

SHRI T P BHATIA JUNIOR COLLEGE OF SCIENCE
FIRST SEMESTER EXAM 2024 -2025
ELECTRONICS PAPER I

DATE:- 25/10/24

TIME:- 3 HOURS

CLASS:- XII

MAX MARKS 50

Instructions :

- (1) All questions are compulsory
- (2) Figures to the right indicate full marks.
- (3) Draw neat labelled diagram wherever necessary.
- (4) Use of log table is allowed.

QIA. Select the correct alternative and rewrite the sentences

4 Marks

1. Average output of a bridge rectifier is ____.

(i) V_m (ii) V_m / π (iii) $2 V_m / \pi$ (iv) $V_m / 2$

2. If a Lissajou's pattern like 8 is obtained, then frequency to vertical input f_y and frequency to horizontal input f_x are related by the equation ____.

(i) $f_y = 2f_x$ (ii) $f_x = 2f_y$ (iii) $f_x = f_y$ (iv) None of the above

3. The resistance of LDR is _____ in dark.

(i) Low (ii) High (iii) 0Ω (iv) 10Ω

4. If a constant D.C. Voltage is applied as input to an integrator using OP-AMP, then the Output Voltage has _____ nature

(i) Ramp (ii) Sinusoidal (iii) Cosine (iv) Sawtooth

QI B. Answer any two of the following.

6 Marks

1. Draw Pin Configurations of : (1) LM 317 (2) LM 741
2. State Linear and Non-linear Applications of OP-AMP.
3. Explain the concept of virtual ground in OP-AMP.

QII A. Answer any two of the following.

6 Marks

1. The turns ratio of a transformer used in a bridge rectifier is $n_1:n_2 = 10:1$. The primary is connected to the AC mains. Assuming ideal diodes, calculate the output voltage, and PIV rating of the diodes
2. State any six ideal characteristics of OP-AMP.
3. Draw a neat labelled diagram of CRT of CRO. What is Aquadag Coating and explain its use.

QIIB. Answer any one of the following

4 Marks

1. What is Piezoelectric effect? Explain with diagram the working of piezoelectric transducer.
2. Explain working of Zero Crossing Detector using OP-AMP as a Comparator.

QIII A. Answer any two of the following.

6 Marks

1. Explain use of OP-AMP as Inverting Adder with necessary diagram and derivation.
2. Explain any three important factors to be considered for selection of a Transducer.
3. In an inverting adder, calculate output voltage if input voltage is 500mV input resistor is 1k and feedback resistance is ten times the input resistance.

QIII B. Answer any one of the following.

4 Marks

1. With neat circuit diagram, derive the output expression for an OP AMP subtractor
2. Explain with diagram and waveforms, working of LC filter for eliminating ripple.

QIV A. Answer any two of the following.

6 Marks

1. With the help of a neat circuit diagram, explain the working of a voltage follower using OPAMP
2. Define active and passive transducers and give one example of each
3. Explain working of LDR.

QIV B. Answer any one of the following.

4 Marks

1. Draw block diagram of OP-AMP and explain function of each block.
2. Explain working of Zener Regulator with suitable graph .

QVA. Answer any two of the following.

6 Marks

1. Compare Half Wave Rectifier and Full Wave Rectifier (Bridge)
2. Explain the working of an opto coupler with neat diagram.
3. Why time base is required in CRO? Explain with neat diagram working of time base circuit

QVB. Answer any one of the following.

4 Marks

1. Explain working of capacitor filter with neat diagram.
2. Draw and explain the functional block diagram of three terminal IC voltage regulator.