

OCTOBER 2006, APPLIED ELECTRONICS, PAPER 1

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

- a) _____ stage of operational amplifier rejects the noise signal.
- (i) Level shifter (ii) Differential amplifier (iii) Emitter follower (iv) Output
- b) In amplitude modulation useful power is carried by _____.
- (i) Carrier signal (ii) Modulating signal (iii) Side bands (iv) None of the above
- c) Output frequency of astable multivibrator using IC555 is independent of _____.
- (i) Resistance RA (ii) Resistance RB (iii) Timing capacitor (iv) Supply voltage
- d) In series pass regulator, when voltage across load resistance decreases, current through series pass transistor will _____.
- (i) Increases (ii) Decrease (iii) Remain same (iv) None of these

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

- a) Draw neat diagram of piezo electric transducer. Write its working principle and one application.
- b) Write the working principles of pulsed RADAR and continuous wave RADAR.
- c) Draw frequency response curve of an Op. Amp. And hence explain the cut-off frequency and unity gain frequency.

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

- a) Write the function of each of the following controls of CRO: power on, intensity, focus, volt/div, time/div, EXT/INT.
- b) Draw functional block diagram of three pin IC regulator and explain its working.
- c) Define following terms related to opamp: input offset current, input bias current, slew rate.

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

- a) With neat circuit diagram and derivation for output, explain opamp as subtractor.
- b) List methods of scanning used in FAX and explain anyone of them.

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

- a) With neat circuit diagram explain working of monostable multivibrator using IC 555. Write the equation of determine time period.
- b) For non-inverting opamp has input resistance $3.3k\Omega$ and feedback resistance $33k\Omega$. Calculate the output voltage if input voltage is $0.5\mu V$. Draw circuit connection for same using IC741.
- c) Draw and explain resistance temperature characteristics of thermister.

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

- a) Draw neat block diagram of function generator and explain function of each block.
- b) With neat circuit diagram explain how regulation is obtained in series pass transistorized voltage regulator.

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

- a) Compare half wave and Bridge rectifier. Explain any six points.
- b) Explain the working of adjustable voltage regulator using IC LM317. Show circuit connections.
- c) State advantages and disadvantages of fiber optic cables over conventional electric cables. Explain any three points.

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

- a) Define following terms for power supply: line regulation, load regulation, ripple rejection, rectification efficiency.
- b) Draw block diagram of an opamp and explain function of each block.

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

- a) The FM signal has resting frequency of 110MHz and the highest frequency of 110.10MHz when modulated by 10 kHz. Thus, determine frequency deviation, carrier swing, modulation index.
- b) With neat circuit diagram and input output waveforms, explain working of RC filter.
- c) Explain the use of CRO to measure AC and DC voltages.

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

- a) Draw block diagram of FSK modem and explain function of each block.
- b) Explain the working of LVDT as transducer. Draw neat diagram. State its two applications.

OR

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

- a) The turns ratio of transformer in a bridge rectifier is 10:1. The primary is connected to 220V, 50Hz AC mains voltage. Find the output DC voltage under no load condition; assume that the diodes used in the circuit are ideal diodes.
- b) Draw circuit diagram of an opamp as integrator and derive expression for its output.
- c) What is modulation? State the necessity of modulation.

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

- a) Draw the block diagram of CRO and explain function of each block.
- b) Explain following terms for opamp: virtual ground, CMRR.
