

Note: (1) All Questions from question nos. 1 to 7 are compulsory.  
(2) Figures to right indicate the marks.

1. Attempt both the questions:- 10
  - (a) Write notes on HTTP, URL and FTP.
  - (b) Define Internet. What are advantages & disadvantages of internet
2. Attempt any three questions:- (5 marks each) 15
  - (a) Define E-commerce and different types of e-commerce.
  - (b) What are the difference between WWW and internet?
  - (c) Write a short note on E-business.
  - (d) Write notes on DNS and ISP.
3. Attempt any three questions:- (5 marks each) 15
  - (a) What is imagemap? Explain with example.
  - (b) What are the different types of style sheet? Explain with example.
  - (c) What is a list in HTML? Explain its type using an example.
  - (d) Explain following tags : <font>, <table>, <pre>, <hr>, <iframe>
4. Attempt any three questions:- (5 marks each) 15
  - (a) Write a program in java script to find the number entered by user in textbox is prime or not using function.
  - (b) Write a JavaScript code to print the factorial of a given no.
  - (c) Write a short note on Math object.
  - (d) Write short notes on Event handlers giving five examples.
5. Attempt any three questions:- (5 marks each) 15
  - (a) Explain internal and external DTD.
  - (b) How to create XML document?
  - (c) What is XML schema?
  - (d) What is XSL? Explain in brief.
6. Attempt any three questions:- (5 marks each) 15
  - (a) What is PHP? Give the features of PHP.
  - (b) Explain different data types in Php.
  - (c) What is MySQL? Give its salient features.
  - (d) What are the naming rules of variables in PHP?
7. Attempt any three questions:- (5 marks each) 15
  - (a) Write a program in PHP to display the user name and Print "Welcome <Username>!".
  - (b) Explain how cookies are used in PHP?
  - (c) Explain the string operators in PHP with examples.
  - (d) Explain what are PHP sessions? What is their importance?

N.B. (1) ALL QUESTIONS ARE COMPULSORY  
(2) ALL QUESTIONS ARE CARRY EQUAL MARKS.

Q.1 Attempt any one:-

(a) Obtain Fourier Series of  $x \cos x$  in  $(-\pi, \pi)$ . [10]

(b) Find the complex number  $z$  if  $\arg(z+1) = \frac{\pi}{6}$  and  $\arg(z-1) = \frac{2\pi}{3}$ . [10]

Q.2 Attempt any Three:-

(a) Express  $\cos 4\alpha$  &  $\sin 4\alpha$  in terms of power of  $\sin \alpha$  and  $\cos \alpha$ . [05]

(b) Solve :  $y^5 + 1 = 0$  [05]

(c) Derive the formula for  $\text{Cosh}^{-1}(x)$ . [05]

(d) Find the square root of  $21 - 20i$ . [05]

Q.3 Attempt any Three:-

(a) Find the bilinear Transformation which maps  $0, i$  &  $\infty$  to  $1, 0$  &  $-1$ . [05]

(b) Show that  $f(Z) = Z^3$  is Analytic. [05]

(c) Evaluate  $\int_C \frac{dz}{(z+1)(z-2)}$  where 'C' is  $|z|=1.5$  [05]

(d) Find the image of the line  $x+y=-1$  under the map  $W = \frac{1}{Z}$ . [05]

Q.4 Attempt any Three:-

(a) Find the Laplace Transform of  $\sin 2t \cos 3t$  [05]

(b) Evaluate  $\int_0^{\infty} \frac{e^{-t} - e^{-3t}}{t} dt$  by using Laplace Transform. [05]

(c) Find inverse Laplace Transform of  $\frac{S+3}{(S+1)(S^2+4)}$  [05]

(d) Find  $L^{-1}[\tan^{-1}(\frac{2}{S})]$  [05]

[TURN OVER

Q.5 Attempt any Three:-

(a) Evaluate  $\int_0^{\infty} \frac{dx}{1+x^2}$  [5]

(b) Evaluate  $\int_0^1 x[\log(\frac{1}{x})]^4 dx$  [5]

(c) Prove that  $\int_0^1 \frac{x^a - 1}{\log x} dx = \log(1+a)$  where  $a \geq 0$ . [5]

(d) Evaluate  $\int_0^{\infty} 5^{-4x^2} dx$ . [5]

Q.6 Attempt any Three:-

(a) Obtain Fourier series of  $f(x) = e^{-x}$  in  $(0, 2\pi)$ . [5]

(b) Obtain Half range Sine Series of  $x^2$  in  $(0, \pi)$ . [5]

(c) Obtain Half range Cosine Series of  $x^2$  in  $(0, 3)$ . [5]

(d) Find the fourier transform of  $f(t) = \frac{1}{2a} |t| \leq a$  [5]  
 $= 0 \quad |t| > a$

Q.7 Attempt any Three:-

(a) Evaluate  $\int_0^1 \int_{x^2}^{2-x} xy \, dy \, dx$  . [5]

(b) Evaluate  $\int_0^1 \int_0^2 \int_0^3 xyz^2 \, dz \, dx \, dy$  . [5]

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

(d) Find the Volume Bounded by  $Z = x^2 + y^2$  and the plane  $Z = 4$ . [5]

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**Note:** 1) All Questions are compulsory

