

- N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

- 1. Attempt any two of the following: 10**
- What four requirements were defined for Kerberos?
 - Describe transport mode and tunnel mode.
 - What is Application Level Gateway? Explain its working
 - Explain the header format of MIME messages.
- 2. Attempt any three of the following:**
- Define the following:
(i)Cryptography (ii)Symmetric encipherment (iii) Asymmetric Encipherment
 - Explain the working of DES.
 - Define Cryptosystem. Explain it with suitable diagram.
 - What is shift cipher? Explain with simple example
 - List some of the components of modern block cipher.
 - Explain p-1 factoring algorithm.
- 3. Attempt any three of the following: 15**
- Explain "ElGamal signature scheme"
 - Write a note on Digital signature
 - Explain Fail-stop signatures in detail.
 - Explain Blom's scheme of key distribution.
 - Write a short note on station-to-station protocol.
 - Explain Diffie-Hellman Key exchange algorithm.
- 4. Attempt any three of the following: 15**
- Define Computer Security. Explain the necessity of computer security.
 - What are the problems of computer security mechanism?
 - Describe CIA Triad of computer security.
 - List & explain the categories of security mechanism of x.800.
 - Explain the following terms:
i)Authentication ii)Access Control iii)Non-Repudiation
 - What are active attacks? Discuss various passive attacks.

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5. **Attempt any three of the following:** 15
- a Explain the general format of PGP message.
 - b What are three threats associated with user authentication over a network?
 - c Write short note on Kerberos.
 - d What are the various Web security protocols?
 - e What are the operational services of PGP? Explain any one.
 - f In S/MIME, explain how Bob and Alice exchange the secret key for encrypting messages.
6. **Attempt any three of the following:** 15
- a. What are the groups of IP security document?
 - b. What services are provided by IPsec?
 - c. Describe anti-relay attack.
 - d. Compare transport mode with tunnel mode of IP.
 - e. Describe ESP packet format.
 - f. What are the advantages of IP security?
7. **Attempt any three of the following:** 15
- a. What is DMZ? Explain the importance of DMZ.
 - b. What is the context of UNIX password scheme?
 - c. How are viruses different from worms and Trojan horses?
 - d. What are the typical phases of operation of virus or worm?
 - e. What are the advantages and disadvantages of Application Level Gateway? How is it different from circuit level gateway and packet filter firewall?
 - f. What is DOS? How is DOS different from DDOS?
-

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- 1. Attempt any two of the following: 10**
- Explain the concept of private and shared assembly.
 - Distinguish between abstract class and interface.
 - What is namespace? Explain System namespace.
 - Explain the different keywords used for interrupting the loops.
- 2. Attempt any three of the following:**
- What is .NET framework? Explain in detail .NET framework 4.0 with diagram.
 - What are interfaces? Write a program to show the implementation of multiple interfaces.
 - What are sealed classes and sealed methods? Why are they used?
 - Explain the implicit and explicit conversion of data types with examples.
 - What are indexers? Explain with example.
 - Explain Write() and WriteLine() Methods with examples..
- 3. Attempt any three of the following: 15**
- What are the different types of collections in .NET? Explain.
 - Explain Sorted, SelectedMode, MultiColumn, SelectedItem and SelectedIndex properties of ListBox control.
 - Write a windows application to open the website mu.ac.in upon click the link. Write the necessary events and steps required for implementation. [Hint: Use LinkLabel]
 - Write a short note on Properties. Name and describe any 5 basic Properties in ASP.NET
 - Explain Group Box, Check Box and Radio button.
 - What do you mean by delegates? State its declaration, instantiation and invocation process.
- 4. Attempt any three of the following: 15**
- List the steps for creating Sitemap file.
 - Explain the different directives supported by ASP.NET.
 - Explain the use of web.config and global.asx files in ASP.NET application.
 - Explain ASP.NET page life cycle.
 - What is CSS? Explain inline and embedded CSS.
 - What are selectors in CSS? Explain the four most important types of selectors.

[Turn Over]

