EX - 304

B.E. III Semester Examination, December 2014
### Electronic Devices and Circuits - I
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.

1. a) Define diffusion capacitance and transition capacitance.

    b) What is meant by LED? What materials are used to construct an LED.

    c) Explain construction of PIN diode.

    d) Explain the zener and Avalanche effects give differences between them.

<div align="center">OR</div>

Determine the current through resistance 'R' in each circuit. Diodes D_1 and D_2 are identical and ideal.
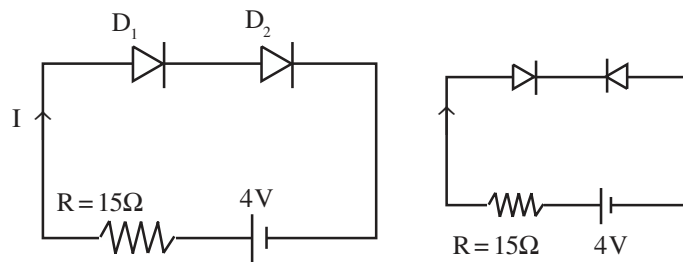
2. a) Why is base made thin in BJT?

    b) What is meant by punch through effect in BJT?

    c) What are the differences between BJT and JFET.

    d) Explain with the help of neat diagram, the structure of an N-channel FET and its volt ampere characteristics.

<div align="center">OR</div>

Draw and explain the input and output characteristics of a transistor in CE configuration.

3. a) What is meant by biasing a transistor?

    b) For a transistor working as a Common Base amplifier current gain is 0.96, $I_E = 7.2$ mA. Calculate base current I_B.

    c) Prove that in a transistor operating in CE configuration the active region, collector current I_C is given by $I_C = \beta I_B + (\beta + 1)I_{CO}$.

d) Explain a Darlington Amplifier circuit.

OR

What is a RC coupled amplifier.

4. a) What are the types of feedback amplifiers.

b) What type of input connection should be used to have a large input impedance.

c) State and explain Barkhausen criterion for oscillator.

d) Explain with current diagram a negative feedback amplifier and obtain an expression for its closed loop gain.

OR

Draw the circuit of RC phase shift oscillator and explain its working. Derive the expression for frequency of oscillations.

5. a) Compare the efficiency of class A, B, C, AB.

b) What is figure of merit in a power amplifier.

c) What is crossover distortion and how to minimize it.

d) Draw and explain a class B power amplifier.

OR

Define a amplifiers :

a) Class A

b) Class B

c) Class AB

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