



Reg. No. :

Name :

First Semester M.Sc. Degree (CBSS – Reg./Suppl. (Including Mercy Chance)/Imp.) Examination, October 2020 (2014 Admission Onwards)

PHYSICS

PHY 1C04 : Electronics

Time : 3 Hours

Max. Marks : 60

SECTION – A

(Answer both questions (either a or b))

- 1. a) Explain with circuit diagram the closed loop op-amp configuration with voltage series feedback. Derive the expressions for its input resistance and output resistance.

OR

- b) With necessary circuit diagram, input and output waveforms explain the working of an integrator. Also deduce the expression for its output voltage.

- 2. a) Explain with circuit diagram and output waveforms the working of a triangular wave generator. Deduce the expression for its frequency.

OR

- b) Explain with block diagram the conversion of flip flops. With conversion table, K map and logic diagram explain the conversion of

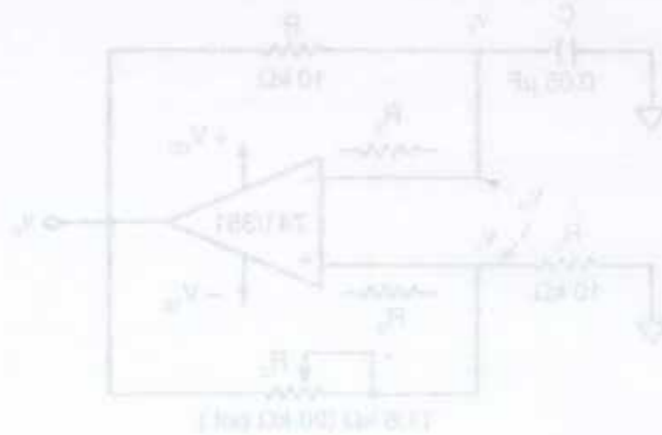
a) SR flip flop to JK flip flop

b) D flip flop to SR flip flop

c) D flip flop to JK flip flop.

(2×12=24)

- a) What do you mean by a zero crossing detector?
- b) Calculate the frequency of the following square wave generator.



- a) Explain with a suitable figure the different registers in 8085 microprocessor.
- b) Explain with a functional diagram the working of a Demultiplexer.
- c) Explain with logic diagram the working of a parallel in serial out shift register.
- a) What do you mean by toggling?
- b) Distinguish between synchronous and asynchronous counters.
- c) Explain with circuit diagram and waveform the working of monostable multivibrator using 555 Timer.

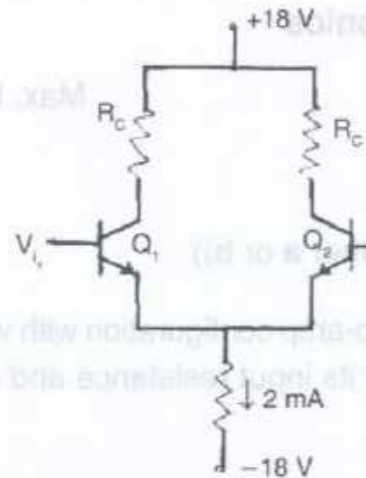


SECTION – B

(Answer any four)

(1 mark for Part a, 3 marks for Part b, 5 marks for Part c)

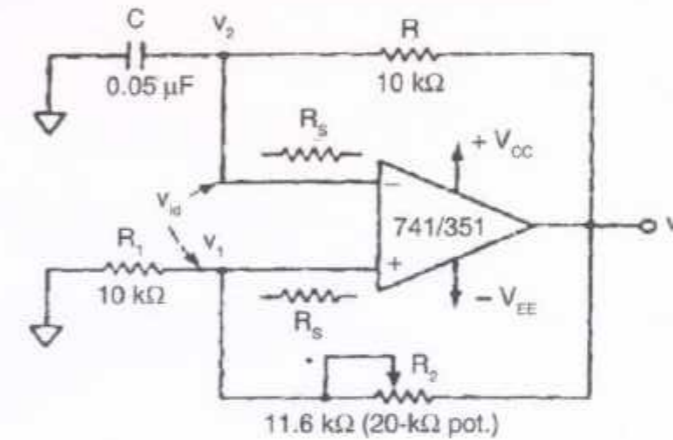
3. a) What is an op-amp ?
 b) Calculate the dc bias values of I_C and V_C for an amplifier with $R_C = 18\text{ k}\Omega$, $V_{CC} = +18\text{ V}$, $V_{EE} = -18\text{ V}$, $V_{BE} = 0.7\text{ V}$ and current flowing through $R_E = 2\text{ mA}$.



- c) Explain with circuit diagram the differential amplifier using transistors and hence obtain the conditions for DC bias.
4. a) What is supply voltage rejection ratio ?
 b) An op-amp has a slew rate of 35 V/ms . How long will it take the output to change from 0 to 15 V ?
 c) Explain with circuit diagram the working of an open loop op-amp in inverting amplifier configuration.
5. a) What are the important characteristics of a comparator ?
 b) If $R = 15.9\text{ k}\Omega$ and $C = 0.01\text{ }\mu\text{F}$ for a Butterworth first order low pass filter, using frequency scaling technique obtain the value of resistance to be used to convert frequency of the filter from 1 kHz to 1.6 kHz .
 c) Explain with circuit diagram the conversion of a triangular wave generator into a sawtooth wave generator.



6. a) What do you mean by a zero crossing detector ?
 b) Calculate the frequency of the following square wave generator.



- c) Explain with a suitable figure the different registers in 8085 microprocessor.
7. a) What is EPROM ?
 b) Explain with a functional diagram the working of a Demultiplexer.
 c) Explain with logic diagram the working of a parallel in serial out shift register.
8. a) What do you mean by toggling ?
 b) Distinguish between synchronous and asynchronous counters.
 c) Explain with circuit diagram and waveform the working of monostable multivibrator using 555 Timer. (4×9=36)