T.Y.B.SC. (IT) [SEM –V]
Network Security
(May-2017)

Q.P. Code : 360900

(3 Hours)   Total Marks : 100

Note : 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**
   a) Write a note on Security mechanism
   b) What is Kerberos? Explain.
   c) Explain the SSL architecture and explain the SSL protocol stack.
   d) What is DDOS attack? What are the ways in which DDOS attack can be classified?

2. Attempt **any three** of the following: **15**
   a. Give the difference between Symmetric and asymmetric encryption.
   b. Give the general structure of DES algorithm. Explain the various mode of operation.
   c. Explain the RSA cryptosystem.
   d. Explain Vigenere Cipher. Encrypt the following text using vigenere cipher with keyword MUMBAI
           "TOMORROW IS A NEW DAY"
   e. Define entropy. Explain the properties of entropy.
   f. What is cryptanalysis? Explain the cryptanalysis of DES

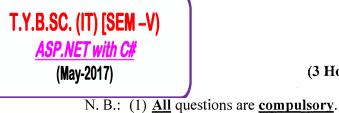3. Attempt **any three** of the following: **15**
   a. Explain the MD4 algorithm for message digest generation.
   b. Explain the digital signature standard.
   c. Explain the Diffie-Hellman key exchange algorithm
   d. What are the different cryptographic hash function criteria?
   e. What is key predistribution? Explain the concept.
   f. Write a note on Fail-stop signatures.

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4. Attempt **any three** of the following: **15**
   a. Describe the various security services.
   b. What is the various security attacks identified under the OSI security architecture? Explain.
   c. Explain the security mechanism defined by X.800.
   d. What is nonrepundiation? Explain with the help of an example.
   e. Explain the model for Network Security.
   f. Explain the challenges involved in establishing computer security.

5. Attempt **any three** of the following: **15**
   a. How is the certificate processing carried out by S/MIME?
   b. What is PGP protocol used for? Explain its features.
   c. When is the user certificate revoked in X.509? Explain each scenario.
   d. Write a note on Compression in PGP.
   e. What are the three enhanced security services proposed for S/MIME?
   f. Explain the authentication procedures used by X.509.

6. Attempt **any three** of the following: **15**
   a. What is ESP used for? Explain the ESP format in detail.
   b. Explain the basic combination of security association. What is the advantage of combining the security associations?
   c. What is SSL Record protocol? Explain its operations.
   d. State the areas where SET protocol can be used. Summarize the participants in SET system.
   e. Write a note on ISAKMP.
   f. Write a note on TLS.

7. Attempt **any three** of the following: **15**
   a. Explain the various ways in which a password file can be protected.
   b. Explain the architecture of Distributed intrusion detection.
   c. What are malicious programs? Give its classification.
   d. Write a note on Trojan horse.
   e. What are firewalls? What are its characteristics?
   f. What the various firewall configurations possible? Explain any one in detail.

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1.   **Attempt _any two_ of the following:**   **10**
a.   Explain the .NET Framework.
b.   Write a short note on Assembly.
c.   Explain the RangeValidator control.
d.   Write a program to check whether the entered number is palindrome number or not.

2.   **Attempt _any three_ of the following:**   **15**
a.   Explain the components of Assembly.
b.   Write a short note on CIL and JIT Compiler.
c.   What is Namespace? Explain any four Namespaces.
d.   Write the naming rules and conventions of the variable.
e.   Explain Garbage Collector.
f.   Write a program that places double quotation marks around each word in a string.

3.   **Attempt _any three_ of the following:**   **15**
a.   Write a short note on Delegate.
b.   Explain the different types of Collections in .NET.
c.   Explain the Comparison and Logical operators in C#.
d.   Explain List Box control with any four properties.
e.   What is the use of the menus and toolbars in Windows Application? Explain.
f.   Explain the TextBox control with any four Properties

4.   **Attempt _any three_ of the following:**   **15**
a.   Explain the ASP.NET Life Cycle.
b.   Write a short note on Themes.
c.   What is CSS selector? Explain any four selectors present in CSS.
d.   Explain the global.asax files in ASP.NET application.
e.   What is CSS? Explain the Inline and Embedded CSS.
f.   Write a short note on Server side State management.

