

- N.B. 1) All questions are compulsory.
 2) Figures to the right indicate marks.
 3) Draw suitable diagrams and illustrations wherever necessary.
 4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All the Questions

A. Choose the correct alternative (5M)

- i. An automaton in which the output depends only on the states of the machine is called a _____ Machine
 - a) Mealy
 - b) Moore
 - c) Turing Machine
 - d) All of these.
- ii. A final state is also called _____ state.
 - a) Non-accepting
 - b) key
 - c) accepting
 - d) none of these
- iii. A type 2 grammar is also called _____ grammar
 - a) Context free
 - b) Context sensitive
 - c) Free
 - d) natural
- iv. $(a+aa^*)^*$ is equivalent to
 - a) $a(a^*)^*$
 - b) a^*
 - c) aa^*
 - d) none of these
- v. A terminal string $w \in L(G)$ is ambiguous if there exists _____ or more derivation trees for w .
 - a) one
 - b) two
 - c) neither a nor b
 - d) either a or b

B. Fill in the blanks (Choose correct one from the pool) (5M)

(pumping lemma, pigeonhole principle, Turing machine, reduction, production, stack, PDA, finite automata, regular expression, list)

- i. _____ can be used to prove that certain sets are not regular.
- ii. A pushdown automata contains _____ besides a input tape, a input alphabet, a finite state control, a set of final states and an initial state.
- iii. Type-0 languages can be accepted by _____.
- iv. _____ describe the languages accepted by finite state automata and are useful for representing certain sets of strings in an algebraic form.
- v. Context free languages (Type-2) can be accepted by _____

C. Explain the following terms in one or two lines (5M)

- i. Nondeterministic finite state machine
- ii. Grammar
- iii. Regular set
- iv. Chomsky Normal Form
- v. Language generated by the grammar $L(G)$

Q.2 Attempt the following: (Any THREE) (15M)

- A. Explain the process of construction of minimum automaton. Give suitable example to explain the concept.
- B. Construct a DFA accepting all strings over $\{a, b\}$ ending in ab .
- C. Construct a grammar G generating $\{xx \mid x \in \{a, b\}^*\}$
- D. If $G = (\{S\}, \{0, 1\}, \{S \rightarrow 0S1, S \rightarrow \Lambda\}, S)$, find $L(G)$.
- E. Define Ambiguous Grammar. Find if the grammar G with the following productions is ambiguous?
 $S \rightarrow SbS$
 $S \rightarrow a$
- F. Write a note on classification of Grammar.

Q.3 Attempt the following: (Any THREE) (15M)

- A. State and prove pumping lemma for regular sets.
- B. Give a regular expression for representing the set L of strings in which every 0 is immediately followed by at least two 1's. Also prove that the regular expression $R = \lambda + 1^*(011)^*(1^*(011))^*$ also describes the same set of strings.
- C. Explain the steps for reduction of grammar to Chomsky normal form.
- D. Convert the nondeterministic systems to deterministic systems.
- E. State and prove Arden's theorem.
- F. What is a derivation tree? Generate the derivation tree for the string $abaa$ using the grammar G with following set of productions

$$S \rightarrow aAS \mid a \mid SS$$

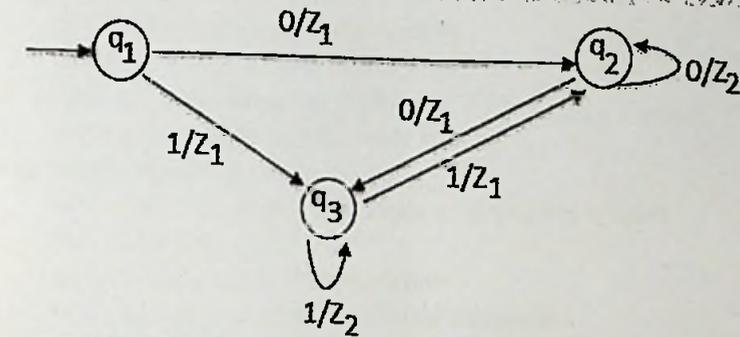
$$A \rightarrow SBA \mid ba$$

Q.4 Attempt the following: (Any THREE) (15M)

- A. Explain the Linear Bound Automata Model.
- B. Construct a PDA accepting $L = \{wcw^T \mid w \in \{a, b\}^*\}$
- C. Write a note on Halting problem of Turing Machine.
- D. Design a Turing Machine that accepts $\{0^n 1^n \mid n \geq 1\}$
- E. What is Turing Machine? Design a Turing Machine to recognize all strings consisting of an even number of 1's.
- F. Explain the structure and operation of pushdown automata.

