

RGPVONLINE.COM**EE - 304****B.E. III Semester**

Examination, December 2015

Semiconductor Devices and Circuits*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
 ii) All parts of each questions are to be attempted at one place.
 iii) All questions carry equal marks, out of which part A and B (Max.50 words) carry 2 marks, part C (Max.100 words) carry 3 marks, part D (Max.400 words) carry 7 marks.
 iv) Except numericals, Derivation, Design and Drawing etc.

UNIT - I

1. a) Why FET is called a voltage controlled device?
- b) Why is zener diode is used as a voltage regulator?
- c) List the advantage and disadvantage of FET over BJT.
- d) Draw the diagram of MOSFET and explain its working with its characteristics.

OR

Draw the diagram of photodiode and explain its working with its characteristics.

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2. a) Define thermal run away.
- b) Write the limitation of h-parameters.
- c) Draw the h-parameter equivalent diagram of CE.

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- d) A BJT has the following parameters $h_{ie}=2000\Omega$, $h_{re}=16\times 10^{-5}$, $h_{fe}=49$ and $h_{oe}=50\mu A/V$. Determine the current gain voltage gain, input resistance and output resistance of the CE amplifier, if the load resistance is $30k\Omega$ neglect source resistance.

OR

Find out the h-parameter of CC and draw its equivalent h-parameter circuit diagram.

UNIT - III

3. a) What are different types of feedback?
- b) Why is negative feedback employed in high gain amplifier?
- c) Explain emitter follower with circuit diagram.
- d) Draw the circuit diagram of push pull amplifier. Explain its working.

OR

Explain L-C (Hartley-Colpitts) oscillators with neat sketch diagram.

UNIT - IV

4. a) Explain the working of transistor as a switch.
- b) Define CMRR and slew rate.
- c) Define Darlington pair with diagram.
- d) Draw the circuit of monostable and explain its working.

OR

Draw the circuit diagram of multivibrator and explain its working.

UNIT - V

5. a) Explain how an op-amp can be used as voltage follower.
- b) Distinguish between inverting and non-inverting amplifier.
- c) Explain Integrator in brief.
- d) Explain differential amplifier with diagram.

OR

What do you mean by 555 timer and explain bipolar operation of 555 timer?
