(3 hours) [80 marks]

NOTE: 1. Question No 1 is compulsory
        2. Attempt any three questions from remaining.
        3. Assume suitable data if necessary and state the same.

Q1. Answer following.
a. Create a HTML page Showing a message "I use media query". Write media query such that the text color changes to light gray when browser window is 600px wide or less and otherwise it is black. [05]
b. Explain Geo Location API with example usage. [05]
c. What are characteristics of Rich Internet Application? [05]
d. Differentiate between REST and SOAP. [05]

Q2.
a. What is AJAX ? Explain steps required to process AJAX with example. [10]
b. Explain various cross browser compatibility issues. [10]

Q3.
a. What are benifits of using JSON over XML data. Create a XML page storing name, country, runs scored, balls faced for three batsman. Represent same data as JSON object [10]
b. Explain Micro Data with suitable example. How to verify support for Micro Data? [10]

Q4.
a. Explain how session management is done in PHP. Clearly explain how to create, access, modify session variables in PHP. [10]
b. Explain important features of Django framework. [10]

Q5.
a. Create a HTML form that accepts first name, last name, department and designation from user. Create a PHP code that stores this information in a mysql database named employee with an existing table emp_details having appropriate schema and acknowledges the user through appropriate message about success or failure during data insertion. Assume suitable user name and password to access database. [10]
b. Explain with proper syntax and example how to use different types of CSS selectors. [10]

Q.6
a. Explain <audio>, <video> and <canvas> elements in HTML5. [10]
b. Explain "Window" object of JavaScript DOM. Write JavaScript code to change background colour of the web page automatically after every five seconds. [10]

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Time: 3 Hours　　　　　　　　　　　　　　　　　　　　**Marks: 80**

N.B.: 1. Question No. 1 compulsory.
　　　 2. Attempt any Three out of remaining Five questions.
　　　 3. Figures to the right indicate full marks.
　　　 4. Draw neat diagram wherever necessary.

1. Solve any four out of five
   A) What are the design metrics of an embedded systems.　　　　　　　　　05
   B) Discuss working of stepper motor.　　　　　　　　　　　　　　　　05
   C) Explain different types of kernals.　　　　　　　　　　　　　　　　05
   D) Explain in brief Assembler Directives with respect to 8051 Assembler.　05
   E) List important features of ARM architecture..　　　　　　　　　　　05

2. A) Describe priority inversion problem and explain how to resolve it?　　　10
   B) Explain various addressing modes of 8051 microcontroller.　　　　　　10

3. A) Assuming crystal frequency = 11.0592 MHz, write an assembly language program for
      8051 to generate square wave of 2 KHz at pin P2.5. Show necessary delay calculation.
      (Use Timer-0, Mode-0)　　　　　　　　　　　　　　　　　　　　　10
   B) List and explain how exceptions and interrupts handled in ARM7.　　　10

4. A) Write an assembly language program to generate triangular wave using DAC interfacing with
      8051 micro controller.　　　　　　　　　　　　　　　　　　　　　10
   B) Explain various addressing nodes of ARM7 with suitable example instruction.　10

5. A) List discuss different features of Arduino and Raspberry-pi along with their schematic diagrams.10
   B) Draw and Explain interrupt structure of 8051 microcontroller.　　　　　10

6. Write short notes on :
   A) SoC and DSP (Embedded system core)　　　　　　　　　　　　　06
   B) ARM development tools.　　　　　　　　　　　　　　　　　　07
   C) Extended libraries of Arduino　　　　　　　　　　　　　　　　07

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(3 Hours) [Total Marks: 80]

N.B.: (1) Question No.1 is compulsory.

(2) Attempt **any three** out of remaining questions.

(3) Assume Suitable data if necessary.

(4) **Figures** to the **right** indicate full **marks**.

Q1. (a) Explain with example how divide and conquer strategy is used in Binary Search? 5

(b) Explain flow shop scheduling technique. 5

(c) Write a note on AVL Tree. 5

(d) Write an algorithm for finding minimum and maximum number from given set. 5

Q2. (a) What is longest common subsequence problem? Find LCS for following string. 10

X=ACBAED

Y=ABCABE

(b) Which are the different methods of solving recurrences? Explain with examples. 10

Q3. (a) Compare Greedy and Dynamic Programming approach for an algorithm design. Explain how both can be used to solve knapsack problem. 10

(b) Explain Huffman algorithm. Construct Huffman tree for 10

MAHARASHTRA with its optimal code.

Q4. (a) Explain Job sequencing with deadlines. 10
Let n=4,(p1,p2,p3,p4)=(100,10,15,27) and (d1,d2,d3,d4)=(2,1,2,1).Find feasible solution.

(b) Sort the following numbers using quick sort. Also derive time complexity of quick sort. 10
27 10 36 18 25 45

Page **1** of **2**

Q5. (a) Apply all pair shortest path on the following graph   10
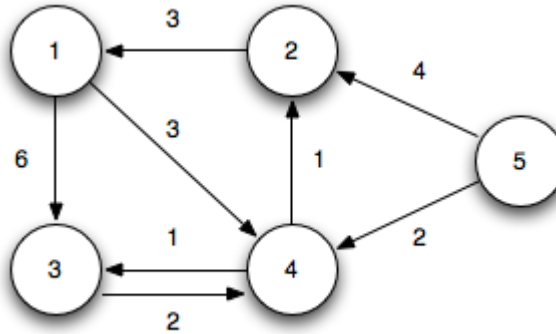
(b) Given a chain of four matrices A_1, A_2, A_3 and A_4 with $P_0=5$, $P_1=4$, $P_2=6$,   10
$P_3=2$ and $P_4=7$. Find m[1,4] using matrix chain multiplication

Q6.   Write Note on (**Any two**)   20
  i.   Rabin Karp Algorithm.
  ii.   Topological Sort.
  iii. Knuth-Morrie-Pratt algorithm.
  iv.   Red-Black Tree.