Q.5 Attempt the following: (Any THREE) (15M)

- A. Construct a DFA with reduced states equivalent to the regular expression $10+(0+11)0^*1$
- B. Let G be the grammar with productions
 $S \rightarrow 0B \mid 1A,$
 $A \rightarrow 0 \mid 0S \mid 1AA$
 $B \rightarrow 1 \mid 1S \mid 0BB$
 For the string 00110101 , find
 (a) the leftmost derivation
 (b) rightmost derivation
- C. Consider a Mealy machine represented by the figure given below. Construct a Moore machine equivalent to this Mealy machine.



- D. What is regular set? Is $L = \{a^{2n} \mid n \geq 1\}$ regular?
- E. Construct the finite automaton equivalent to the regular expression $(0+1)^*(00+11)(0+1)^*$
- E. Write a note on operations on language.

- N.B. 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All (Each of 5Marks)

(15M)

(a) Multiple Choice Questions-

- 1) Round robin scheduling is essentially the pre-emptive version of _____
 - a) FIFO
 - b) Shortest job first
 - c) Shortest remaining
 - d) Longest time first
- 2) A page fault occurs
 - a) when the page is not in the memory
 - b) when the page is in the memory
 - c) when the process enters the blocked state
 - d) when the process is in the ready state
- 3) Multiprogramming systems _____
 - a) Are easier to develop than single programming systems
 - b) Execute each job faster
 - c) Execute more jobs in the same time
 - d) Are used only on large main frame computers
- 4) _____ is the situation in which a process is waiting on another process, which is also waiting on another process ... which is waiting on the first process. None of the processes involved in this circular wait are making progress.
 - a) Deadlock
 - b) Starvation
 - c) Dormant
 - d) None of the above
- 5) A major problem with priority scheduling is _____
 - a) Definite blocking
 - b) Starvation
 - c) Low priority
 - d) None of the above

(b) Fill in the blanks. Use following pool to answer questions

(hardware, software, PCB, FCB, processes, real time, LRU, FIFO)

- 1) The operating system of a computer serves as a software interface between the user and the _____.
- 2) A _____ contains information about the file, including ownership, permissions, and location of the file contents.
- 3) A thread is a _____ process.

- 4) _____ OS pays more attention on the meeting of the time limits.
 5) _____ page replacement algorithm suffers from Belady's anomaly.

(c) Answer in 1 – 2 sentences.

- i. What is operating system?
- ii. What is cascading termination?
- iii. Discuss the term safe state?
- iv. What is copy on write with respect to virtual memory?
- v. Explain the concept of file?

Q. 2 Attempt the following (Any THREE)

(15M)

- (a) Explain System Calls with respect to following: definition, types and execution.
- (b) What is file management? Write the activities of operating system in regard to file management.
- (c) What are the advantages and disadvantages of threads?
- (d) Discuss Layered Approach in comparison with Kernel based Approach.
- (e) Explain the term cooperating processes. What are the advantages of the same?
- (f) State and explain various multithreading models.

Q. 3 Attempt the following (Any THREE)

(15M)

- (a) Consider the following table. Calculate average waiting time and turnaround time using SJF. (use non-pre-emptive technique)

Process	Arrival Time	Burst Time
P1	0	07
P2	4	04
P3	6	03
P4	8	04
P5	8	04

- (b) What is a deadlock? State necessary and sufficient conditions for the same.

