

N.B. : (1) All questions from 1 to 7 are compulsory.  
(2) Figure to right indicate the marks.

1. Attempt Both the Question :— 10
  - (a) What is Telnet ? List the uses of Telnet.
  - (b) Advantages and disadvantages of HTML
  
2. Attempt any **Three** from the following :— 15
  - (a) Define internet. What are the advantages and disadvantages of Internet ?
  - (b) Differentiate between WWW and Internet.
  - (c) Write short note on URL.
  - (d) List Features of any one Browser.
  
3. Attempt any **Three** from the following :— 15
  - (a) Explain <a> Tag with example.
  - (b) Explain Server side and Client side Image Mapping.
  - (c) What are different types of style sheet ? Explain with example..
  - (d) Explain the following tags  
<p>, <u>, <h1>, <pre>, <br>, <hr>
  
4. Attempt any **Three** from the following :— 15
  - (a) Explain client side & server side scripting.
  - (b) Explain the different types of operators available in java script.
  - (c) Write a short note on Math object.
  - (d) Explain for loop with example.
  
5. Attempt any **Three** from the following :— 15
  - (a) What is XML ? What are its characteristics ?
  - (b) What is DTD ? What are the different types of DTD ?
  - (c) Explain entities in XML.
  - (d) Explain the Anatomy of an XML file.
  
6. Attempt any **Three** from the following :— 15
  - (a) What is Php ? What's its use ?
  - (b) Write a PHP program to find prime numbers from 1 to 100.
  - (c) Explain different Data types in Php.
  - (d) Explain POST and GET Method.
  
7. Attempt any **Three** from the following :— 15
  - (a) What is MYSQL
  - (b) Explain Cookie.
  - (c) Explain What are PHP session and their important.
  - (d) Explain PHP mail() function.

Applied Mathematics-II (3 Hours)

N.B. : (1) All questions are compulsory.

(2) All questions equal marks.

1. Attempt any one :—

- (a) Obtain Fourier Series of  $f(x) = |\cos x|$  in  $(-\pi, \pi)$ . 10
- (b) State & Prove Necessary & Sufficient Conditions for Complex function to be Analytic in Cartesian form. 10

2. Attempt any Three :—

- (a) Express  $\cos 5x$  in terms of power of  $\sin x$  and  $\cos x$ . 5
- (b) Solve :  $x^5 + 32 = 0$  5
- (c) Derive the formula for  $\tanh^{-1}(x)$ . 5
- (d) Find the complex logarithm of (1)  $1 + i$  5  
(2)  $-3$

3. Attempt any Three :—

- (a) Find the Residues of  $f(z) = \frac{z}{(z+3)(z-2)^3}$  at their Poles. 5
- (b) Show that  $f(z) = ze^z$  is Analytic everywhere in  $\mathbb{C}$ . 5
- (c) Evaluate  $\int_C \frac{dz}{(z+2)(z-1)}$  where 'C' is  $|z| = 3$  5
- (d) Find the image of the line  $y = 1$  under the map  $f(z) = e^z$ . 5

4. Attempt any Three :—

- (a) Find the Laplace Transform of  $\sin 2t + t \cos t$ . 5
- (b) Evaluate  $\int_0^{\infty} e^{-2t} \sin^3 t \, dt$  by using Laplace Transform. 5
- (c) Find inverse Laplace Transform of  $\frac{2S+3}{(S+1)(S^2-4)}$  5
- (d) Find  $L^{-1} \left[ \cot^{-1} \left( \frac{1}{S} \right) \right]$  5

[TURN OVER]

5. Attempt any Three :—

(a) Evaluate  $\int_0^{\infty} \frac{dt}{1+t^2}$  5

(b) Evaluate  $\int_0^{\frac{\pi}{2}} \sin^7 \theta \cos^5 \theta d\theta$  5

(c) By using D.U.I.S., Prove that  $\int_0^1 \frac{x^p - 1}{\log x} dx = \log(1 + p)$  where  $p \geq 0$ . 5

