

**C 26888**

(Pages : 2)

Name.....

Reg. No.....

**FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION  
MARCH/APRIL 2012**

**EC 09-405/PTEC 09 404—COMPUTER ORGANIZATION AND ARCHITECTURE  
(2009 Admissions)**

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

1. Registers R1 and R2 of a computer contain the decimal values 1200 and 4600. What is the effective address of the memory operand in each of the following instructions ?
  - (a) Load 20(R1), R5.
  - (b) Add → (R2), R5.
2. What are the most common fields found in an instruction format ?
3. Define Memory Density and Memory Access time.
4. What is an Interrupt ?
5. What is a stack ?

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. Briefly explain the *four* methods of control organization.
7. Write a note on Multilevel Memories.
8. Explain the shared Bus system.
9. Write a note on Virtual and Cache Memories.
10. Explain Parallel Processing.
11. With a suitable example, explain the Subroutine.

(4 × 5 = 20 marks)

**Turn over**

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FOURTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION  
MAY 2012

EC 09 406/PTEC 09 405—SOLID STATE DEVICES

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Short answer questions.*

1. What is the significance of Fermi-Dirac function ?
2. What is avalanche breakdown ?
3. Why is BJT called current controlled device ?
4. What is kirk effect ?
5. What is strong inversion in MOSFET ?

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. Derive the expression for charge concentrations of semiconductor doped with pentavalent impurity.
7. Derive the expression for drift current in semiconductors.
8. Derive the expression for built in potential of a graded PN junction.
9. With circuit diagram explain and write the expressions for terminal currents of *p-n-p* BJT.
10. Explain the short-channel effects in MOSFET.
11. Explain the concept of threshold voltage in N-MOSFET and P-MOSFET.

(4 × 5 = 20 marks)

**Part C**

12. (a) Derive the continuity equation.

*Or*

- (b) Derive the expression for Fermi-level in intrinsic semiconductor.

13. (a) Explain Schottky effect and derive an expression for change in potential barrier due to image charge and applied bias voltage.

*Or*

- (b) Draw the structure of GaAs isotope diodes and explain its characteristics.

14. (a) Draw the Eber-Moll model for BJT and write the analytical expressions for transistor characteristics.

*Or*

- (b) Draw the structure of JFET and explain its operation.

15. (a) Explain the working and characteristics of *n*-channel, depletion MOSFET with diagrams.

*Or*

- (b) Explain the working of floating gate MOSFET with diagram.

(4 × 10 = 40 marks)