(c) Explain semaphores with respect to following points:

- 1) definition
- 2) counting semaphore
- 3) binary semaphore
- 4) wait operation
- 5) signal operation

(d) Assume

- 1) Total resources in system:

A B C D

6 5 7 6

- 2) Available system resources are:

A B C D

3 1 1 2

- 3) Processes (currently allocated resources):

A B C D

P1 1 2 2 1

P2 1 0 3 3

P3 1 2 1 0

4) Processes (maximum resources):

A B C D

P1 3 3 2 2

P2 1 2 3 4

P3 1 3 5 0

Compute the need array and check whether system is under safe state or not. Also find safe sequence.

(e) Explain the following concepts:

(1) Starvation (2) aging (3) TAT (4) waiting time (5) CPU utilization

(f) Explain critical section problem in brief.

Q. 4 Attempt the following (Any THREE)

(15)

(a) Write a note on SCAN and C-SCAN scheduling algorithm.

(b) Explain the concept of page fault. How the same can be handled by OS?

(c) Consider the following page references string and find total number of page faults using LRU and FIFO where page frame size is 3.

c d e d e f c e d f

(d) State and explain different attributes of file.

(e) Disk request come into the disk driver for cylinder 10, 22, 20, 2, 40, 6 and 38 in that order. Find total head movements for each of the following algorithm FIFO and SRTF

(f) Write short notes on:

- 1) DMA
- 2) Polling

Q. 5 Attempt the following (Any THREE)

(15)

(a) State various responsibilities of child and parent process.

(b) Depict the gantt chart for FCFS and RR algorithm for the following problem and explain which is better? (for RR time slice is 5 units)

Process	P1	P2	P3	P4	P5
Burst time	9	15	3	8	14

(c) Write a note on Dining-philosophers problem.

(d) Define the following terms:

- 1) Seek time
- 2) Rotational latency
- 3) Access time
- 4) Transfer time
- 5) Page fault

(e) State and explain various techniques of free space management.

(2 ½ Hours)

[Total Marks: 75]

- N.B. 1) All questions are compulsory.
 2) Figures to the right indicate marks.
 3) Illustrations, in-depth answers and diagrams will be appreciated.
 4) Mixing of sub-questions is not allowed.

Q.1 Attempt All (Each of 5 Marks)

(15M)

(a) Select correct answer from the following:

- A set with zero characters as a string is called _____ string.
 (a) Null (b) Unit (c) binary (d) ternary
- A set of minimum edges required to delete for disconnected graph.
 (a) Flow (b) Cut set (c) bridges (d) none
- Chromatic number of a complete graph with n vertices is _____.
 (a) $n!$ (b) n (c) $n+1$ (d) $n-1$
- A network is a _____ graph.
 (a) discrete (b) Regular (c) Connected (d) Multigraph
- The amount of material flowing into a vertex v must _____ to the amount flows out of the vertex.
 (a) equal (b) Less than (c) Greater than (d) None

(b) Fill in the blanks:

(Degree, string, 8!, , 2!, increase, saturated, Flow, 9, Parallel)

- The number of permutations of the letters in the word COMPUTER is _____.
- The value of $C(7, 2)$ is _____.
- If $N = (V, E)$ is a transport network, a function f from E to the nonnegative integers is called a _____.
- If two or more edges have same terminal vertices then these edges are called _____ edges.
- Ramsey number, $R(3, 4) =$ _____.

(c) Define the following.

- Binomial Theorem
- Addition rule in counting problems
- Planar graph
- Clique
- Saturated edge

Q.2 Attempt the following (Any THREE)

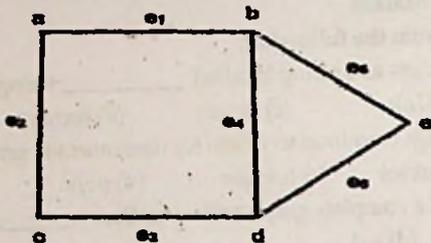
(15M)