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[Time: Three Hours]   **[Marks: 80]**

N.B: (1) Question No.1 is compulsory

           (2) Attempt any three of remaining five questions

           (3) Assume any suitable data if necessary and justify the same

Q 1	a)	Explain Brute-Force Nested Loop Join algorithm.	5
	b)	What is dead lock, explain wait and die scheme used for deadlock prevention.	5
	c)	What is Temporal Database? What are its characteristics?	5
	d)	Explain roll-up, drill down, slice, dice operations in OLAP.	5
Q 2	a)	Explain basic time stamp ordering protocol and compare it with 2 phase locking protocol in terms of deadlock and rollbacks.	10
	b)	Explain Mandatory Access Control and Discretionary Access Control, also explain access control list and access control entry w.r.t. the same.	10
Q 3	a)	Why fragmentation is required in distributed data bases, Explain Vertical fragmentation with example, comment on completeness , reconstruction and disjointness aspect of it.	10
	b)	Explain 2 Phase commit protocol with proper flow diagram.	10
Q 4	a)	Explain MOLAP, ROLAP and HOLAP Models.	10
	b)	What is the significance of serializability, explain conflict serializability and view serializability with the help of example.	10
Q 5	a)	Explain types of data extraction methods in ETL process	10
	b)	What is basic difference between pessimistic and optimistic concurrency control algorithm. Explain distributed 2PL algorithm.	10
Q 6		Write short notes on **(any two)**	20

       a. Role Based Access Control

       b. Query Optimization

       c. Data Warehouse Architecture

       d. Challenges in ETL functions

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Time : 03 hrs.   **Marks : 80**

Note : Question No 1 is compulsory.
   Attempt any 3 questions from remaining.
   Assume suitable data whenever necessary.

Q1. You are appointed as developer of e-commerce website for Online Education
   Portal. Design and develop website to promote the same.   20

Q2 A) Define e commerce and explain its different types with examples.   10

   B) Explain E commerce Trade cycle with example.   10

Q3 A) Explain various session management techniques in e- commerce.   10

   B) Write short note on middleware technologies.   10

Q4 A) Explain security aspects of E-commerce.   10

   B) Discuss SET protocol architecture with diagram.   10

Q5 A) Explain characteristics of Internet Payment System.   10

   B) What is value chain process in E-commerce? Discuss with diagram.   10

Q6 A) Explain critical elements of E-business.   10

   B) Write short note on EDI.   10

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Time (3 Hours)   [Total Marks 80]

N. B:
1. Question No. 1 is Compulsory.
2. Solve any THREE from Question No. 2 to 6.
3. Draw neat well labeled diagram wherever necessary.

Q. 1	a)	Enlist security goals. Discuss their significance.	(5)
	b)	Compare and contrast HMAC and CMAC.	(5)
	c)	SHA provides better security than MD. Justify.	(5)
	d)	Design Sample Digital Certificate and explain each field of it.	(5)

Q. 2	a)	Explain Transposition Ciphers with illustrative examples.	(10)
	b)	Given modulus n=91 and public key, e=5, find the values of p, q, phi(n), and d using RSA. Encrypt M=25. Also perform decryption.	(10)

Q. 3	a)	What are Block Cipher Modes. Describe any two in detail.	(10)
	b)	Using Affine cipher, encrypt the Plaintext 'SECURITY' with key pair (5, 2).	(10)

Q. 4	a)	Given generator g= 2 and n=11. Using Diffie Hellman algorithm solve the following: 1. Show that 2 is primitive root of 11 2. If A's public key is 9 , what is A's private key? 3. If B's public key is 3, what is B's private key? 4. Calculate the shared secret key.	(10)
	b)	Explain different types of Denial of Service attacks.	(10)

Q. 5	a)	What is Authentication? Explain Needham Schroeder Authentication protocol.	(10)
	b)	What is a firewall? Explain different types of firewall.	(10)

Q. 6		Write short notes on any **FOUR**: 1. Email Security 2. SSL/TLS 3. IPSec 4. Port Scanning. 5. Honey pots	(20)

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(3 Hours) [Total Marks: 80]

NB : 1) **Question 1 is compulsory.**
2) Attempt any **three** questions from the **remaining** questions.
3) **Assume** suitable **data** wherever applicable.

Q1.	a	Explain the applications of virtual reality	5
	b	Explain parallel and perspective projections	5
	c	Explain the need for homogeneous matrix representation.	5
	d	Explain boundary filling and flood filling algorithm	5
Q2.	a	Explain Bresenham's line drawing algorithm. How it is different from DDA	10
	b	Define virtual reality. Explain the components of VR.	10
Q3.	a	Explain input and output devices used for virtual reality systems.	10
	b	Explain Sutherland Hodgeman polygon clipping.	10
Q4.	a	Define curve? How Bezier curve algorithm works? List out properties of the same.	10
	b	Explain graphics rendering pipeline.	10
Q5	a	Explain 3D transformations i.e. translation, scaling, rotation, reflection with examples.	10
	b	Describe computer animation and the use of 2D and 3D morphing in it.	10
Q6.		Write short notes on **(any four)**	20

        a. VRML
        b. Color Models.
        c. Fractals
        d. Aliasing and Anti-aliasing
        e. Text clipping

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