

(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 1230**

Roll No.

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## B. Tech.

(Semester-II) Even Semester Theory Examination, 2012-13

### ELECTRONICS ENGINEERING

Time : 3 Hours]

[Total Marks : 100

Note : Attempt questions from each Section as per instructions.

#### SECTION - A

Attempt *all* parts of this question. Each part carries 2 marks.

2×10 = 20

1. (a) Compare the properties of Si and Ge semiconductors.
- (b) Define depletion layer in a diode.
- (c) Define bulk resistance of the diode.
- (d) Draw the double ended diode clipper circuit.
- (e) Draw the output waveform appear across  $R_L$  for the Fig. 1.

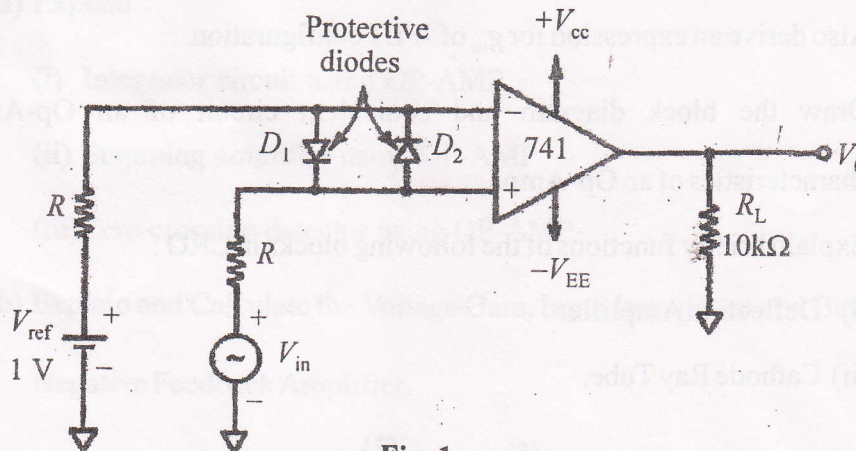


Fig. 1

(1)

P. T. O.

(f) A constant voltage source with 10 V and series internal resistance of 100 ohm.

Calculate its equivalent current source.

(g) Define Ohmic region in FET.

(h) If  $\alpha$  of a transistor changes from 0.981 to 0.987, find the percentage change in  $\beta$ ?

(i) Why triggering circuit is needed in CRO ?

(j) List the four specifications of unregulated power supply.

### SECTION-B

Attempt any *three* parts of this question. Each part carries 10 marks.

10×3=30

2. (a) (i) For a half wave rectifier derive an expression for ripple factor.

(ii) Explain the function of the circuit of Fig. 2 and draw the output waveform.

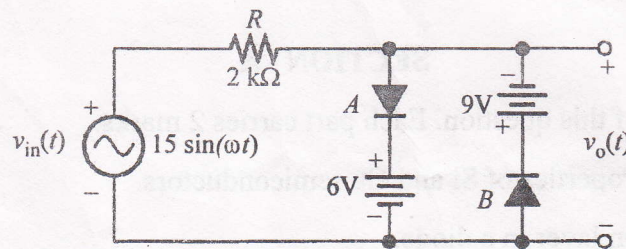


Fig. 2

(b) Draw the CE configuration circuit of BJT and explain its input and output characteristics.

(c) Describe the working operation of enhancement mode and depletion mode MOSFET.

Also derive an expression for  $g_m$  of JFET configuration.

(d) Draw the block diagram and equivalent circuit of an Op-Amp. Explain ideal characteristics of an Op-Amp.

(e) Explain briefly functions of the following blocks in CRO :

(i) Deflection Amplifier

(ii) Cathode Ray Tube.

## SECTION-C

Attempt *all* questions of this Section. Each question carries 10 marks.

10×5=50

3. Explain input and output characteristics of any two of the following :
- (a) Schottky Diode
  - (b) Zener Diode
  - (c) Varactor Diode
4. Attempt any two parts :
- (a) Explain the working of a common base circuit with its circuit diagram.
  - (b) What is a well-designed voltage divider biasing (VDB) circuit ? Explain.
  - (c) Explain, how the input impedance of an amplifier can load down the a.c. source.
5. Attempt any two parts :
- (a) Explain the transconductance curve of a JFET.
  - (b) Draw the schematic of Self-Biasing JFET amplifier.
  - (c) Explain the CMOS inverter circuit working operation.
6. Attempt any one part :
- (a) Explain :
    - (i) Integrator circuit using OP-AMP.
    - (ii) Summing amplifier using OP-AMP
    - (iii) Zero crossing detector using OP-AMP.
  - (b) Explain and Calculate the Voltage Gain, Input Impedance and Bandwidth for an Inverting Negative Feedback Amplifier.

7. Attempt any two parts :

- (a) Explain the characteristics of Digital Voltmeter Systems.
- (b) Explain all Oscilloscope Controls with one example.
- (c) How do you measure power supply performance? Explain.