- A farmer buys 3 cows, 2 goats and 4 hens from a man who has 4 cows, 3 goats and 8 hens. How many choices does the farmer have?
- Determine the coefficient on xyz^5 in the expansion of $(x + y + z)^7$
- Prove that the sum of first n natural numbers is $\frac{n(n+1)}{2}$.
- Determine all integer solutions to the equation $x_1 + x_2 + x_3 + x_4 = 7$, where $x_i \geq 0$ for all $1 \leq i \leq 4$

- (e) What is Sudoku puzzle? Explain the easiest way to solve Sudoku puzzle and write its three benefits.
- (f) For each $n > 0$, prove that $\binom{n}{0} + \binom{n}{1} + \binom{n}{2} + \dots + \binom{n}{n} = 2^n$

Q. 3 Attempt the following (Any THREE) (15M)

- (a) Explain colouring of graph and Chromatic numbers? Find the chromatic number of the given graph

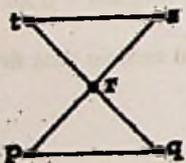


- (b) Define a regular graph. Draw a regular graph with five vertices
- (c) State and prove Ramsey's theorem.
- (d) Define adjacency matrix representation of a graph also draw the graph for

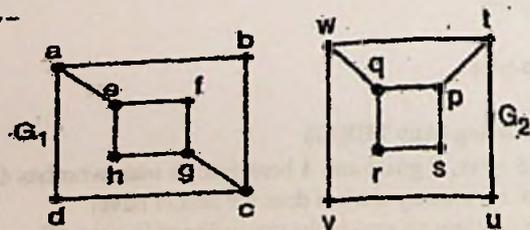
the given adjacency matrix.

$$\begin{bmatrix} 0 & 1 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 \end{bmatrix}$$

- (e) Define Euler's path, Euler's circuit and Euler's graph also find an Eulerian circuit in the given graph.

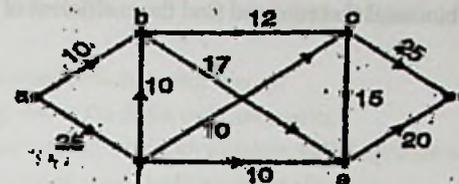


- (f) Explain isomorphism of graphs, Check whether the two graphs G1 and G2 are isomorphic or not.

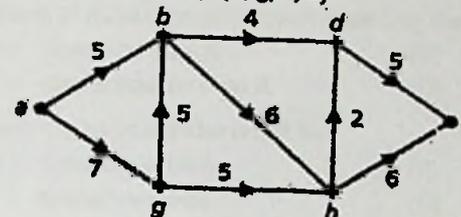


Q. 4 Attempt the following (Any THREE) (15)

- (a) Use Ford-Fulkerson algorithm to find the maximum flow for the following network:



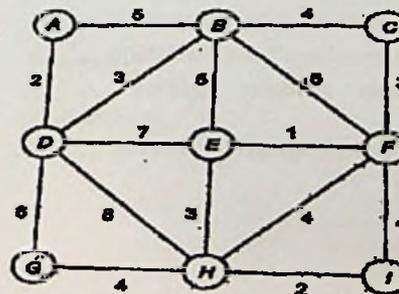
- (b) Define the capacity of cuts. Find the capacity of the cut (P,Q), where $P = \{a, b\}$ and $Q = \{d, g, h, z\}$



- (c) What is a complete matching? Explain with an example.
- (d) Write permutations shown below in cycle notation, compute $\pi_1 \pi_2$ (product of two permutations) and inverse of π_1 .
 $\pi_1 = (a b c d e f), \pi_2 = (a b c d e f)$
 $\pi_1 = (e f d a b c), \pi_2 = (f c a e d b)$
- (e) Suppose we are colouring the vertices of the square using black and white colour. Draw the colouring fixed by all possible transformations and explain it in brief.
- (f) What is the integer solution of linear programming problems?

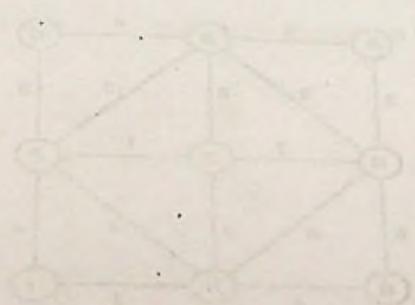
Q. 5 Attempt the following (Any THREE) (15)

- (a) From a standard deck 52 cards, In how many ways we can draw three cards in succession without replacement?
- (b) Find minimum spanning tree of following graph using Kruskal's algorithm.