(d) Evaluate  $\int_0^{\infty} e^{-x^2} dx$ . 5

6. Attempt any Three :—

(a) Obtain Fourier Series of  $f(x) = x|x|$  in  $(-\pi, \pi)$ . 5

(b) Obtain Fourier Transform of  $f(x) = e^{-|x|}$  5

(c) Obtain Half range Cosine Series of  $f(x) = x$  in  $(0, 3)$ . 5

(d) Obtain Fourier Cosine transform of  $f(t) = e^{-3t} + e^{2t}$ . 5

7. Attempt any Three :—

(a) Change the order & evaluate  $\int_0^1 \int_0^x xy \, dy \, dx$ . 5

(b) Evaluate  $\int_0^1 \int_0^2 \int_0^3 x^2 y z^3 \, dz \, dx \, dy$ . 5

(c) Find the Area Bounded by  $y = x$  and  $y = x^2$ . 5

(d) Find the Volume Bounded by  $x^2 + y^2 + z^2 = 4$  &  $x = 0, y = 0$  &  $z = 0$  by using Spherical Coordinates. 5

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Con. 3-16. Microprocessor & Microcontrollers  
(3 Hours)

MU-4536

[Total Marks : 100

*N.B. : All questions are compulsory.*

1. (a) Explain Basic organization of Microprocessor Based System. 5  
(b) Write a short note on PSW register in 8051. 5
2. Attempt any **three** of the following :—
  - (a) Write 8085 program to add two 8 bit numbers. 5
  - (b) Write a short note on buffer. 5
  - (c) Explain the concept of latch. 5
  - (d) Explain different types of semiconductor memory. 5
3. Attempt any **three** of the following :—
  - (a) Explain Architecture of Intel 8085 with diagram. 5
  - (b) What are the different types of 8085 system bus ? 5
  - (c) Explain two techniques of Memory Interfacing. 5
  - (d) Draw a pin diagram of 8085 & explain any 5 pins in detail. 5
4. Attempt any **three** of the following :—
  - (a) Explain Addressing Modes of 8085. 5
  - (b) Explain arithmetic and logical instructions using suitable example. 5
  - (c) Explain the following instructions:- 5
    - (i) MOV B,C (ii) INR M (iii) JMP 2001 (iv) HLT, (v) RAL
  - (d) Write an assembly program to find one's complement of 8 bit number stored in B register and store result back to B register. 5
5. Attempt any **three** of the following :—
  - (a) Explain the function of modern day computer system with diagram. 5
  - (b) Define PCI bus with its need. 5
  - (c) Explain the concept of Cache Memory. 5
  - (d) What are the benefits of RAID. 5
6. Attempt any **three** of the following :—
  - (a) Draw pin out diagram of 8051. Explain briefly. 5
  - (b) Write a 8051 program to display multiplication of two 8 bit numbers on port 2. 5
  - (c) Explain the flag register of 8051 microcontroller. 5
  - (d) Explain the function of Assembler, Compiler, Linker, Loader & Assembler directive. 5
7. Attempt any **three** of the following :—
  - (a) Explain the role of Port 2 in 8051. 5
  - (b) Explain 8051 Architecture in brief with diagram. 5
  - (c) Explain the immediate addressing mode in 8051. 5
  - (d) Explain the following instruction of 8051 :— 5
    - (i) JNC label (ii) PUSH direct (iii) XCH A, R1 (iv) RRC (v) ADD A, 40H

Con. 4-16. Database Management systems  
(3 Hours)

MU-4166

[Total Marks : 100

- N.B. : (1) All questions are compulsory (Q. 1 to Q. 7).  
(2) Attempt any three sub questions out of four from Q. 2 to Q. 7.  
(3) Draw neat and labelled diagram wherever necessary.

