



Reg. No. : .....

Name : .....

**IV Semester B.Tech. (Reg./Sup./Imp. including Part Time)  
Degree Examination, June 2011  
(2007 Admn.)**

**PT2K6/2K6 EE/EC/AEI 402 – COMPUTER PROGRAMMING**

Time: 3 Hours

Max. Marks: 100

*Instruction: Answer all.*

- I. 1) Explain briefly the logical and arithmetic operators and give their precedence. 5  
2) Differentiate between break and continue. 5  
3) Explain any two string library functions with example. 5  
4) How matrix (2D array) and 1D array initialization is done ? Show an example. 5  
5) What is data abstraction and encapsulation ? 5  
6) What are constructors and destructors ? Give example. 5  
7) How applets differ from applications ? 5  
8) Explain 5 most commonly used string methods in Java. 5
- II. A) 1) Give syntax and usage of for and while loops. 8  
2) Write a C program to calculate  ${}^n C_r = \frac{n!}{(n-r)!r!}$  and  ${}^n P_r = \frac{n!}{(n-r)!}$  using functions. 7  
OR  
B) 1) What is recursion ? Explain with example 2 types of parameter passing in functions. 9  
2) Write a C program to implement a simple calculator. 6
- III. A) 1) Explain 3 dynamic memory allocation functions. What is singly linked list and doubly linked list ? 9  
2) WAP to input 100 student details as structures and display them. Structure fields (Reg. No, name, branch, sem, marks 1, marks 2, marks 3). 6  
OR  
B) 1) Explain various bitwise operators available in C with example. 8  
2) Write a program to do linear search on an array of elements. Display if found or not found, if found display position also. 7

P.T.O.



- IV. A) 1) Explain how type conversions in expressions is done in Java. **8**  
2) Write a program to create 3 rectangles and calculate the areas and display using constructors. **7**

OR

- B) 1) What are the rules to be followed while declaring variables in Java ? **8**  
2) What is inheritance ? Write a program to show how single inheritance could be achieved. **7**

- V. A) 1) Explain the life cycle of an applet. **6**  
2) Write an applet to display Hello message and embed it in a web page. How applets differ from applications ? **9**

OR

- B) 1) Which are the various byte stream classes in Java for input and output ? **8**  
2) Write a program to write bytes into a file. **7**
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**PT2K6/2K6EE403 : MICROPROCESSORS AND MICROCONTROLLERS**

Time : 3 Hours

Max. Marks : 100

- I. a) Explain different addressing modes of 8085.  
b) Explain the concept of memory segmentation in 8086 and its advantages.  
c) Explain different keyboard modes of 8279.  
d) Explain the control word format and operating modes of 8253 programmable timer.  
e) List different data types supported by 80386 microprocessor.  
f) Explain the branch prediction features of pentium processor.  
g) Explain the port 0 and port 1 pin circuit with a neat diagram for 8051 microcontroller.  
h) Explain different interrupt signals available in 8051 and also give the priority levels for each. (8×5=40)

- II. a) i) Explain a method for latching low-order address bus of 8085. Also give the details of different flags available in 8085. 8  
ii) Explain different machine language instruction formats of 8086. 7

OR

- b) i) Explain the maximum mode configuration of 8086 system and timings. 8  
ii) Explain the hardware and software interrupts available in 8085. 7

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- III. a) i) Explain control word and different modes of operation of 8255 PPI. 8
- ii) Explain the internal architecture of 8251 programmable communication interface. 7

OR

- b) i) Give the details of mode word, command word and status word format of 8251 PCI. 7
- ii) Explain the architecture of 8257 DMA controller with the help of neat block diagram. 8

- IV. a) i) Explain the structure of an 80386 descriptor. 7
- ii) Using a block diagram explain the pentium CPU architecture and also explain super scalar organization. 8

OR

- b) i) Explain the salient features and register organization of 80486. 8
- ii) Explain the paging mechanism of 80386. 7

- V. a) i) Explain the architecture of 8051 microcontrol. 8
- ii) Explain the software time delay generations and hardware delay generation. 7

OR

- b) i) Explain the architecture of 80196 microcontroller. 8
  - ii) Explain the byte level and bit level logical operation of 8051 microcontroller. 7
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**IV Semester B.Tech. (Reg./Sup./Imp. – Including Part Time) Degree Examination, June 2011 (2007 Admn.)**