- (c) Explain Polya's enumeration formula.

- (d) Explain Burnside's Lemma
 (e) Expand $(x + y)^7$ using binomial theorem and find the coefficient of x^6y .



(2½ Hours)

[Total Marks: 75]

- N.B. 1) All questions are compulsory.
 2) Figures to the right indicate marks.
 3) Illustrations, in-depth answers and diagrams will be appreciated.
 4) Mixing of sub-questions is not allowed.

Q.1 Attempt All. (Each of 5Marks)

(15M)

(a) Multiple Choice Questions:

- (i) Which of these is correct way of inheriting class A in class B?
 (A) class B inherits A (B) class B extends A
 (C) class B inherits class A (D) class B extends class A
- (ii) Static variables are also called as:
 (A) instance variables (B) object variables
 (C) special variables (D) class variables
- (iii) Which of the following class can be used to read characters from a file?
 (A) FileReader (B) ObjectInputStream
 (C) FileWriter (D) InputStreamReader
- (iv) Which of these methods return description of an exception?
 (A) getMessage() (B) getException()
 (C) printException () (D) printMessage()
- (v) Which of these packages contains all the classes and methods required for event handling in Java?
 (A) java.applet (B) java.awt
 (C) java.awt.event (D) java.event

(b) Fill in the blanks:

(Long, new, final, setText(), java.net, malloc, Number, static, java.util, getText())

- (i) _____ keyword can be used to prevent method overriding.
 (ii) _____ is a super class of Byte and Short wrapper classes.
 (iii) _____ operator is used to allocate memory for an object.
 (iv) _____ package contains classes and interfaces for network programming.
 (v) _____ method can change the text in a Label.

(c) Answer in 1 - 2 sentences:

- (i) What is the purpose of final keyword when used with a variable.
- (ii) What is a package?
- (iii) What is meant by serialization?
- (iv) What is purpose of wait() method in multithreading?
- (v) What is an inner class in Java?

Q. 2 Attempt the following (Any THREE)

(15M)

- (a) What is type casting? Why is it required? How is it achieved in Java?
- (b) Explain various access specifiers that can be used in Java.
- (c) Explain different ways in which 'super' keyword can be used in Java.
- (d) Differentiate between an interface and a class.
- (e) Create a class Complex with the following members:
 - (i) two fields of type double to store the real and imaginary part of the complex number
 - (ii) constructor(s) to initialize the complex number
 - (iii) method that adds two complex numbers and returns the result
- (f) Create a class Box with fields for storing height, width and depth of a box. Write parameterized constructor with values of height, width and depth given as parameter. Add a method for calculating the volume of the Box. From the Box class inherit a class WeightBox that adds a field weight to the class. Write an appropriate constructor. In another class write main method to create an object of WeightBox and calculate its volume.

Q. 3 Attempt the following (Any THREE)

(15M)

- (a) What is the purpose of throw keyword in exception Handling. Illustrate with an example.
- (b) What do you understand by multithreading? Explain how to create thread using Thread class.
- (c) Explain any two byte-stream classes that can be used for reading content from a file.
- (d) What is the purpose of ServerSocket class? Explain any two constructors and two methods of ServerSocket class.
- (e) Write a program that accepts two numbers a and b as command-line arguments, and calculates a/b. The program should handle an appropriate exception if value of b is 0.
- (f) Write a client-server program that accepts a user name from the client and sends a greeting message 'Hello, <username>' to the client.

Q. 4 Attempt the following (Any THREE)

(15)

- (a) What is the purpose of CheckboxGroup class in Java? How to use it in AWT programming?
- (b) Explain Set interface and any one of its implementation class.
- (c) Explain the concept of Anonymous inner class. Give example to illustrate.
- (d) What are type wrappers? Explain any 3 methods that can be used with Double class. Illustrate with suitable examples.
- (e) Write a program that displays names of any four operating systems in a list box, and the selected operating system should get displayed in a label.
- (f) Write a program to create an ArrayList containing names of five states of India, and then displays them.