- Q 1.** A) Explain Basic organization of Microprocessor Based System. 5  
 B) Draw pin out diagram of 8051. Explain briefly. 5
- Q 2.** Attempt any three of the following:-  
 A) Describe chip select logic using gates with suitable e.g. 5  
 B) Explain different types of semiconductor memory. 5  
 C) What is latch? Describe its function. 5  
 D) Write a 8085 program to subtract two numbers. 5
- Q 3.** Attempt any three of the following:-  
 A) Differentiate between SRAM and DRAM. 5  
 B) Explain Architecture of Intel 8085 with diagram. 5  
 C) Explain Flag Registers in 8085. 5  
 D) Differentiate between Memory Mapped I/O and I/O Mapped I/O. 5
- Q 4.** Attempt any three of the following:-  
 A) Explain Addressing Modes of 8085. 5  
 B) Explain different types of buses in 8085 microprocessor. 5  
 C) Explain the following instructions:-  
 (i) MVI A, 20H, (ii) SUB M, (iii) OUT 01H, (iv) STAX B, (v) CMA 5  
 D) Explain arithmetic and logical instructions using suitable example. 5
- Q 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 features. 5  
 C) What is Cache Memory? Why it is needed? 5  
 D) Explain RAID 0 level with advantages & disadvantages. 5
- Q 6.** Attempt any three of the following:-  
 A) Write a short note on PSW register in 8051. 5  
 B) Explain the features of 8051 micro-controller. 5  
 C) Explain the operations of stack pointer in 8051. 5  
 D) Explain the concept of SFR in the 8051. 5
- Q 7.** Attempt any three of the following:-  
 A) Explain the function of Assembler, Compiler, Linker, Loader & Assembler directive. 5  
 B) Explain 8051 Architecture in brief with diagram. 5  
 C) Explain various addressing modes of 8051. 5  
 D) Write a program to Multiply content of Register R1 and Register B and Store the result in register 53 and 54H memory. 5

Time: 3 hours

Marks:100

- N.B. : 1. All questions are compulsory (Q1-Q7)  
2. Attempt any 3 sub questions out of 4 from Q2 to Q7  
3. Draw neat and labelled diagram wherever necessary.

- Q1** a) Explain ACID properties. 5m  
b) Explain any five E.F. Codd's rules. 5m
- Q2** a) What is database system? List any two database system applications. 5m  
b) What is the purpose of database management system? 5m  
c) Draw and describe architecture of database system structure. 5m  
d) Write short note on transaction management. 5m
- Q3** a) What are the degrees of data abstraction? Explain. 5m  
b) Explain the merits and demerits of Network database model. 5m  
c) Explain the business rules. 5m  
d) Explain the hierarchical databases of data model. 5m
- Q4** a) State and explain relational integrity rules. 5m  
b) Draw ER diagram for educational institute database consisting of four entities Student, Department, Class, Faculty. Student has a unique id, the student can enrol for multiple classes and has a most one major.  
1) Faculty must belong to department and faculty can teach multiple classes.  
2) Each class is taught by only faculty.  
3) Every student will get grade for the class he/she has enrolled.  
c) Define the following terms i) Aggregation ii) Generalization iii) Specialization 5m  
d) What is normalization? State and Explain its forms briefly. 5m
- Q5** a) What is join? Explain the different types of joins with example. 5m  
b) Explain Tuple Relational Calculus and Domain Relational Calculus. 5m  
c) Explain any two set operations with syntax and example. 5m  
d) Write note on following terms with example i) select operation ii) project operation. 5m
- Q6** a) What is constraint? State and explain any two constraints with example. 5m  
b) Explain how to create and drop view with syntax and suitable example. 5m  
c) Explain any four aggregate function with example. 5m  
d) Explain triggers with suitable examples. 5m
- Q7** a) Define deadlock? What are the different methods used to recover from deadlock? 5m  
b) What are the different types of transaction state? Explain. 5m  
c) Explain time stamping methods in detail. 5m  
d) Explain concurrency control in detail. 5m

Note: (1) All Questions from Question nos. 1 to 7 are compulsory.

(2) Figures to right indicate the marks.

1. Attempt both the questions:- 10
  - (a) What is data communication? Explain fundamental characteristics of data communication system.
  - (b) Differentiate between digital and analog signals.
  
2. Attempt any three (5 marks each) :- 15
  - (a) What is addressing? Explain different types of addressing.
  - (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) Explain transport layer of OSI model.
  - (b) What is transmission modes in terms of direction.
  - (c) Define computer network? Explain different types.
  - (d) Explain the layers of TCP/IP model
  
4. Attempt any three (5 marks each) :- 15
  - (a) Write notes on LRC & VRC.
  - (b) Define data and information. What are different types of representing it.
  - (c) What is error detection technique? Explain Checksum in detail
  - (d) Define error and its type with examples.
  
5. Attempt any three (5 marks each) :- 15
  - (a) What is synchronous transmission mode?
  - (b) Explain parallel transmission mode.
  - (c) What is Transmission Impairment? Explain Attenuation in detail.
  - (d) What is guided transmission media? Explain coaxial cable.
  
6. Attempt any three (5 marks each) :- 15
  - (a) What is switching? Explain types of switching.
  - (b) Define topology and explain different types of topologies.
  - (c) What is router? Explain characteristics of routing algorithm.
  - (d) What is network? Explain LAN, WAN & MAN.
  
7. Attempt any three (5 marks each) :- 15
  - (a) Differentiate IPv4 & IPv6 in detail.
  - (b) Differentiate between radio waves and infrared?
  - (c) Draw the diagram of IPv6 Header format and explain.
  - (d) What is transition? Explain transition mechanism of IPV6.