1st SEMESTER EXAMINATION-2023

SUBJECT: ELECTRONICS PAPER 1

STD:XII MARKS:50

DIV.:K TIME: 3 HOURS

NOTE: 1. All questions are compulsory.

2. Draw neat diagrams wherever necessary.

3. figures to the right indicate full marks.

4. Use of log tables is allowed.

Q.1 : (A) Select the correct alternative and rewrite the sentence :

1. Slew rate of an OPAMP is measured in ---------

a. μsec/V b. V/ μsec c. μV/ sec d. μV/μ sec

2. In half wave rectifier ripple factor is---------

a. 1.21 b. 0.48 c. 0.121 d. 0.79

3. In function generator for the generation of triangular wave ---------circuit is used.

a. Integrator b. Schmitt Trigger c. Differentiator d. Wave shaping

4. In basic circuit of IC ------- , R-S flip-flop is used.

a. 741 b. 555 c. 317

Q.1 (B) Attempt any TWO of the following.

1. Draw labeled diagram of CRT and explain function of each electrode.

2. What do you mean by:

(a) Line regulation (b) Load regulation (c) Ripple rejection

3. Draw the block diagram of an OPAMP and state the function of each block.

Q.2 (A) Attempt any TWO of the following.

1. Explain the following terms in OPAMP:

(a) Virtual ground (b) Slew rate (c) CMRR

2. Draw functional block diagram of three terminal IC regulator and explain.

3. Draw pin out diagram of IC 555 and explain the function of each pin

Q.2 (B) Attempt any ONE of the following :

1. Draw and explain block diagram of CRO.
2. Draw and explain block diagram of an OPAMP.

Q.3 (A) Attempt any TWO of the following:

1. Explain the function of following controls of CRO.

   (a) Time/Div (b) Focus (c) Intensity

2. Explain the working of OPAMP. Inverting amplifier and derive an expression for its gain.
3. Explain the working of Bridge rectifier with diagram and waveforms.

Q3. (B) Attempt any ONE of the following:

1. Design A-stable multi vibrator using IC 555. Calculate the frequency, if Ra=500Ω, R_b=1.2KΩ and C=0.1μF.Also draw A- stable multi vibrator circuit.
2. Draw block diagram of DMM and explain its working

Q.4. (A) Attempt any TWO of the following:

1. A Non-Inverting OPAMP has input resistance of 10KΩ and feedback resistance of 100KΩ. Calculate the output voltage for the input voltage 0.5V.Draw circuit diagram.
2. Write merits of SMPS.
3. Draw Zener regulator and explain how Line and Load regulation is obtained in it.

Q. 4 (B) Attempt any ONE of the following:

1. Draw OPAMP as Adder and derive an expression for its output.
2. Draw and explain series transistor regulator. Explain current limiting in it.

Q.5 (A) Attempt any TWO of the following:

1. Write the ideal properties of an OPAMP.
2. Explain the use of IC555 as mono stable multi -vibrator.
3. The turns ratio of a transformer used in a half wave rectifier is n_1: n_2=10:1.The primary is connected to AC mains (230V,50Hz).Assuming diode as ideal, calculate the DC voltage across load and find the PIV of diode.

Q.5 (B) Attempt any ONE the following:

1. Draw and explain Time base generator circuit used in CRO.
2. Draw and explain block diagram of Function generator.