OCTOBER 2008, APPLIED ELECTRONICS, PAPER 1

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

a) In CRT _____ anode has variable positive voltage.

(i) Pre-accelerating (ii) Focusing (iii) Accelerating (iv) Control Grid

b) For bridge rectifier current rating of diode is equal to _____

(i) Idc (ii) Idc (iii) Idc (iv) None of the above

c) The output impedance of an ideal OP-AMP is _____

(i) Infinite (ii) Zero (iii) 57Ω (iv) 75Ω

d) _____ network configuration has fastest speed.

(i) Star (ii) Bus (iii) Ring (iv) All

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

a) List the types of filters used in power supply. Explain the working of anyone type in detail.
b) In OP-AMP inverting amplifier feedback resistor of 10kΩ is used. Find the input resistance to get 10 times input at output. Draw its circuit diagram.
c) Define Amplitude, Frequency and Phase Modulation.

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

a) Explain the working of Time-base Generator using UJT. Draw the Waveform and state the equation of its frequency.
b) Explain with the help of circuit diagram, how Zener Diode is used as voltage regulator?
c) Draw the symbol of Operational Amplifier and show the pin connections of IC 741.

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

a) What is the principle of LVDT? Explain its construction and write it's working.
b) Explain in details how OP-AMP is used as Schmitt Trigger. Draw circuit diagram and its transfer characteristic.

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

a) Enlist the application of CRO. Explain anyone in detail.
b) In a centre tapped full wave rectifier secondary voltage is 6V AC. Using ideal diodes, calculate the dc load voltage, load current, if load resistance of 54Ω is connected.
c) State any six ideal characteristics of OP-AMP.

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

a) Define for FM.
   i) Frequency Deviation ii) Modulation Index
   iii) Deviation Ratio iv) Percentage Modulation
b) Draw the block diagram of Operational Amplifier and explain its working.

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

a) Explain the factors considered for selection of a Transducer.
b) Draw the labeled circuit diagrams of OP-AMP as Integrator and Differentiator, State their output equations.
c) In AM, carrier voltage increases to 150V and reduces to 30V due to modulating signal. Calculate Modulation Index.

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

a) Draw the functional block diagram of DMM and explain its working.
b) Write basis idea of Switched Mode Power Supply (SMPS). State its advantages. (any four)

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

a) Explain working of optocoupler using diagram.
b) Explain the working of monostable multivibrator using IC555. Draw its circuit diagram.
c) In an inverting adder, if R_1 = 2kΩ, R_2 = 10kΩ and R_3 = 5kΩ with V_1 = 2V, V_2 = –4V and V_3 = 5V, then calculate the output voltage if Rf = 10kΩ.

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

a) Explain the working of transistorized series regulator using its circuit diagram.
b) Draw the block diagram of fiber optic communication System. Explain its working.

OR

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

a) Explain the working of FSK using IC 555. Draw its circuit diagram.
b) Define for opamp: slew rate, CMRR, input bias current.
c) State and explain any three characteristics of Power Supply.

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

a) Draw block diagram of Function Generator and describe function of each block in brief.
b) With the help of block diagram, explain cellular radio system.