

Time: 3 Hours

Total 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.

- Q1. Solve any four out of five
- A) Differentiate between Microprocessor and Microcontrollers 05
  - B) Give salient features of ARM7 processor 05
  - C) Explain in brief various characteristics of RTOS 05
  - D) What are the design metrics of an embedded systems 05
  - E) List an important features of Raspberry\_pi board. 05
- Q2. A) Explain SJMP,AJMP and LJMP instructions of 8051 in detail 10
- B) Explain CPSR of ARM7 in detail 10
- Q3. A) Write a program to transfer “INDIA” serially at 9600 baud rate with using 8051.Assume frequency 11.0592Mhz. 10
- B) Explain in brief the architecture of RTOS 10
- Q4. A) List and explain how exceptions and interrupts handled in ARM7. 10
- B) Write a program to generate a triangular waveform using DAC and 8051. 10
- Draw the interfacing circuit diagram
- Q5. A) Explain Internal memory organization of 8051 10
- B) Draw interfacing of keyboard matrix with 8051 in detail with diagram. 10
- Write a program to generate Hexadecimal values.
- Q6. Write notes on: (ANY TWO) 20
- a) Hard real time and Soft real time RTOS
  - b) Modes of timers in 8051
  - c) Interrupts of 8051
  - d) Extended libraries of Arduino

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(3 Hours)

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- N.B.:** (1) Question No.1 is compulsory.  
(2) Attempt three questions out of remaining.  
(3) Figures to right indicate full marks.

**Q.1 Answer the following**

- a. Explain <Canvas> element in HTML5. [05]
- b. Explain UDDI. [05]
- c. Create an HTML page which will divide a page in two horizontal fragments using frameset tag, each frame should have different background color & different headings. [05]
- d. Differentiate between XML & HTML. [05]

**Q.2**

- a. Explain Geo-location and media query with an example in HTML5 and CSS3. [10]
- b. What is cross browser compatibility? Explain the issues related to cross browser compatibility. [10]

**Q.3**

- a. Explain features of Django Framework. [10]
- b. Write an HTML code to process placement registration form which accepts the student details like name, address, email-id, contact-number, date of birth, percentage, branch (must be selected using radio button) and technology-preferred (using checkbox). Write the JavaScript code to validate the following
  - i. valid email id (“@” and “.”)
  - ii. all the fields must be filled before submission of the form.
  - iii. percentage validation is minimum first class ( $= > 60\%$ ) [10]

**Q.4**

- a. Draw the diagram of AJAX application model and traditional application web model and compare them. [10]
- b. Create an HTML form to accept the details like Name (Text field), Address (Textarea), Gender (Radio) and Company Name (Dropdown box) fields from user, Write a PHP code to store this information into employee table using MySQL database. [10]

**Q.5**

- a. Explain architecture of JSON mash-ups in detail with neat diagram. [10]
- b. Explain XML & DTD with example. [10]

**Q.6**

- a. Write a HTML5 code for embedding audio & video elements in web page. [10]
- b. Differentiate between REST & SOAP. [05]
- c. Explain characteristics of Rich Internet application (RIA). [05]

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(3 Hours)

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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. Differentiate between Greedy method and Dynamic Programming. 5
  - b. Write an algorithm for finding minimum and maximum number from a given set 5
  - c. Explain coin changing problem 5
  - d. Explain Flow Shop Scheduling Technique 5
- Q2a. Define AVL tree. Construct an AVL tree for the following data. 10
- 63, 9, 19, 27, 18, 108, 99, 81
- b. Write an algorithm for implementing Quick sort. Also, comment on its complexity. 10
- Q3a. What is longest common subsequence problem? Find LCS for the following string: 10
- String X: ABCDGH
- String Y: AEDFHR
- b. Explain Rabin Karp Algorithm in detail. 10
- Q4a. Which are the different methods of solving recurrences? Explain with suitable examples. 10
- b. Explain Travelling Salesman Problem with an example. 10
- Q5a. Explain Huffman Algorithm. Construct a Huffman Tree and find Huffman code for the message: KARNATAKA. 10
- b. Explain Knapsack Problem with an example. 10
- Q6 Write Short notes on (**any four**) 20
- a. Genetic Algorithm
  - b. Red and Black Tree
  - c. Merge Sort
  - d. Knuth Morris Pratt Algorithm
  - e. Optimal Binary Search Tree (OBST)