**PT2K6/2K6 EE404 : PULSE AND DIGITAL ELECTRONICS**

Time : 3 Hours

Max. Marks : 100

*Instruction : Answer all questions.*

- I. 1) Explain with neat sketch the switching behavior of transistors. 5
  - 2) Explain different types of diodes and its characteristics. 5
  - 3) Compare regenerative comparator and conventional comparators. 5
  - 4) Explain a ramp generator circuit using op-amp. 5
  - 5) Design EX-OR gate using :
    - i) Only NAND 5
    - ii) Only NOR. 5
  - 6) Design a combinational circuit to multiply two 2-bit numbers. 5
  - 7) Define :
    - i) Set-up time 5
    - ii) Hold time 5
    - iii) Propagation delay. 5
  - 8) Explain race around condition. 5
- II. 9) a) The input wave in the Fig. 9(a) is a 200 kHz square wave with 6 V high level and 0V low level. The transistor parameters are  $\beta_{min} = 70$ ,  $C_{Te} = 4$  PF,  $C_c = 7$  PF,  $r_{bb} = 30 \Omega$ ,  $\tau_s = 350$  ns and  $f_T = 7.5$  MHz. Find all the components of switch-off delay and switch-on delay of the transistor and draw the o/p voltage waveform showing the various switching delay components. 8

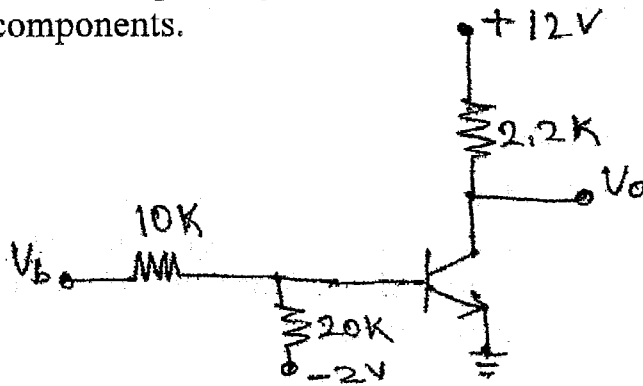


Fig. 9(a)



- b) Explain with neat sketch, Miller Sweep using op-amp. 7
- OR
- c) Give a brief note on Schottky BJT's. 3
- d) With neat circuit explain collector coupled astable circuit. 7
- e) Draw the current sweep generation circuit and explain its operation. 5
- III. 10. a) Explain an inverting type and non-inverting type precision half wave rectifier with neat circuit diagrams and waveforms. 10
- b) Explain the principle of PLL's. 5
- OR
- c) Design an op-amp Schmitt trigger circuit with  $LTP = 2V$ ,  $UTP = 4V$  and  $V_{sat} = V_{o(max)} = \pm 10 V$ . 8
- d) Explain a 555 timer as a voltage controlled oscillator. 7
- IV. 11. a) Perform the 2's complement subtraction on :  
 i)  $1100_{(2)} - 1111_{(2)}$       ii)  $0110_{(2)} - 0010_{(2)}$ . 5
- b) Design a Gray-Binary code converter using 4 : 1 MUX. 10
- OR
- c) Realize a 5 : 32 decoder, using 2 : 4 decoder. 7
- d) Design a 2-bit comparator using logic gates. 8
- V. 12. a) Compare synchronous and asynchronous counters. 4
- b) Design a Mod-12 asynchronous counter. 6
- c) Explain a switch tail counter. 5
- OR
- d) Explain a general ASM model. 5
- e) A network produces a '1' output if and only if the current i/p and the previous three i/p's correspond to either of the sequences 0110 or 1001. The o/p '1' is to occur at the time of the fourth i/p of the recognised sequence. Outputs of zero are to be produced at all other times. Construct the state diagram. 10



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**IV Semester B.Tech. (Reg./Sup./ Imp. – including Part Time) Degree  
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**PT2K6/2K6EE 405 : ELECTRICAL MACHINES – I**

Time : 3 Hours

Max. Marks : 100

*Instruction : Answer all questions.*

- I. a) Differentiate between lap and wave winding.  
b) Obtain an equation for torque developed in a winding.  
c) Explain power flow diagram of d.c. generator.  
d) Define :  
    i) Critical field resistance  
    ii) Critical speed of a d.c. generator  
e) Explain flux control method for the speed control of d.c. shunt motor.  
f) What are the advantages and disadvantages of Hopkinson test ?  
g) What is an ideal transformer ?  
h) Explain oil natural cooling of transformers. (8×5=40)
- II. a) Define the following terms with reference to armature winding of d.c. machines : **8**  
    i) Pole pitch                      ii) Back pitch  
    iii) Commutator pitch and    iv) Front pitch

P.T.O.



b) A 250 V, 14.9 kW, 8 pole d.c. motor has single turn coil. The armature is wave wound with 94 commutator segments. If the brushes are gives a lead of 2 commutator segments at full load, calculate : 7

i) Total armature reaction ampere-turns

ii) Cross magnetising ampere-turns

Assume an efficiency of 80%.

