

**3 (Sem-3) ELE M 1**

**2 0 1 7**

**ELECTRONICS**

**( Major )**

**Paper : 3-1**

**( Linear Active Circuits )**

*Full Marks : 60*

*Time : 3 hours*

*The figures in the margin indicate full marks  
for the questions*

1. Give objective-type answer to the following :

1×7=7

- (a) Define cutoff frequency of a filter.
- (b) What is CMRR of an OPAMP?
- (c) Give the mathematical expression of hybrid parameter  $h_{22}$ .
- (d) How can we define a distributed element of a circuit?
- (e) What is the advantage of class B amplifier over class A amplifier?
- (f) What is the internal impedance of an ideal current source?
- (g) Write down the full form of JFET.

8A/60

( Turn Over )



( 2 )

2. Give short answer of the following (any four) :  $2 \times 4 = 8$
- (a) Draw the circuit diagram of a push-pull amplifier.
  - (b) Define band elimination filter with its band diagram.
  - (c) Derive an expression for voltage gain of an instrumentation amplifier.
  - (d) Draw the circuit diagram of an analog adder.
  - (e) What are Barkhausen criteria?
  - (f) Define quality factor of a R-L network.
3. Write short notes on any three of the following :  $5 \times 3 = 15$
- (a) MOSFET
  - (b) Voltage controlled oscillator
  - (c) Hybrid pi model of C-E amplifier in voltage divider configuration
  - (d) Hartley oscillator
  - (e) Class AB power amplifier

( 3 )

4. Answer any three of the following :  $10 \times 3 = 30$
- (a) Explain the working principle of a JFET with necessary diagram.
  - (b) Draw the circuit diagram of an emitter follower and derive an expression for its voltage gain.
  - (c) Discuss in detail about Schmitt trigger with necessary circuit diagram.
  - (d) Write short notes on the following :
    - (i) Wien bridge oscillator
    - (ii) Gyrator

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