Q. 5 Attempt the following (Any THREE)

(15)

- (a) Explain the concept of abstract classes in Java.
- (b) What is a string? Explain, with example, the following methods of String class:
 - (i) indexOf()
 - (ii) substring()
- (c) Explain how try-catch keywords are used for exception handling.
- (d) What is thread synchronization? How is it achieved in Java?
- (e) Write a note on Event-Delegation model.

(2½ Hours)

[Total Marks: 75]

- N.B.: 1) All questions are compulsory.
2) Figures to the right indicate marks.
3) Illustrations, in-depth answers and diagrams will be appreciated.
4) Mixing of sub-questions is not allowed.

1. Attempt All (Each of 5 Marks) :

(15)

(a) Multiple Choice Questions

- 1) The difference between rollback and commit is -----
 - A. commit saves transaction, rollback undoes it.
 - B. commit undoes the transaction, and rollback saves it.
 - C. commit loads transaction and rollback saves it.
 - D. none of the above

- 2) PL/SQL is a procedural language that has following advantages -----
 - A. Integration with database
 - B. Better performance
 - C. Support for Transaction Processing
 - D. All of the mentioned above

- 3) SQL statements that must end transaction are of type -----
 - A. 2 types
 - B. 3 types
 - C. 4 types
 - D. 5 types

- 4) Term that is known to commit current transaction, is -----
 - A. Rollback work
 - B. Commit work
 - C. Trace work
 - D. Transit work

- 5) A term that consists of a sequence of query and/or update statements, is known as -----
 - A. Transactions
 - B. Data commit
 - C. Data rollback
 - D. Data automation

- (b) Fill in the blanks (currval, drop index, Binary large object, rowid, ||)
1. In sequence, the recent value is seen by -----
 2. Data type BLOB stands for
 3. To drop an index we use ----- statement.
 4. Compound symbols..... are use in dbms_output.put_line as a separator.
 5. In Sequence the current value is seen by

(c) Answer in 1 – 2 sentences

1. How to declare a function?
2. Give an example where : old and :new are used.
3. What is the use of EXIT statement?
4. Define views.
5. Define Primary index.

2. Attempt the following (Any THREE)

- (a) Generate the trigger to generate the primary key values for product_id in the products (prod_id, pname, p_price) table and display the values in the table.
- (b) How to create an index? Explain with an example.
- (c) Employees of the testing department in the Perpetual Systems does testing of the software and result is taken as test-id, test-name, date_of_testing, test_result. Execute the procedure to insert the values in the table "test_specifications".
- (d) Explain heap file organization.
- (e) How to create and execute stored procedure?
- (f) Write a short note on using DDL statements in trigger by giving an example

3. Attempt the following (Any THREE)

- (a) Write a PL/SQL block that will accept an account number from the user, check if the users balance is less than minimum balance, then deduct Rs. 1000/- from the balance. Refer the table accts(acctno, current_balance, updt_balance)
- (b) Explain declaration and assignment in PL/SQL along with explanation of Begin block.
- (c) Explain PL/SQL data types.
- (d) Explain case statement with an example.
- (e) Write a PL/SQL block that calculate the area of circle for a value of radius varying from 3 to 7. Store the radius and the corresponding values of calculated area in an empty table name areas (radius, area).
- (f) Explain GOTO and NULL statement with an example.

4. Attempt the following (Any THREE)

(15)

- (a) Define and explain ACID.
- (b) Explain two phase commit protocol.
- (c) What is lock? Explain it along with its types.
- (d) Differentiate between serial schedule and serializable schedule with example.
- (e) Explain shadow paging and log based recovery scheme.
- (f) Describe Aries Algorithm.