OR

c) Explain the concept of armature reaction in a d.c. generator with neat diagrams. 9

d) Find the number of turns required on each commutating pole of a 5 kW, 230 V, 4 pole separately excited d.c. generator having a wave connected armature with 564 conductors. The flux density in the commutating pole air gap is 0.15 wb/m<sup>2</sup> at full load and length of gap is 0.25 cm. Neglect the ampere-turns required for iron parts of the commutation pole magnetic circuit. 6

III. a) Explain the procedure to maintain the constant voltage across shunt generator. 6

b) A shunt generator gave the following results in the OCC test at a speed of 800 rpm.

$I_f$ (A)	:	1	2	3	4	6	8	10
Emf (V)	:	90	185	251	290	324	345	360

The field resistance is adjusted to 50  $\Omega$  and the terminal voltage is 300 V. Armature resistance is 0.1  $\Omega$  and assuming that flux is reduced by 5% due to armature reaction. Find the load supplied by the generator. 9

OR

c) List the applications of shunt and series generators. 6

d) Two shunt generators operating in parallel deliver a total current of 250 A. One of the generators is rated 50 kW and other 100 kW. The voltage rating of both machines is 500 V and have regulation of 6% and 4% respectively. Assuming linear characteristic determine : (i) Current delivered by each machine (ii) Terminal voltage. 9



- IV. a) Explain : 6
- i)  $T_a$  Vs  $I_a$  ii)  $N$  Vs  $I_a$  characteristics of a D.C. series motor.
- b) A 250 V separately excited d.c. motor has an armature resistance of  $2.5 \Omega$ . When driving a constant load at 600 rpm the armature takes 20A. The motor is controlled by a chopper with a chopping frequency of 400 Hz. The input voltage to chopper is 250V. What would be the value of duty ratio, if the speed is reduced from 600 rpm to 400 rpm with load torque maintained constant ? 9

OR

- c) Explain the experimental procedure to find stray losses of a d.c. machine by retardation test. 7
- d) A 230 V, shunt motor has an armature resistance of  $0.4 \Omega$ . The starting armature current must not exceed 45 A. If the number of sections are 5, calculate the values of resistance steps to be used in the starter. 8
- V. a) Compare the weight of copper used in a 2 winding transformer and auto transformer. 7
- b) Two transformers each of 80 kVa are connected in parallel. One has resistance and reactance of 1% and 4% respectively and other has 1.5% resistance and 6% reactance. Calculate the load shared by each transformer and the corresponding power factor, when the load shared is 100 kVa at 0.8 p.f. lagging. 8

OR

- c) Explain switching transients in a transformer. 6
- d) A 3 phase step down transformer is connected to 6.6 kV mains and takes 10A. Calculate the secondary line voltage, line current and o/p for the following connection : 9
- Ratio of turns/phase = 12.

- |                      |                  |
|----------------------|------------------|
| i) $\Delta - \Delta$ | ii) Y - Y        |
| iii) $\Delta - Y$    | iv) Y - $\Delta$ |

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**PT2K6/2K6EE406 : ELECTRICAL ENGG. MATERIALS**

Time : 3 Hours

Max. Marks : 100

*Instructions : Answer all questions.  
Missing datas may be assumed suitably.*

**PART – A**

- I. a) Explain the energy band diagram of semiconductor material. **5**
- b) What is energy level of a molecule ? Explain the same showing energy levels. **5**
- c) Explain the properties of dielectric materials. **5**
- d) What is ferroelectricity ? Explain. **5**
- e) Explain the precautions to be taken on transformer oil testing. **5**
- f) List the applications of solid dielectric material. **5**
- g) Write a note on photovoltaic applications. **5**
- h) What is electron microscopy ? Explain. **5**

**PART – B**

- I. a) Explain the heat developed in a current carrying conductor and obtain the relation  $\omega = \sigma E^2$ . **8**
- b) What are hard magnetic materials ? Explain. **7**

**OR**

- c) Explain about Thermo-electric effects on current carrying conductor. **8**
- d) Explain the factors affecting permeability and hysteresis loss. **7**

**P.T.O.**



- III. a) What is dielectric polarization ? Explain. 8  
b) What is dipolar relaxation ? Explain. 7  
OR  
c) Discuss the breakdown strength in gaseous, liquid and solid dielectric materials. 15
- IV. a) Discuss the following :  
i) Electronic polarization  
ii) Monatomic gases  
iii) Hysteresis curve. 9  
b) Write a note on inorganic materials used in electrical apparatus. 6  
OR  
c) What is Paschen's law ? Explain. 8  
d) Write a note on ageing of insulators. 7
- V. a) What are solar selective coatings ? Discuss the use of solar selective coatings for enhanced solar thermal energy collection. 15  
OR  
b) Explain the concept of electron spin resonance. 6  
c) Explain the technique of  
i) Optical microscopy  
ii) Photo electron spectroscopy. 9
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