5. **Attempt any three of the following:** **15**
- a Explain the role of cookies in ASP.NET.
 - b Explain the role of master pages in ASP.NET.
 - c How to Use the ASP.NET Validation Control to Validate the User Input
 - d Explain the difference between Response.Redirect() and Server.Transfer() method in ASP.NET.
 - e Explain a syntax for creating sitemap file with suitable example.
 - f What are the three different ways to store data in the Cache object?
6. **Attempt any three of the following:** **15**
- a. When do you use ExecuteReader, ExecuteNonQuery, ExecuteScalar methods?
 - b. What is LINQ to Objects? Explain.
 - c. Explain in brief about Paging and Single Item Control.
 - d. Write short note on XPath.
 - e. List all the steps in order, to access a database through ADO.NET.
 - f. Explain type of joins in SQL Server.
7. **Attempt any three of the following:** **15**
- a. Explain the working of AJAX.
 - b. What does dollar symbols (\$) mean in jQuery? Explain with example.
 - c. What is web service? Explain the basic steps of creating web service.
 - d. List and explain jQuery selectors.
 - e. Explain the difference between AJAX Page Processing and Traditional Page Processing.
 - f. List any five applications where AJAX is incorporated.
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- 1. Attempt any two of the following:** **10**
- Explain VV model of Testing in brief.
 - Explain the issues in Object Oriented Testing.
 - State the advantages and disadvantages of structural testing.
 - What is benchmarking? What are its types?
- 2. Attempt any three of the following:**
- State and explain different quality factors.
 - What is defect? Why Software does have defect?
 - Differentiate between Software Quality Assurance and Software Quality Control.
 - Explain the VV model of testing.
 - State the methods or techniques of Verification. Explain any two.
 - Explain the characteristics of Big Bang Approach.
- 3. Attempt any three of the following:** **15**
- A rectangle program accepts four integers as lengths for four sides of length from 1 to 100, inclusively. The output of the program is to determine whether the inputted numbers can form a rectangle, square or neither of these. Create a decision table for the above problem with any five rules. Provide a test case for each given rule.
 - What is functional Testing? Explain its advantages and disadvantages.
 - With the help of an illustrative example, explain how decision table can be used for testing.
 - Explain equivalence class testing. How does weak normal differ from strong normal form of equivalence class testing?
 - What is retrospection? Explain with reference to functional testing.
 - Explain decision tables with an example.
- 4. Attempt any three of the following:** **15**
- Write a note on DD-Path Testing.
 - Give the significance of Structural Testing.
 - Write a note on Metric Based Testing.
 - Write a note on Du Path Test Coverage Metrics.
 - Explain the following generating adequate test sets for each:
 - Statement Coverage
 - Conditional Coverage

f. Draw a dd-path for the following piece of code.

```

1) //Program Bank Interest
2) Dim Period As Integer
3) Dim Age As Float
4) Output :( "Enter the Period and Age")
5) Input: (Period, Age)
6) Output: ("The values entered are ", Period, Age)
7) IF (Age <= 70)
8)     THEN IF (100 <= Period < 200 )
9)         THEN Output :( " Interest paid is 7%");
10)        ELSE IF (200 <= Period < 365 )
11)            THEN Output :( " Interest is 8%");
12)        ENDIF
13)    ELSE
14)        IF (100 <= Period < 200 )
15)            THEN Output :( " Interest paid is 9%");
16)            ELSE IF (200 <= Period < 365 )
17)                THEN Output :( " Interest is 10%");
18)            ENDIF
19)    ENDIF
20) END
    
```

5. Attempt any three of the following:

15

- a State and explain different levels of testing.
- b Explain the advantages and disadvantages of Bottom Up Approach.
- c "Efficiency of unit testing affects the effectiveness of testing process". Discuss.
- d Compare the objectives of Integration and Interaction Testing.
- e Explain Acceptance Testing in detail.
- f What is retrospection? Explain retrospection with respect to Unit Testing.

6. Attempt any three of the following:

15

- a Describe the feature of Object Oriented Software Testing.
- b Explain the classes as units with respect to Object Oriented Testing.
- c Discuss the aspect of polymorphism and inheritance with reference to Object Oriented Testing.
- d What is UML? Discuss UML Support for Object Oriented Integration Testing.
- e Explain different types of metric-based testing.
- f Describe verification & validation activities during coding in VV

7. Attempt any three of the following:

15

- a Define the term 'Efforts' and explain the different types of Efforts.
- b "Effectiveness of testing depends on designing good tests cases". Discuss.
- c What is the importance of a Test Report? Describe its types.
- d What are Test Cases? Explain its basic components with the help of example.
- e List the steps for Test Process Improvement.
- f Explain test process improvement in the following phases
 1. Plan 2. Do 3. Check and 4. Act

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1. Attempt any two of the following:

10

- What are Servlets? State the need and benefits.
- Explain the concept of Event Listener and also explain its types.
- Explain the concept of "Result" interface.
- State the intrinsic objects in JSP and explain any two.

2. Attempt any three of the following:

- How is event handling done in Java?
- What is JTree? What are Tree nodes and models?
- Write a swing program that creates a GUI for the order form. The order form should contain the following fields:
Text Boxes to store Customer Name, quantity of the product and price of the same.
Combo Box to select Product Name (From the list of products specified in the list).
Buttons, one to submit data and another to clear the fields.
Note: All input fields should be supported by appropriate labels.
Event: GUI design should handle windowClosing () event.
- Explain the usage of Scrollbar control in Swing.
- Explain JInternalFrame with its constructors.
- How to create directory like structure in Swing? Explain with illustration.