5. Attempt the following (Any THREE)

(15)

- (a) Create table simple interest (p_amt, no_of_yr, rate_int, simp_int) calculate simple interest and update table using for loop for 3 values.
- (b) Explain the concept of transaction.
- (c) Describe Features of PL/SQL.
- (d) Explain cluster file organization.
- (e) Define indexes? Explain with an example creating and dropping of indexes.

(2 1/2 Hours)

[Total Marks: 75]

- N.B.
- 1) All questions are compulsory.
 - 2) Figures to the right indicate marks.
 - 3) Illustrations, in-depth answers and diagrams will be appreciated.
 - 4) Mixing of sub-questions is not allowed.

Q.1 Attempt All (Each of 5Marks)

(15M)

(a) Multiple Choice Questions.

1. _____ command potentially offers a fine-grained choice of permissions for users and groups to access portions of the admin-user's powers

- (a) grep (b) mkuser (c) sudo (d) ls

2. Which one of the following is not an HTTP Method

- (a) GET (b) POST (c) UNDO (d) DELETE

3. The command _____ sets the last-modified time-stamp of the specified file(s) or creates it if it does not already exist.

- (a) set date-time (b) set time (c) date-time (d) touch

4. _____ is Tools for achieving security

- (a) Virtual Private Networks (b) TRIG security (c) MQTT (d) DDoS

5. LED stands for _____

- (a) Light Emitting Diode (b) Light End Diode

(b) Fill in the blanks

{2, Hard Disk, do not connect, cross compiler, do not communicate, 5,10, monitor, connecting }

1. DASH7 provides multi-year battery life, range of up to _____ km.
2. The disadvantage of Raspberry Pi is, it does not have a _____ associated with it
3. The breadboard is a way of _____ electronic components to each other without having to solder them together.
4. In GPIO, DNC stands for _____.
5. A _____ is a compiler that runs on one platform/architecture but generates binaries for another platform/architecture

(c) Answer in 1-2 sentences

1. What is GND in GPIO.
2. State the full form of ASIC.
3. List stages of 3-stage pipeline organisation.
4. What is SenseIoT
5. What is REST ?

P.T.O.

Q.2 Attempt the following (Any THREE)

(15M)

- (a) Define Raspberry pi hardware.
- (b) Write a short note on Graphic Processing Unit (GPU)
- (c) What is SoC? Discuss the structure of SoC.
- (d) Explain Compute Unit with block diagram.
- (e) Define steps of configuring boot sequence and hardware.
- (f) Define SoC products and explain FPGA.

Q.3 Attempt the following (Any THREE)

(15M)

- (a) Discuss any one Programming interface used with Raspberry Pi.
- (b) Write a short note on free open source Raspbian OS.
- (c) Explain the following Linux commands: rmdir, touch, mv, cp, chmod.
- (d) What is node.js? Explain benefits of node.js.
- (e) Define and explain with an example Pulse Width Modulation.
- (f) What is python? Explain its features?

Q.4 Attempt the following (Any THREE)

(15M)

- (a) Write a short note on Security tools for IoT.
- (b) Explain XMPP protocol used in IoT communication with block diagram.
- (c) What is the role of CoAP protocol in IOT.
- (d) Write a python program and diagrammatically represent circuit connection to blink an LED using raspberry pi kit.
- (e) Explain the following tools:
 - 1.VPN
 - 2.X.509 certificates and encryption.
- (f) Discuss any two real-time applications of IoT.

Q.5 Attempt the following (Any THREE)

(15M)

- (a) Explain ARM8 architecture with block diagram.
- (b) Explain following terms:
 - 1. Booth multiplier
 - 2. Register file
- (c) Explain IoT security in detail.
- (d) Define GPIO programming.
- (e) Explain Carriots as IoT service platform in embedded designing.

04/11/2018

(2½ Hours)

[Total Marks: 75]

- N.B. 1) All questions are compulsory.
 2) Figures to the right indicate marks.
 3) Illustrations, in-depth answers and diagrams will be appreciated.
 4) Mixing of sub-questions is not allowed.