1. (a) What is normalization ? Explain 1NF and 2NF normalization with example. 5  
(b) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. 5
2. (a) Define Database System. What is the purpose of database system ? 5  
(b) What are the advantages and disadvantages of database system ? 5  
(c) What is transaction management ? Explain it with example. 5  
(d) Explain the view of data in DBMS. 5
3. (a) Write short note on degrees of data abstraction. 5  
(b) Define data model. Explain the data model in detail. 5  
(c) Describe the basic building blocks of data model. 5  
(d) Explain the business rules for data model. 5
4. (a) Define the following terms :— 5  
(i) Tuple (ii) Attribute (iii) Domain (iv) Primary Key (v) Foreign Key.  
(b) Explain weak entity and strong entity with example. 5  
(c) What are the Features of Good Relational Database Design Normalization ? 5  
(d) List the Codd's rules and explain any two in detail. 5
5. (a) Explain selection and projection in relational calculus with example. 5  
(b) Distinguish between relational algebra and relational calculus. 5  
(c) Explain any two set operations with example. 5  
(d) Write the equivalent relational algebra expression for any three given below queries. 5  
Loan(loan\_no, branch\_name, loan\_amount, customer\_no)  
Customer(customer\_no, customer\_name, city)  
(i) Find all loan numbers for loans with an amount greater than \$1200.  
(ii) Find branch name, loan number, customer name and amount for loans of below \$5000.  
(iii) Find all customers having a loan from the MTU branch, and the city in which they live
6. (a) What is trigger ? Explain it with syntax and example. 5  
(b) What is join ? Explain equijoin and non-equijoin with example. 5  
(c) Explain the aggregate functions in SQL are as follows :— 5  
AVG(), COUNT(), MAX(), MIN(), SUM()  
(d) Write short note on :— 5  
(i) Data Integrity, (ii) Check constraint, (iii) Not null constraint.
7. (a) Explain Acid properties in detail. 5  
(b) Draw the transaction state diagram and Explain different states of transaction. 5  
(c) What is Serializability ? Explain Serializable Schedule Classification of Conflict Serializable and View Serializable. 5  
(d) What is time stamping ? Explain. 5

N.B. : (1) All questions from Question Nos. 1 to 7 are compulsory.  
(2) Figure to right indicate the marks.

1. Attempt **both** the questions :— 10
  - (a) What is data communication ? Explain 5 components of data communication system.
  - (b) Explain the process of digital to analog conversion.
  
2. Attempt any **three (5 marks each)** :— 15
  - (a) Explain port address and MAC address in details
  - (b) What is signal propagation ?
  - (c) Explain the concept of protocols.
  - (d) Explain the following terms: Single and composite signal, Phase and frequency.
  
3. Attempt any **three (5 marks each)** :— 15
  - (a) What is OSI ? Explain in brief.
  - (b) Explain structure of IPV4 Address with example.
  - (c) What is addressing ? Explain different types of addressing.
  - (d) Explain TCP/IP reference model.
  
4. Attempt any **three (5 marks each)** :— 15
  - (a) What is error detection technique ? Explain Checksum in detail
  - (b) Explain Hamming distance with example.
  - (c) Write notes on stop-and-wait ARQ.
  - (d) Define error and its type with examples.
  
5. Attempt any three **(5 marks each)** :— 15
  - (a) What are transmission modes in terms of direction ?
  - (b) Explain serial transmission mode ?
  - (c) What is Transmission Impairment ? Explain Attenuation in detail.
  - (d) What is error detection technique ? Explain Checksum in detail
  
6. Attempt any **three (5 marks each)** :— 15
  - (a) What is network ?
  - (b) Define network topologies. Explain the advantages BUS and Ring topologies
  - (c) Explain Packet Switching.
  - (d) What is noise ? Explain different category of noise.
  
7. Attempt any **three (5 marks each)** :— 15
  - (a) Comparison IPv4 & IPv6 in detail.
  - (b) Write a short note on Unicast, Multicast & Broadcast.
  - (c) Draw neat diagram of IPv6 Header format and explain.
  - (d) Explain transition mechanism of IPV6.