3. Attempt any three of the following:

15

- Explain the GenericServlet with its constructors and Methods.
- Write a servlet application to accept a number from the user and display whether the number is multiple of 3 or not.
- Explain the life cycle of servlet.
- Explain the importance of request dispatcher of servlet in inter-servlet communication.
- Write short note on HttpServlet class.
- Explain the directory structure of Web Application for executing Servlet Application.

[Turn Over]

- 4. Attempt any three of the following: 15**
- a. Write short note updatable resultset.
 - b. What are the different types of JDBC drivers? Explain.
 - c. What is scrollable resultset? Explain with example.
 - d. Explain the concept of “Character Quoting Conventions” in JSP.
 - e. Write a JDBC program that inserts values in database using prepared statement through keyboard input. [TABLE NAME: Employee. FIELDS: Empid, Name, Dept, Designation]
 - f. What are directives in JSP? Explain its types.
- 5. Attempt any three of the following: 15**
- a. Write short note on MVC architecture?
 - b. Write a JSF program to accept the employee details and store them in the database.
 - c. What is EJB? Explain the components of Enterprise bean architecture.
 - d. Write a model and navigation rules to find the simple interest of a given principal, interest and terms. (in JSF)
 - e. Explain the advantages of EJB.
 - f. How JSF applications can be built, maintained and executed?
- 6. Attempt any three of the following: 15**
- a. Explain structure of hibernate.cfg.xml.
 - b. Write a short on Interceptors in struts.
 - c. Enlist the core components of struts and explain about the interceptors.
 - d. Explain the architecture of hibernate framework in detail.
 - e. Explain the importance of mapping and show the creation of mapping file in hibernate framework.
 - f. Write a short note on “Struts framework”
- 7. Attempt any three of the following: 15**
- a. Explain different type of Mail Protocols.
 - b. Write a short note on java mail API.
 - c. Explain the components of web services.
 - d. Explain the need of directory services in detail.
 - e. What is resource injection? What are its types?
 - f. Write presentation logic and the processing servlet to dispatch the mail to the given recipient.
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1. Attempt any two of the following:

10

- a. Explain Smbclient, smbmount commands with suitable example.
b. Calculate the number of subnets, subnet mask, and number of hosts for a Class C subnet with 2 bits. Provide a tabular format of number of subnets with the following details:

Network ID	Net Mask	Broadcast	First IP	Last IP

- c. Explain the following RPM command line options:

- i. --whatrequires capability
- ii. --whatprovides capability
- iii. --requires
- iv. --provides
- v. --qf 'format_str'

- d. Explain rpm command with five options.

2. Attempt any three of the following:

- a. Explain the duties of system administrators.
- b. What is the importance of rc scripts? Explain.
- c. Explain the proc virtual file system.
- d. Explain installing & configuring application software.
- e. Write a note on backing up & restoring files.
- f. Explain the init process with emphasis on rcscripts.

3. Attempt any three of the following:

15

- a. Explain the concept of subnetting with suitable example.
- b. Write the meaning of the following lines of /etc/exports file

```
/usr/local          *.tyit.com(ro,sync)
/var/spool/mail      192.168.0.1(rw)
/opt/vpb             192.168.0.1(rw,no_subtree_check)
```

[Turn Over]

- c. Explain the concept of Classless InterDomain Routing.
- d. What is dhcp? How is it configured?
- e. How are NFS server and client configured?
- f. State and explain the three files that are needed to be modified on each computer in the network in addition to configuring the network cards.

4. Attempt any three of the following:

15

- a. Write and explain the steps to configure the time server.
- b. Explain use of ssh, scp, sftp services
- c. How is xinetd configured? Explain.
- d. What are the sections of smb.conf file? Explain.
- e. What is a caching proxy server? Explain squid and state the steps involved in its configuration process.
- f. Explain the smbmount and smbclient commands of samba.

5. Attempt any three of the following:

15

- a. Explain zone files with example.
- b. Write the steps for time server configuration.
- c. What is the use of ssh, scp, sftp services.
- d. List and explain different types of domain name servers.
- e. Differentiate between IMAP4 and POP3?
- f. Write a note on the statements of the /etc/named.conf file.

6. Attempt any three of the following:

15

- a. List the Mailman configuration categories. Write the purpose of any four.
- b. Write a CGI page that will display the listing of the directory /home/tyit.
- c. List and explain the common mailman administrative tasks.
- d. Explain in detail the usage of /etc/aliases file.
- e. Explain the <Directory> block of web configuration file.
- f. Write the purpose of any five Mailman configuration categories.

7. Attempt any three of the following:

15

- a. Explain how DNS service can be optimized?
- b. What is the use of up2date agent? Write the meaning of the Alert icon that represent state of the update i) Blue check mark ii) Green double arrows iii) Red Exclamation Point iv) Gray Question Mark
- c. Explain the quotacheck command with example.
- d. Explain with example how to create a new group?
- e. How can CGI be enabled with Apache?
- f. Explain the password database file /etc/passwd describing its fields.