | State the Features of IC 555 Timer.   | 5  |
| Q.2.a | Explain purpose of plotting frequency response of the amplifier. Sketch frequency response of RC coupled amplifier and Define Low, mid and high frequency regions and Bandwidth.          | 10 |
| b     | Compare voltage series, voltage shunt, current series and current shunt feedback amplifiers.  | 10 |
| Q.3.a | Explain Astable multivibrator and derive $T_{on}$ and $T_{off}$ Expression.   | 10 |
| b.    | Explain Inverting Comparator and state various application of comparator.   | 10 |
| Q.4.a | Define following parameters of OP AMP 741. [i] input offset voltage [ii] CMRR [iii] Power supply rejection Ratio [iv] Output resistance [v] Input resistance [vi] Differential mode gain. | 10 |
| b.    | Draw circuit diagram of voltage to current converter. state and explain one application of this circuit.  | 10 |
| Q.5 a | Draw the circuit diagram of differentiator using OPAMP and derive the expression of output voltage. State its applications.   | 10 |
| b     | Design the Schmitt Trigger circuit (generative comparator) to obtain the hysteresis of 2 volts.   | 10 |
| Q.6 a | Draw the circuit diagram of basic MOSFET differential amplifier and explain its operation. sketch and explain its DC transfer characteristics.  | 10 |
| b     | Draw the circuit diagram and explain the operation of RC phase shift oscillator. State expression for frequency of oscillations.  | 10 |

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