5.   **Attempt _any three_ of the following:**   **15**
a   Explain the Menu navigation control with its properties.
b   Explain the Master Page and Content Page.
c   Explain the TreeView site navigation control
d   Explain the different Access Modifiers.
e   What is the use of Compare validator? Explain it along with its properties.
f   What is regular expression? Explain regex patterns.

6.   **Attempt _any three_ of the following:**   **15**
a.   Explain ADO.NET objects.
b.   List all the steps in order to access a database through ADO.NET.
c.   What are the different ways to implement LINQ.

d.   What is Authentication? Explain its different types.
e.   Write a short note on Authorization.
f.   List and explain any four different query operators in LINQ

7.   Attempt _any three_ of the following: **15**
a.   Write a short note on JQuery.
b.   What is ASP.NET AJAX?Explain the working of AJAX.
c.   What are the different types of selectors present in JQuery.
d.   Explain DOM manipulation methods in JQuery.
e.   Explain the Timer control with its attributes.
f.   Explain the use of UpdateProgress control in AJAX.

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1. Attempt any **two** of the following :—   **10**
    (a) Explain the BIG BANG approach of testing.
    (b) Explain brainstorming process.
    (c) How to write good test case ?
    (d) What are the characteristics of good requirements ?

2. Attempt any **three** of the following :—   **15**
    (a) Define quality. Discuss the customer's view of quality.
    (b) Differentiate between 'Q' organisation and 'q' organisation.
    (c) Describe any one software development model in detail.
    (d) What are the principles of software testing ? Discuss.
    (e) Define testing. Why testing is necessary ?
    (f) Explain VV model for testing with diagram.

3. Attempt any **three** of the following :—   **15**
    (a) What is boundary value testing ? List all the limitations of boundary value testing.
    (b) Explain the concept of equivalence class testing with an example.
    (c) What is decision table based testing. Where it can be used and list the components of decision based testing.
    (d) Differentiate between strong equivalence class testing and weak equivalence class testing.
    (e) Discuss the advantages and disadvantages of decision table based testing.
    (f) Write the guidelines for boundary value testing.

4. Attempt any **three** of the following :—   **15**
    (a) What are the coverage criteria ? Explain the testing process of data flow.
    (b) Discuss the Data Flow anlysis anomalies.
    (c) Explain the concept of program graph with an example.
    (d) Describe metric based testing.
    (e) Discuss the fou steps method devised by McCabe to carry out basis path testing.
    (f) Write a short note on LOOP Coverage.

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5.   Attempt any **three** of the following :—   **15**
   (a)   What are the levels of testing ? Explain.
   (b)   What is integration testing ? List all the integation testing strategies. Explain any one.
   (c)   List all advantages and disadvantages of call graph integration testing.
   (d)   Briefly explain the concept of system testing.
   (e)   Define the tem 'Interaction'. Discuss Taxonomy o interactions.
   (f)   Define Theads. What are the distinct levels of threads ?

6.   Attempt any **three** of the following :—   **15**
   (a)   Explain Object oriented testing.
   (b)   Discuss the relationship between collaboration diagrams and sequence diagrams.
   (c)   How object oriented integration testing is different from object oriented testing.
   (d)   Discuss the implications of composition and encapsulation.
   (e)   Write a short note on class testing.
   (f)   What is UML based system testing ? Explain.

7.   Attempt any **three** of the following :—   **15**
   (a)   Define Test Policy. Explain the general content of Test Policy.
   (b)   What is Test Plan ? What are the benefits of Test Plan.
   (c)   Describe the purpose of Test Reports.
   (d)   Explain benchmarking concept. Why it is requied ?
   (e)   Differentiate between qualitative data and quantitative data.
   (f)   Explain the concept of checklist.

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1. Attempt **any two** of the following: **10**
   a)   What are JSP elements? Explain directives in the category.
   b)   Explain the role of interceptors in struts.
   c)   What is progress bar in swing? Explain the importance of it with code specification.
   d)   Explain the local and remote interface view strategy of EJB.

2. Attempt **any three** of the following: **15**
   a.   Explain about the creation of table in swing.
   b.   Explain about the usage of JSplitPane component.
   c.   Explain the concept of JColorChooser in brief. Add suitable illustration to it.
   d.   "Swing Components are light-weight components"-Explain this statement.
   e.   Explain how to create dialog boxes such as message box and input box.
   f.   Explain about the creation of "Hierarchical Tree Structure" of swing.

