



K19P 1501

Reg. No. :

Name :

I Semester M.Sc. Degree (CBSS-Reg./Suppl./Imp.)

Examination, October - 2019

(2014 Admission Onwards)

PHYSICS

PHY1C04:ELECTRONICS

Time : 3 Hours

Max. Marks : 60

SECTION-A

Answer both questions (either a or b)

(2x12=24)

1. a) Explain with circuit diagram the different types of open loop op-amp configurations.

(OR)

- b) Explain with circuit diagram the summing and averaging amplifiers using

- i) inverting op-amp configuration
- ii) non inverting op-amp configuration.

2. a) Draw the circuit diagram and output waveforms of a square wave generator and explain its working. Also deduce the expression for its frequency.

(OR)

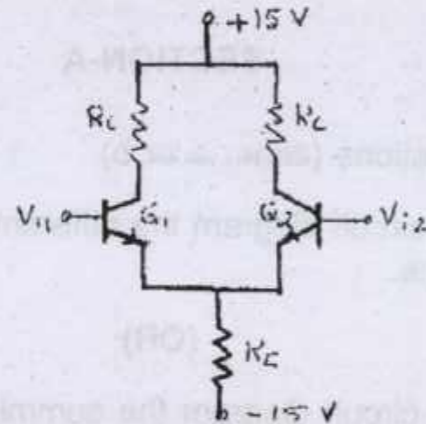
- b) Explain synchronous counter with its advantages and disadvantages. Write the design steps of synchronous counter with excitation of various flip-flops.



SECTION-B

Answer any **Four** (1 mark for part a, 3 marks for part b, 5 marks for part c) **(4x9=36)**

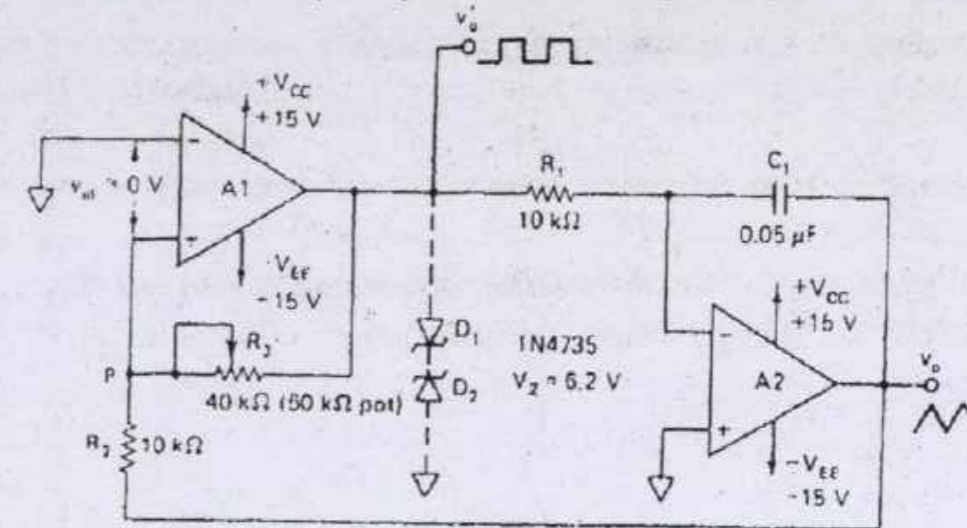
3. a) What is the difference between common mode and double ended operations.
 b) Calculate the dc bias values of I_c and V_c for an amplifier using $R_c=4.7k\Omega$, $R_E=4.7k\Omega$, $V_{BE}=0.7V$ and $V_{CC}=+15V$ and $V_{EE}=-15V$.



- c) Draw the circuit diagram and hence derive the expression for AC voltage of a single ended unbalanced output differential amplifier.
4. a) What is CMRR?
 b) An op-amp has a slew rate of $2V/\mu s$. If the peak output is 15V. What is the maximum value of input frequency for which the output is undistorted?
 c) Explain with circuit diagram the working of a closed loop op-amp with voltage series feedback.
5. a) What do you mean by frequency scaling?
 b) A first order low pass Butterworth filter has cutoff frequency 1kHz, passband gain 2 and capacitance $0.01\mu F$. Find the value of resistance to be connected.
 c) Explain with circuit diagram the working of a schmitt trigger.



6. a) What is a sample and hold circuit?
 b) Calculate the frequency of the following triangular wave generator.



- c) Draw and briefly explain 8085 microprocessor.
7. a) What is ROM?
 b) Why does the conversion time increase with the value of the analog input voltage in a counter type ADC.
 c) Explain with logic diagram serial-in serial-out shift registers using
 i) JK flip flop
 ii) SR flip flop
8. a) What is a latch?
 b) Calculate the time period of 555 Astable multivibrator for $C_1 = 0.01\mu F$, $R_A = 10K\Omega$, $R_B = 50\Omega$
 c) With the help of logic diagram and truth table, explain a one line to eight line demultiplexer.