2011

M.Sc.

1st Semester Examination

ELECTRONICS

PAPER—ELC-104

Full Marks : 50

Time : 2 hours

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

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

Illustrate the answers wherever necessary.

Electronics (Analog Electronics)

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

1. Answer all questions : 2×5

a) Explain, with circuit diagram, how a bridge amplifier could be used as a transducer.

b) When a filter would be called a state variable filter?

c) Show the equivalent electrical circuit for piezoelectric crystal.

d) Mention the special features of a power transist

e) TV Communication differs from radio communicat — Discuss.

2. a) Show the circuit diagram of a differential ampli using OP AMP and explain its operation.

b) What do you mean by 'order' of a filter?

c) Design an active low pass 1st order Butterworth fil at a cut-off frequency of 5 KHz and a pass band g of 5. 4+2

3. a) Show the circuit diagram of a series regulator a explain its operation.

b) With the help of a neat circuit diagram, explain t operation of a square wave generator using OP AM Obtain an expression for the frequency of t generated wave. 4+4

4. a) Why harmonics would be produced in an amplifie What would be the effect of them?

b) Draw the circuit diagram of a single tuned amplif

and explain its operation.

Find out an expression for its output voltage.

(1+1)+2+2+4

5. a) Explain how synchronization between scanning at TV transmitter and receiver is obtained.

b) Name the basic components of a colour television receiver.

c) Draw the circuit diagram of a voltage regulator using OPAMP as a comparator and explain its operation. Derive expression for its output voltage.

3+1+(2+2+2)

6. a) Draw the block diagram of a PLL and describe its operation.

b) Draw the circuit diagram of voltage to frequency converter. Explain its operation. Show that the frequency of the output depends upon input voltage.

c) In an integrator circuit the time constant is 2 sec. The input is 2 Vdc. Find the output voltage and sketch it. (1+2)+(1+2+2)+2

Internal Assessment — 10