

FIRST TERM EXAMINATION 2021
STD. XII
ELECTRONICS - I

Max. Marks: 50

Time: 3 Hrs.

- Instructions:** 1. All questions are compulsory.
2. Draw neat diagrams wherever necessary.
3. Figures to the right indicate full marks.
4. Use of log table is allowed.

Q 1 (A) Select correct alternative & rewrite the complete sentence: (4)

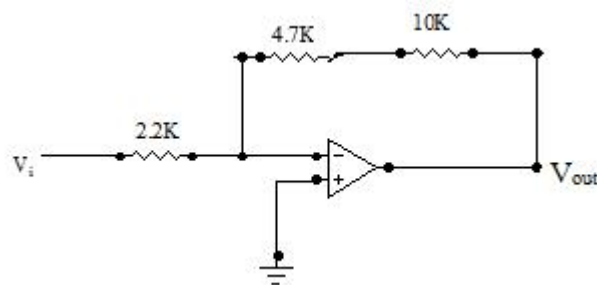
- 1) The average value of the half wave signal is $V_{dc} =$ _____.
a) $0.318 V_m$ b) $0.636 V_m$ 3) $6.36 V_m$ 4) $3.18 V_m$
- 2) The magnitude of beam current can be adjusted by _____ control which varies the negative voltage of the control grid.
a) Focus b) Pressure c) Intensity d) Voltage.
- 3) In Op-amp maximum rate at which the output can change is called as _____.
a) Frequency response b) Slow rate c) Input bias current d) Input offset voltage
- 4) An amplitude modulator performs the mathematical operation _____.
a) addition b) subtraction c) multiplication d) Division

Q1 (B) Attempt any two of the following: (6)

- 1) Draw block diagram of CRO and explain each block.
- 2) Write a note on thermister.
- 3) Explain with the diagram working of unity gain follower using Op-amp.

Q-2)A) Attempt any two of the following : (6)

- 1) In a center-tapped full-wave rectifier secondary voltage is 40V AC using ideal diodes, Calculate the DC load voltage, Current rating and PIV rating for the diodes ,Load resistance is of 47Ω .
- 2) Find out the maximum and minimum voltage gain for the circuit of figure below. IF $V_{in} = -10 \text{ mV}$



Q 2 (B) Attempt any one of the following: (4)

- 1) How Op-amp can be used as subtractor?
- 2) Explain voltage comparator using Op-amp.

Q-3)A) Attempt any two of the following :

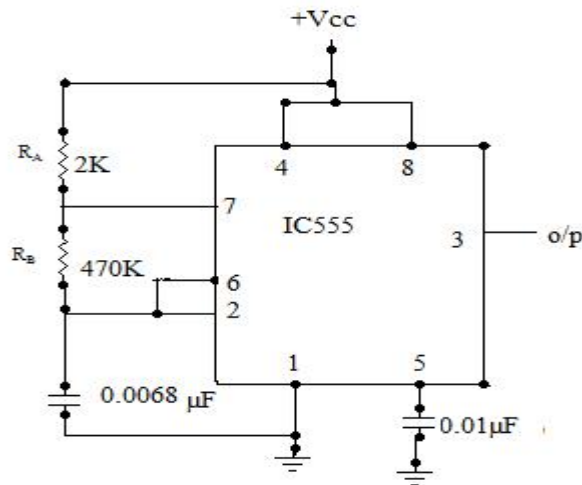
(6)

- 1) What are the advantages of digital multimeter over analog multimeters?
- 2) Explain the working of Zener as Voltage Regulator.
- 3) Explain Op-amp as sign changer and derive expression for gain.

Q-3)B) Attempt any one of the following:

(4)

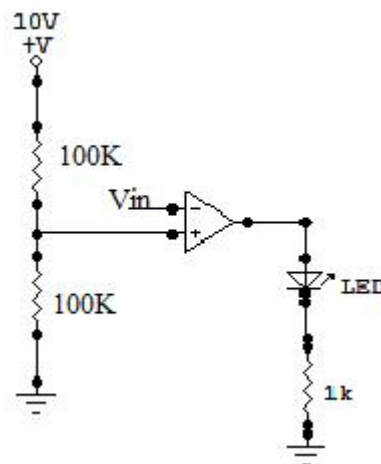
- 1) In a astable multivibrator, derive values of R_A and R_B ,If $f=5$ kHz and $D=68\%$, $C=0.01$ μ F.
- 2) Find frequency and duty cycle from the given circuit diagram.



Q-4)A) Attempt any two of the following :

(6)

- 1) In an inverting amplifier if input resistance is of $22k\Omega$ and feedback resistor is $100k\Omega$ and input voltage is $0.4V$.What will be the input voltage.
- 2) Find out the magnitude of input voltage for which LED connected at the output will glow?

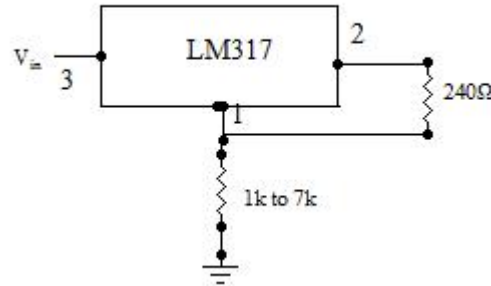


3) Calculate input voltage for the Op-amp as adder for $V_1 = -1\text{ V}$, $V_2 = 0.5\text{ V}$, $V_3 = 1\text{ V}$, $R_1 = 1\text{ k}\Omega$, $R_2 = 2\text{ k}\Omega$, $R_3 = 5\text{ k}\Omega$, $R_f = 10\text{ k}\Omega$.

Q-4)B) Attempt any one of the following:

(4)

1) Calculate the range of output voltage in following circuit.



2) The turn ratio of the transformer used in a bridge rectifier is 12:1. The primary is connected to 220V, 50Hz power mains. Assuming that the diode voltage drops to be zero find:

1) The output DC voltage 2) PIV of the diode.

Q-5)A) Attempt any two of the following :

(6)

1) Draw a block diagram showing basic elements of communication system. Explain function of each element with the suitable examples.

2) Explain amplitude modulation with suitable waveforms and expressions.

3) Explain frequency modulation with example..

Q-5)B) B) Attempt any one of the following:

(4)

1) How Op-amp can be used as a subtraction? Derive an expression for output.

2) Explain working of LVDT and piezoelectric crystal. State its uses.

OR

Q-5)A) Attempt any two of the following :

(6)

1) Explain working of capacitive transducer.

2) Write a note on LDR.

3) Explain importance of modulation index in AM. Draw the diagram.

) Q-5)B) B) Attempt any one of the following:

(4)

1) Explain ring and bus topologies. Give their advantages.

2) Define network topology? Explain star LAN configuration.