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

- Q1** a Prove that for 2D object successive rotation is additive. **5**  
 b Explain applications of computer graphics. **5**  
 c Explain types of projection. **5**  
 d Fractals **5**
- Q2** a Explain Cohen-Sutherland line clipping algorithm and clip line AB with A(40,15), B(75,45) against window with lower left corner (50,10) and top right corner(80,40). **10**  
 b Explain VR modeling **10**
- Q3** a Derive transformation matrix for rotation about fixed point and explain with suitable example. **10**  
 b Define window and viewport, explain viewing transformation. **10**
- Q4** a Generate five points on cubic bezier curve with control points A(0,0), B(1,2), C(3,2), D(2,0). **10**  
 b What is virtual reality? Explain components of virtual reality. **10**
- Q5** a Explain graphical rendering pipeline. **10**  
 b Explain midpoint circle algorithm. Find pixel positions to plot circle centered at origin and of radius 10. **10**
- Q6** Write short note (Any Four)
- a Inside test **5**  
 b Morphing **5**  
 c Raster and random scan display **5**  
 d Types of VR system **5**  
 e Relevance of homogeneous coordinate system. **5**

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(3 Hours)

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**Note : Question No 1 is compulsory**

**Attempt any 3 questions from remaining.**

**Assume suitable data whenever necessary**

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- Q1. Develop a complete business plan for startup to sell Garments online.  
It should include:  
The business model, strategic plan, marketing plan, SCM and CRM plan, Revenue model(s), security concerns and payment mode. [20]
- Q2 A) What are generic strategies? Give examples of the generic strategies adopted by e- retailer. [10]
- B) Explain the SET protocol for credit card payments [10]
- Q3 A) Discuss CRM strategy based on B-C Model [10]
- B) Explain Market Segmentation with types. How E-commerce companies use Customers behavior for market segmentation? [10]
- Q4 A) Explain the categories of Online Auction web sites , also brief the various auction related services. [10]
- B) Write short note on value chain approach for marketing. [10]
- Q5.A) Discuss the impact of consolidation on competition in e-commerce sector? [10]
- B) Whether inventory led model or the traditional marketplace model is a good option in case of e-grocery business give your opinion with arguments in support of your contention [10]
- Q6 A) Write notes on Application of RFID tag in SCM [10]
- B) Explain different session management techniques in e-commerce. [10]

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- N.B.:** 1. Question no. 1 is compulsory.  
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 3. Give examples wherever required.

- Q 1 a List out the twelve rules for distributed DB. **5**  
 b Explain Shared Memory and Shared Nothing Architecture for Parallel DBs. **5**  
 c Why BCNF is called as stricter than 3NF? Justify your answer. **5**  
 d What is Materialized View, What is its utility? **5**
- Q 2 a Explain Discretionary Access Control, Mandatory Access Control and Role- Based Access Control in brief. **10**  
 b Explain Significance of each step in ETL Process, also explain types of data extraction and data transformation. **10**
- Q 3 a Explain Sort-Merge Join and HASH Join. **10**  
 b Explain Wait- Die and Wound-Wait methods for Deadlock Prevention. Compare them in terms of no. of Possible rollbacks and Starvation. **10**
- Q 4 a Explain Star and Snow Flake Schema. Specify their Pros and Cons. **10**  
 b Explain Aries Algorithm in detail. **10**
- Q 5 a Consider a data warehouse for weather related data like region, date and temperature. Using this example explain all the OLAP operations **10**  
 b Explain Primary Horizontal, Derived Horizontal and Vertical Fragmentation with example. Comment on Completeness, Reconstruction and Disjointness Properties. **10**
- Q 6 Short Note on:  
 a Temporal databases **5**  
 b Spatial Databases **5**  
 c Inconsistent read, fuzzy read and phantom read problems in concurrent schedules. **5**  
 d Data Marts **5**

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**Instructions to the candidates, if any:-****N.B. :** (1) Question No. 1 is compulsory.

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

Q. No.	Marks
Q.1 (a) Write short note on eavesdropping.	(05)
(b) Write short note on Stenography.	(05)
(c) Write a short note on Blowfish.	(05)
(d) List S/MIME services.	(05)
Q.2 (a) Explain Transposition Ciphers with illustrative Example.	(10)
(b) Compare and contrast DES and AES.	(10)
Q.3 (a) Perform encryption and decryption using RSA algorithm with $p=7, q=11, e=17$ and $M=8$ .	(10)
(b) Describe the Block Cipher Modes in detail.	(10)
Q.4 (a) Explain Kerberos Protocol in detail.	(10)
(b) What Is PKI. Explain different PKI architectures in detail.	(10)
Q. 5 (a) Explain Diffie Hellman Key Exchange with suitable Example.	(10)
(b) Explain Needham-Schroeder protocol for secret key distribution with suitable diagram.	(10)
Q. 6 Write short notes on ( <b>Any Four</b> )	(20)
i) HMAC vs CMAC	
ii) ARP Spoofing	
iii) Port Scanning	
iv) Honeypot	
v) El-Gamal Algorithm	
vi) Session Hijacking	