

2008

**ELECTRONICS**

PAPER—EL-1104

*Full Marks : 50*

*Time : 2 hours*

Answer **Q. No. 1** and any **three** from the rest

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable*

*Illustrate the answers wherever necessary*

[University written Examination : 40 Marks  
& Internal Assessment : 10 Marks ]

1. Answer *all* questions:

2×5

(a) Why negative modulation is used in TV picture signal transmission? Explain with proper diagrams.

(Turn Over)

(b) Draw the circuit diagram of a series regulated power supply with a current limiting transistor and write down the expression for the output voltage.

(c) Explain the use of an EXOR gate as a phase comparator.

(d) Explain in brief why a Class C amplifier is used as a power amplifier.

(e) Differentiate between a transducer and a sensor. Give one example for each.

2. How a picture frame is scanned for TV transmission ? Explain the principle of such scanning technique. How does colour transmission differ from black-and-white transmission ? What are the basic components of a colour television receiver ?

2 + 3 + 2 + 3

3. (a) Draw the circuit diagram of a very high input impedance difference amplifier using 3 OP-AMPS and derive the expression for the output voltage.

- (b) Draw and explain the circuit diagram of an antilog amplifier using matched pair of transistors and derive the expression for the output voltage. 5 + 5
4. (a) Explain the operation of a triangular wave generator with proper circuit diagram and derive the expression for the frequency of the output signal.
- (b) Draw the circuit diagram of a 2nd order low pass Butterworth filter and derive the expression for the transfer function as a function of frequency. 5 + (1 + 4)
5. (a) What do you mean by a voltage controlled oscillator? Draw the circuit diagram of a voltage controlled oscillator and derive the expression for the output frequency.
- (b) Explain the operations of Chopper modulator and demodulator. (1 + 1 + 4) + 4

6. Describe the working of a switch mode power supply. What are its advantages? Design an astable multi vibrator with the help of a square wave generator and an integrator using OP-AMPs. Describe the working of the two blocks as well.  $3 + 2 + 2 + 2 + 1$