Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.Tech (CSE/IT)/SEM-8/IT-802E/2010
2010
ADVANCED TOPICS IN INDUSTRIAL APPLICATIONS

Time Allotted : 3 Hours   *Full Marks* : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
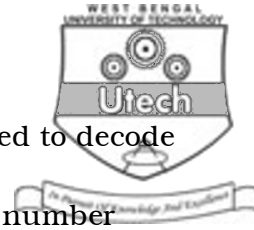as far as practicable.*

GROUP – A
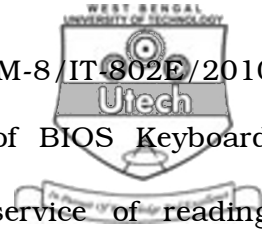### (Multiple Choice Type Questions)

1.   Choose the correct alternatives for any *ten* of the following :

$10 \times 1 = 10$

i)   Which of the following ports allow dynamic attachment
and detachment of peripherals to the P.C. ?

a)   Parallet Port   b)   Serial Port

c)   USB   d)   Com2.

ii) In relational data model, tables are called relations,
because

a)   data are organized in tabular format

b)   tables are subset of cartesian product

c)   all of these

d)   none of these.

8276   [Turn over

iii) In DOS the command DEBUG u is used to decode

    a) Hexadecimal number to decimal number

    b) ASSEMBLY language code to absolute machine code

    c) Absolute machine code to ASSEMBLY LANGUAGE code

    d) Hexadecimal number to binary number.

iv) The maximum bandwidth possible with 8 bit ISA BUS is

    a) 19·08 Mb/s   b) 64 Mb/s

    c) 133·28 Mb/s   d) 264 Mb/s.

v) In embedded SQL, pre-compiler divides the source file into

    a) two parts   b) three parts

    c) four parts   d) none of these.

vi) After software testing it can be said that

    a) no errors are present in the software

    b) the software will never fail

    c) errors not detected till now cannot be detected

    d) testing cannot show the absence of defects.

vii) Which of the following functions of BIOS Keyboard Services (INT-16H) offers the service of reading character from Enhanced Key board ?

    a)   00H   b)   01h

    c)   1OH   d)   11h.

viii) Entity integrity represents that

    a)   there must have a primary key for each relation

    b)   the primary key must be not null

    c)   there may exist a foreign key in each relation

    d)   none of these.

ix) Reverse Engineering is a process of

    a)   Design recovery

    b)   Inventory analysis

    c)   Document restructuring

    d)   Building user interface.

x) Which of the following is used for industrial remote measurement and control applications?

a) I/O BUS   b) Parallel Port

c) Serial Port   d) Field Bus.

xi) In use case diagram, actor is represented by

a) Stick man   b) Ellipse

c) Rectangle   d) None of these.

xii) The BIOS data area extends over the memory address

a) 00000H to 002FFH

b) 00300H to 003FFH

c) 00400H to 004FFH

d) 00500H to 005FFH.

xiii) UML stands for

a) United modeling language

b) Unified modeling language

c) Unifying modified language

d) Unifying modeling language.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following.   3 × 5 = 15

2.   Write down the C program for testing the logic gate IC7400 through parallel port.

3.   Define join dependency with example. What are the benefits of PL/SQL over SQL ?   3 + 2

4.   Discuss CASE tools.

5.   Draw a module for DAC to 8 bit ISA BUS.

6.   Explain the difference between concrete class, template class and abstract class and discuss how they are represented in UML class diagram.
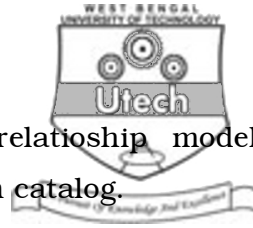
GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following.   3 × 15 = 45

7.   a)   Draw a block diagram showing the modes and the various subsystem in he Windows Server 2003 System Architecture.

     b)   Describe the integral subsystems used to perform certain critical OS Functions.   6 + 9

8. Discuss the basic concepts of entity relatioship model. Differentiate between metadata and system catalog.

   Consider the following scenario :

   A library information system offers basic services round the clock to its members. The functional requirements of this system are as follows —
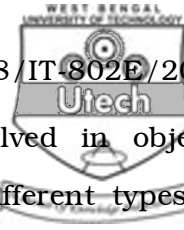
   i) Members must be able to issue/return books to the library. Each transaction has to be recorded and the members must be able to review all transactions performed in his membership.

   ii) Access to the library is provided by a member-id.

   iii) The system should be designed in such a way that it automatically checks the number of books issued by the members. If the number of books issued by a particular member exceeds the limit, it should checked automatically and generate a message.

   Design and extended ER diagram for the above scenario. Mention any assumption or design decisions that you make.

   $4 + 3 + 8$

9. Use BIOS sereil port services to

   a) Initialize COM1 to 9600 baud, 8 bit word, 1 stop bit and no parity

   b) To write the character 'A' to COM1

   c) To read character from COM1

   d) To read character by checking the status of the Port COM1. $3 + 4 + 4 + 4$

10. Briefly describe the different phases involved in object-oriented analysis & design. Explain the different types of actors used in use case diagram. Discuss with proper examples the difference between *uses* relationship and *extended* relationship in use case diagram.   7 + 4 + 4

11. Discuss with proper examples the difference between association relationship and dependency relationship in class diagram. What do you mean by multiplicity in class diagram ? Design a class diagram for the Courseware Management System. A description of the Courseware Management System is as follows. The primary objective of the courseware management system is to manage the different courses in an institution that involves faculties, students, course schedules and course coordinator. According to the course schedule, students are taught by different faculties and the overall management is done by course coordinator.   4 + 2 + 9