

[Total No. of Questions - 9] [Total No. of Printed Pages - 2]
(2125)

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B. Tech 1st / 2nd Semester Examination

Basic Electronics (OS)

EC-1001

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, by selecting one question from each of the Section A, B, C & D and all questions in Section-E are compulsory.

SECTION - A

1. What is a junction diode? Explain the working of a p-n junction diode under forward and reverse biasing. Draw current-voltage characteristic curve for junction diode and explain the phenomenon of avalanche breakdown. (20)
2. Explain giving circuit diagram the working of full wave rectifier. Obtain expressions for average and RMS values of current and efficiency. (20)

SECTION - B

3. (a) Define current gain for common base and common emitter configuration in a transistor. Establish a relation between them.
(b) Draw the structure of an N-channel depletion type MOSFET. Explain how the depletion region is formed in the channel. (10+10=20)
4. (a) What do you mean by biasing of transistor? Discuss different methods for transistor biasing.
(b) Discuss two port network analysis. (10+10=20)

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2

15030

SECTION - C

5. What do you understand by the term feedback in amplifier? Draw the neat diagram of a negative feedback amplifier and discuss its advantages and disadvantages. (20)
6. Describe the working of an R-C coupled amplifier and explain its frequency response curve. Also obtain an expression for the voltage gain in mid-frequency range. (20)

SECTION - D

7. Explain different process involved in the fabrication of monolithic integrated circuit. (20)
8. Describe how operational amplifier (OP-AMP) can be used as a comparator and differentiator. (20)

SECTION - E

9. Attempt all parts:
 - (a) What is band gap energy?
 - (b) How electron and hole concentrations in semiconductor vary with increasing temperature?
 - (c) Draw a non inverting amplifier using an OP-AMP.
 - (d) On which principle, a field effect transistor operates?
 - (e) What are three sets of parameters used to analyse a transistor circuit?
 - (f) What is the peak inverse voltage for full wave rectifier?
 - (g) What is a voltage amplifier?
 - (h) What are the four basic types of coupling amplifiers?
 - (i) What are the active and passive elements in integrated circuits?
 - (j) What are the characteristics of ideal OP-AMP? (10×2=20)