Q. 1 Attempt All (Each of 5 Marks)

(15M)

(a) Multiple Choice Questions

(5M)

- i. The tag used to create a client side image map
 A. <MAP> B. <USEMAP> C. <LINK> D. None of these
- ii. In JavaScript, "return" and "case" are
 A. Keywords B. Data-types C. Prototypes D. Declaration statements
- iii. Which of the following sets what kind of line decorations are added to an element, such as underlines, overlines, etc?
 A. text-style B. text-decoration C. text-line D. text-decoration-line
- vi. The global object constructor for strings or a sequence of characters.
 A. String B. RegExpClass C. RegExp D. StringExp
- v. What will be the output of the following PHP code?

```
<?php
$a = 10;
$b = 10;
$c = 10;
echo ($a === $b and $a == $b);
```

 A. ?>True B. Error C. False D. 1

(b) Fill in the blanks

(5M)

(\$(Dollar), object-based, verify, Javascript and Java, opening new document, objective, transport, Javascript and XML, _self, client side, exponentiation, Asynchronous JavaScript and XML)

- i. JavaScript is often used for _____ validation.
- ii. In PHP language variable starts with _____.
- iii. In PHP script operator '***' indicates _____.
- iv. AJAX stands for _____.
- v. Target attribute _____ is used to display response in same frame.

(c) Write Answers in two lines.

(5M)

- i. What is the role of CSS selector?
- ii. Explain <select> tag
- iii. PHP session
- iv. State any two functions from the JavaScript Math object.
- v. Table tag in HTML

Q.2 Attempt the following (Any THREE)(Each of 5Marks) (15M)

- Explain any five text formatting tags in HTML5.
- What is Stylesheet? List its types. Explain any ONE with an example.
- Explain the following tags in HTML5 with an example:-
 - ``
 - `<link>`
 - `<div>`
 - ``
 - `<title>`
- Which are the CSS properties to work with background of a Page in HTML? Give its purpose with an example.
- Write HTML code to generate a form accepting the user last name (textfield), contact number(textfield), gender (radiobutton), hobbies (checkbox), country (dropdown) and buttons for resetting and submitting the form.
- Write an HTML and CSS code for the following:-

	Average Marks		Aggregated Average Marks
	Theory	Practical	
Male students	70	78	74%
Female students	80	81	82.5%

Q.3 Attempt the following (Any THREE)(Each of 5Marks) (15M)

- Explain the following with valid example:
 - `alert()`
 - `prompt()`
- What is the purpose of Location browser objects in JavaScript? Explain its three properties.
- Write a short note on XML DTD.
- Explain the following elements w.r.t XSLT with an example:
 - `xsl:attribute`
 - `xsl:value-of`
 - `xsl:attribute-set`
- Describe Document Object Model with diagram.
- Write a JavaScript code to read a number from a text filed and check if it is Armstrong Number or not (Assume the input to be always three digit number).

Q.4 Attempt the following (Any THREE)(Each of 5Marks) (15M)

- Explain any two functions used for animation in jQuery.
- Write a PHP code to check given number is positive, negative or Zero. The number is to be accepted from HTML form.

- Explain the following jQuery traversing methods:-
 - `filter()`
 - `end()`
 - `contents()`
 - `find()`
 - `first()`
- What is the purpose of XMLHttpRequest object in AJAX? How to open it in AJAX? Explain.
- What is a PHP session? How to start, get, modify and destroy a PHP session? Give example.
- Explain the following functions w.r.t database handling in PHP:-
 - `mysql_connect()`
 - `mysql_tablename()`
 - `mysql_ping()`
 - `mysql_list_fields()`
 - `mysql_drop_db()`

Q.5 Attempt the following (Any THREE)(Each of 5Marks) (15M)

- Write a code using PHP and HTML to accept department id from user and display department name and address in a table.
[Table: Department (Deptid number (3), Deptname varchar (20), Deptaddress varchar2 (10))].
- Diagrammatically explain AJAX Web Application Model.
- How does AJAX handle asynchronous data transfer?
- What is the purpose of following CSS properties?
 - `text-align`
 - `font-style`
 - `border`
 - `font-size`
 - `display`
- Explain any five PHP Comparison Operators.
