2011

M.Sc.

1st Semester Examination

ELECTRONICS

PAPER—ELC-106

(PRACTICAL)

Full Marks : 50

Time : 3 Hours

gures in the right-hand margin indicate full marks.

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

(*Electronic Circuit Lab*)

r any *one* question, selecting it by a lucky draw.

gn a regulated power supply using 78xx group ılator) and study its performance.

)ut Voltage = ...V, Output Current = ...mA.

Working formula. 4

)rawing of circuit diagram with labelling. 3

c) Implementation of the circuit on bread board.

d) Recording of data for load and line regulation characteristics (one set each). 5+

e) Drawing of graphs. 4+

f) Calculation of percentage regulation and stability factor. 2+

g) Discussion of the results obtained.

2. Design a regulated power supply of variable output usi LM317.

Output Voltage = ...V, Output Current = ...mA.

a) Working formula.

b) Circuit diagram with labelling.

c) Circuit Implementation on bread board.

d) Recording of data for load and line regulation characteristics (one set each). 5+

e) Drawing of graphs. 4+

f) Calculation of percentage regulation and stability factor. 2+

g) Discussion of the results obtained.

3. Design a regulated power supply using a power transistor as a pass element and an OPAMP as comparator.

Output Voltage = ...V, Output Current = ...mA.

a) Working formula. 4

b) Circuit diagram with labelling. 3

c) Design considerations and components to be used. 4

d) Circuit Implementation on a bread board. 4

e) Recording of data for load and line regulation characteristics (one set each). 4+4

f) Drawing of graphs. 3+3

g) Calculation of percentage regulation and stability factor. 2+2

h) Discussion of the results obtained. 2

4. Design a regulated power supply using power transistor as a pass element and another transistor as a comparator.

Output Voltage = ...V, Output Current = ...mA.

a) Working formula. 4

b) Circuit diagram with labelling. 3

c) Design considerations and components to be used. 4

d) Circuit Implementation on a bread board.

e) Recording of data for load and line regulation characteristics (one set each). 4+

f) Drawing of graphs. 3+

g) Calculation of percentage regulation and stability factor. 2+

h) Discussion of the results obtained.

5. Design a low-pass active Butterworth filter with a Rol off rate of 20dB/decade for cut-off frequency = 2 KHz ar pass band gain of 1 and study its performance.

a) Working formula.

b) Circuit diagram with labelling.

c) Design considerations for cut-off frequency and pass band gain.

d) Implementation of the circuit.

e) Recording of data for frequency response characteristics.

f) Drawing of graph.

g) Finding and comparison of Cut-off frequency and Roll-off rate with the supplied value.

$(2+1\frac{1}{2})+(2+1\frac{1}{2}$

h) Discussion of the results obtained.

6. Design a non-inverting active high-pass filter at a cut-off frequency of 3 KHz and pass band gain of 1 dB using only one R–C section (network) and study its performance.

   a) Working formula. 4

   b) Circuit diagram with labelling. 3

   c) Design considerations for cut-off frequency and gain. 4

   d) Implementation of the circuit. 3

   e) Recording of data for frequency response characteristics. 8

   f) Drawing of graph. 4

   g) Finding and comparison of the Cut-off frequency and Roll-off rate of it with the supplied value. $(2+1\frac{1}{2})+(2+1\frac{1}{2})$

   h) Discussion of the results obtained. 2

7. Design a second order active low-pass Butterworth filter and study its performance.

   a) Working formula. 4

   b) Circuit diagram with labelling. 3

   c) Design considerations for cut-off frequency = _____ Hz and gain = _____ dB. 5

d) Implementation of the circuit on a bread boar

e) Recording of data for frequency response characteristics.

f) Drawing of graph.

g) Finding and comparison of the Cut-off frequency and Roll-off rate of it with the supplied value. (2+1)+

h) Discussion of the results obtained.

8. Design a second order active high-pass (Butterw using two different R–C sections (Network) and stu performance.

a) Working formula.

b) Circuit diagram with labelling.

c) Design considerations for cut-off frequency = _____ KHz and pass band gain = _____ dB.

d) Implementation of the circuit on a bread boar

e) Recording of data for frequency response characteristics and drawing of graph.

f) Finding and comparison of the Cut-off frequency and the Roll-off rate of it

with the supplied value. (2+1)+(2+1)

g) Discussion of the results obtained. 2

9. Study the performance of a logarithmic amplifier using OPAMP.

a) Working formula. 4

b) Drawing of circuit diagram with labelling. 3

c) Circuit Implementation on bread board. 3

d) Recording of data by varying the input voltage at small steps. 10

e) Drawing of graphs. 4+4

f) Discussion about the nature of curves and the results obtained. 3

g) Comment on possible application of the circuit using the result obtained. 4

10. Study the performance of an antilogarithmic amplifier using OPAMP.

a) Working formula. 4

b) Drawing of circuit diagram with labelling. 3

c) Circuit Implementation on bread board. 3

d) Recording of data by varying the input voltage at small steps. 10

e) Drawing of graphs. 4+4

f) Discussion about the nature of curves and the results obtained. 3

g) Comment on possible application of the circuit. 4

Distribution of Marks

Laboratory note book	:	05 Marks
Viva Voce	:	10 Marks
Experiment	:	35 Marks
Total	:	50 Marks