

Sub: EEX  
Course: F.Y.E.J.  
Marks: 100

Date: 12/ 03/ 2014  
Time: 3 Hrs.

Q1. (A) Answer any TEN

(20 Marks)

- State the Faraday's laws of electromagnetic induction. Also write its formula.
  - Draw the neat labeled sketch of slug tuned inductor. State two functions of it.
  - Define the term 'Effective series Resistance' with respect to capacitance.
  - Draw the circuit diagram of bridge rectifier and label it.
  - Draw the circuit diagram of Centre tapped rectifier with  $\pi$  filter and label it.
  - Draw the ideal current source and practical current source.
  - State the Kirchoff's voltage law along with its formula.
  - Calculate the supply voltage of the circuit.
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- Write the four applications for zener diode.
  - Explain with the neat sketch construction of PIN diode.
  - State the condition for integration with reference to RC integrator with neat circuit diagram.
  - Draw the circuit diagram of shunt negative clipper with input and output waveforms.

Q2. Answer any FOUR

(16 Marks)

- Describe the working of LDR with neat sketch. List its two applications.
- Draw the characteristics of linear and logarithmic potentiometers. Write four specification of potentiometer.
- Draw the constructional diagram of electrolytic capacitor. Explain the working.
- List the two specification of capacitor and two dielectric materials used in capacitors.
- Draw the constructional diagram of iron core inductor and ferrite core inductor.
- Describe the working of PN- junction diode with neat sketch under forward bias condition.

Q3. Answer any FOUR

(16 Marks)

- Enlist the four specifications of zener diode.
- Describe construction of tunnel diode with neat sketch. List its two applications.
- Describe the operating principle of LASER diode with neat sketch.
- Draw the symbol of schottky diode. With neat sketch explain its principle of working.
- List different types of filters. Which filter is practically preferred to get pure DC output voltage? Why?
- State the values of following parameters with reference to half wave rectifier.

(i)Ripple Factor (ii) Efficiency (iii) TUF (iv) Average value of DC output voltage

Q4. Answer any FOUR

(16 Marks)

- Draw the circuit diagram of full wave bridge rectifier with LC filter. Explain with input and output waveforms.

- b) b) Using colour code, write the colour code for the following resistors:
  - (i) 560 K $\pm$  5%    (ii) 23.4 K $\pm$  10%
- c) Draw the circuit diagram of series inductor filter with half wave rectifier. Explain it with input and output waveforms.
- d) In FWR  $V_m = 10$  V,  $R_L = 10$  K $\Omega$ . Calculate  $V_{dc}$ ,  $I_{dc}$  and ripple factor. Refer the following figure.

- e) Compare the PN junction diode and Zener diode. (Four points)
- f) Compare LED and photodiode. (Four Points)

**Q5. Answer any FOUR**

**(16 Marks)**

- a) What do you mean by the term wave shaping circuit? Explain why it is needed in practical applications?
- b) Describe the working principle of RC differentiator with neat sketch. State the condition for differentiator?
- c) Describe the working of positive clipper with neat circuit diagram and input/ output waveforms.
- d) Draw the circuit diagram of RC integrator. Draw the input and output waveforms of RC integrator for square wave and triangular as input.
- e) State the super position theorem with suitable example.
- f) State the Theveni's theorem with suitable example.

**Q6. Answer any FOUR**

**(16 Marks)**

- a) Draw the circuit diagram for negative and positive voltage clamping circuits. Show the input and output waveforms.
- b) Compare Clipper and Clamper.
- c) Explain the following terms
  - (i) Active Network      (iii) Linear Network
  - (ii) Unilateral Network    (iv) Bilateral Network
- d) Calculate the value of current in 5 $\Omega$  Resistor using Norton's theorem for the network shown in figure.

- e) Calculate the value of  $R_L$  so that power transferred will maximum in the circuit shown in figure.

- f) Write the meaning term open circuit and short circuit with neat diagram.