

OCTOBER 2007, APPLIED ELECTRONICS, PAPER 1

Ques 1 (A): Select correct alternative and rewrite the following sub question – (4 Marks)

- a) For half wave rectifier using practical diodes, output voltage is _____
- (i) $V_m - \text{Diode drop}$ (ii) $2V_m - \text{Diode drop}$ (iii) $2V_m \times \text{Diode drop}$ (iv) $V_m + \text{Diode drop}$
- b) A non-inverting amplifier uses _____ feedback.
- (i) Positive (ii) Negative (iii) Both +ve & -ve (iv) None of the above
- c) In _____ type of LAN configuration, if one station fails, the whole system fails.
- (i) Star (ii) Ring (iii) Bus (iv) Tree
- d) Capacitive transducer is _____ transducer.
- (i) Displacement (ii) Self generating (iii) Negative resistance (iv) Light

Ques 1 (B): Attempt any TWO of the following – (6 Marks)

- a) What is a Time-base signal? Explain its necessity in a CRO.
- b) Explain the working of an optocoupler with a neat diagram
- c) Define for an op-Amp :
- i) Common –mode gain ii) Input offset voltage iii) Bandwidth.

Ques 2 (A): Attempt any TWO of the following – (6 Marks)

- a) With neat circuit diagram, explain the working of a IC 555 monostable multivibrator.
- b) Differentiate between AM and FM. (six points)
- c) State any six Ideal op-amp characteristics.

Ques 2 (B): Attempt any ONE of the following – (4 Marks)

- a) Draw a neat block diagram of CRO and explain in brief, the function of each block.
- b) Draw and explain functional block diagram of three terminal IC voltage regulator.

Ques 3 (A): Attempt any TWO of the following – (6 Marks)

- a) Explain the working of LVDT with neat diagram.
- b) Find the output voltage of an op-amp integrator after 10 seconds, its input voltage is 1V and $R_1 = 10\text{k}\Omega$, $C = 10\mu\text{F}$.
- c) An audio signal is given by $E_m = 60 \sin 3000t$. Its amplitude modulates a carrier wave given by $E_c = 120 \sin 60000t$. Find the audio frequency, carrier frequency and modulation factor.

Ques 3 (B): Attempt any ONE of the following – (4 Marks)

- a) With neat block diagram, explain digital multimeter.
- b) Explain with neat circuit diagram, how overload and short circuit protection is achieved in a transistorized series regulator.

Ques 4 (A): Attempt any TWO of the following – (6 Marks)

- a) Draw a neat block diagram of a regulated power supply and explain the function of each block.
- b) List three applications of satellite and explain any one in brief.
- c) Explain with neat circuit diagram, how frequency shift keying is obtained using IC 555.

Ques 4 (B): Attempt any ONE of the following – (4 Marks)

- a) Explain with neat circuit diagram, op. amp. As an inverting adder.
- b) Explain the working of a FAX transceiver with the help of a block diagram.

Ques 5 (A): Attempt any TWO of the following – (6 Marks)

- a) Explain the working of SMPS with proper circuit diagram.
- b) Explain with neat circuit diagram, working of an Op-amp comparator.
- c) How CRO displays waveform? Explain with neat diagram.

Ques 5 (B): Attempt any ONE of the following – (4 Marks)

- a) Draw the block diagram of a transponder in a satellite and explain it.
- b) Explain the working of an Op-amp Schmitt Trigger with neat circuit diagram.

OR

Ques 5 (A): Attempt any TWO of the following – (6 Marks)

- a) Explain the construction and working of a loudspeaker with neat diagram.
- b) Explain the importance of modulation index in AM.
- c) Draw the frequency response curve of an op-amp. And explain it.

Ques 5 (B): Attempt any ONE of the following – (4 Marks)

- a) Explain any two applications of CRO.
- b) Compare Half wave rectifier and centre-tapped full wave rectifier. (4 points)