3. Attempt **any three** of the following: **15**
   a)   What is CGI? What are the issues that it has? Explain.
   b)   Explain the life cycle phases of Servlet.
   c)   Write a Servlet that prints the reverse of the given number.
   d)   Write an exhaustive note on "HTTP Session".
   e)   How a Servlet does redirection of pages? Add suitable illustration to it.
   f)   Write a Servlet to find the cube root of the given number.

4. Attempt **any three** of the following: **15**
   a)   Write the advantages of JDBC API.
   b)   Explain how to insert dynamic values onto the backend table. Which subclass of Statement is used for the same?
   c)   Explain how JSP works.
   d)   Write ajsp to find the square root of the given number. Accept number through html
   e)   Explain <jsp:usebean>, one of the action tags of JSP.
   f)   Explain the term "Character Quoting Conversions".

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5. Attempt **any three** of the following: **15**
   a) What is JSF? Explain the features of JSF 2.0?
   b) Explain the concept of result interface.
   c) Write a short note on EJB container.
   d) What are the different types of EJB? Explain
   e) What is facelet? How it is controlled by facelet controller?
   f) What are the advantages of EJB? Explain.

6. Attempt **any three** of the following: **15**
   a) What is Struts? Explain the application flow of MVC pattern of struts.
   b) Explain the role of OGNL in struts.
   c) Explain the relationship between hibernate application and the database.
   d) Give the code specification of hibernate.cfg.xml that holds the connection details of customer table of company database.
   e) Create a simple struts application that prints the result page from an appropriate action.
   f) Explain the significance of hibernate framework.

7. Attempt **any three** of the following: **15**
   a) Explain the concept of Resource Injection.
   b) Draw and explain the architecture of web services.
   c) What are the contents of Java mail API? Explain.
   d) Explain the significance of JNDI.
   e) Write a session bean java source code to send the mail to the given recipient.
   f) How to access the web services that we created already? Explain the steps m creating the client.

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     (5) **Draw** neat labeled **diagrams** wherever **necessary.**
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1. Answer **any two** of the following: **10**
     (a) Explain Smbclient, smbmount commands with suitable example.
     (b) Exlplain the use of cron files.
     (c) Explain the concept of subnetting with example.
     (d) Write a short note on GRUB.

2. Attempt **any three** of the following: **15**
     (a) Write the importance of rc scripts.
     (b) Explain the concept of runlevel used in Linux.
     (c) What is RAID? Write different types ofRAID. Explain various levels of RAID.
     (d) Write the purpose of any five directories of/ .
     (e) Write the basic steps used to boot the system.
     (f) Write the duties of system administrator.

3. Attempt **any three** of the following: **15**
     (a) Explain the concept of NFS with suitable example.
     (b) What is CIDR ? Explain with suitable example.
     (c) Explain the concept of DHCP with example.
     (d) Write the advantages and disadvantages of NFS.
     (e) Explain any five NFS export options.
     (f) List various files used in Linux to add a system to network. Explain.

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4. Attempt **any three** of the following: 15
    (a) Write the steps to configure squid.
    (b) Explain how to optimize samba service?
    (c) Write the purpose of various NTP utility programs.
    (d) List options of the global section of samba configuration file. Also write the purpose of each.
    (e) List the secure services and explain them with suitable example if any.
    (f) Explain the scp and sftp services with suitable example.

5. Attempt **any three** of the following: 15
    (a) List and explain different types of Domain Name Servers.
    (b) Explain the working of POP3 and IMAP.
    (c) Explain any five directives of vsftpd.conf file.
    (d) Give example of zone file. Explain
    (e) List key components that are essential for email to work. Explain in short.
    (f) Write the advantages of vsftpd.

6. Attempt **any three** of the following: 15
    (a) Write the steps to configure mailman.
    (b) What is the purpose of MPM ? Explain different approaches to process creation and control.
    (c) Explain the directory block ofhttpd.conffile.
    (d) Write a SSI script that will display long listing of /root.
    (e) Explain the working of Apache web server.
    (f) Write a short note on content negotiation.

7. Attempt **any three** of the following: 15
    (a) List various commands used to manage the groups in Linux. Also write the purpose of each.
    (b) Explain how to optimize web service.
    (c) Explain with suitable example user creation using command.
    (d) Explain rpmquery command with options.
    (e) Explain with example how password of multiple users can be changed in a single operation.
    (f) What are the advantages of shadow password over traditional password system?