

2007**ELECTRONICS****PAPER-III***Full Marks : 75**Time : 3 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.

Write the answers questions of each Group in separate books.

Answer 'Q.' No. 1 and any three from the rest in each group.

Group - A*(Marks : 40)*

1. (a) Discuss with block diagram how analog multiplication will be done using logarithmic & antilogarithmic amplifiers.
- (b) What is SMPS ? What are its differences from ordinary power supply unit ?
- (c) In what respects a colour television system differs from ordinary Television system ?
- (d) Name two applications of the Phase Locked Loop.
- (e) Why are the advantages of a crystal oscillator over other tuned oscillators ?

5x2

(Turn Over)

2. Give two basic characteristics of a Power Supply Unit. What do you mean by Series & Shunt Regulator? Compare between them. Draw the circuit Diagram, of a series regulator & explain its principle of operation. 2+2+1+5
3. Write down the advantages of active filter over passive filter? Draw the circuit diagram of an active lowpass 1st order Butter worth filter & explain its operation. Define the term roll of rate & cut off frequency for this case. 2+5+3
4. What do you mean by a regulated power supply? What is the difference between the monolithic voltage regulator chips 7906 and 7808? How can series regulation be achieved using an, OPAMP? What is the advantage of a Switched Mode Power Supply? 2+2+3+3
5. Differentiate between Class A, Class B and Class C amplifiers. Which is most efficient in power handling and why? What is cross-over distortion in a Class B amplifier? How can it be rectified? 3+3+2+2
6. Write short notes (*any two*) 5x2
- (a) VCO.
 - (b) TV Camera (Image Orthiem).
 - (c) Monolithic Voltage regulators.

Group - B*(Marks : 35)*

1. Reduce the Boolean functions : 1X5
- (a) $F=AB+AD+AB+C(A+D)+ABD$;
- (b) $F=B+AB+ACD+AC$;
- (c) $F=BCD+ABD+ABC+ABD+ACD$
- (d) $F=ABC+ABC+ABC+ABC$;
- (e) $F = m(1,2,5,6)$.
2. (a) Define Encoder: Explain octal to Binary Encoder with truth.. table and logic diagram. 1+4
- (b) Implement the following Boolean function by using MUX :
- $F(A, B, C, D) = Y_m(2,4,6,7,9,10,11,12,15)$
3. (a) Design a 5 x 32 decoder with four 3 x 8 decoders and a 2x4 decoder. 4
- (b) Design a combinational circuit that converts It decimal digit from the 8421 code to 2421 code. 6
4. (a) Design a full adder using 3 : 8 decoder. 3
- (b) Design a. BCD to Seven-Segment Code Converter. Draw the logic diagram. 7

5. (a) **Design a combinational circuit using a suitable ROM which accepts 3 bit binary number as i/P and generates an o/P which is square of i/P.**

(a) Design a combinational circuit using a suitable ROM which accepts 3 bit binary number as i/P and generates an o/P which is square of i/P.	5
(b) Explain R-2R ladder D/A converter.	5
6. Write short notes on (any two):	5x2

- (i) **Successive approximation type ADC.**
- (ii) **Characteristic of MOS logic.**
- (iii) **Shift register.**
- (iv) **Flip flop.**