Paper / Subject Code: 82902 / Linux Server Adminstration

PROGRAM. CODE: 1SOO155

22|11|18

(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 5Marks)

(a) Multiple Choice Questions: (15)

i) Which of the following is commercial Distro?

   a) Fedora

   b) OpenSuSE

   c) Ubuntu

   d) RHEL

ii) _____ is an automatic updater and package installer/remover for RPM systems.

   a) apt-get

   b) yum

   c) dpkg

   d) dpms

iii) What is the last field in the below record of /etc/group file represents?

bin:x:1:root,bin,daemon

   a) groups belonging to group 'bin'.

   b) groups belonging to user 'bin'.

   c) users belonging to group 'bin'.

   d) Users created by user 'bin'.

iv) The _____ option tells showmount to show the NFS server's export list.

   a) -r

   b) -e

   c) -c

   d) -h

v) LDAP stands for _____

   a) Lightweight Dictionary Access Protocol

   b) Light Directory Access Protocol

   c) Lightweight Directory Access Protocol

   d) Light Dictionary Access Protocol

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(b) Fill in the blanks:
(4, Great Unified Booter, 1 , forward resolution, 2 , ssh, reverse resolution, dhcp, Grand Unified Bootloader)

i) _____ converts names into IP addresses.

ii) To set SetUID bit, we have to add value _____ before the access permission in chmod command

iii) GRUB stands for _____

iv) process ID of INIT process is _____

v) Configuration file for _____ is sshd_config.

(c) Short Answers:
i) Define RPM.
ii) Write the syntax of mount command.
iii) What is the use of runlevel 0?
iv) Define Active FTP.
v) What is SNAT?

Q. 2 Attempt the following (Any THREE)(Each of 5Marks)   (15)
(a) Explain the format of following files:
   i)   /etc/passwd
   ii)   /etc/shadow
(b) What is GNU public license? Explain advantages and disadvantages of open source software.
(c) List and explain network security tools.
(d) Diagrammatically explain the steps involved in creating a logical volume.
(e) Define the following terms:
   i)   Physical Volume
   ii)   Logical Volume
   iii)   Volume Group
   iv)   Physical Extents
   v)   Logical Extents
(f) Write a short note on cron program.

Q. 3 Attempt the following (Any THREE) (Each of 5Marks)   (15)
(a) Explain the following in regards with DNS:
   i)   Use of DNS
   ii)   Root domain
   iii)   Top-level domain
   iv)   Second-level domain
   v)   Third-level domain
(b) What is OpenSSH? List and explain any 3 OpenSSH programs.
(c) Define Apache. Explain its advantages.
(d) Write use of SMTP? List and explain the key components that are essential for email to work.
(e) Discuss FTP.

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(f) Write any 5 DNS record types.

Q. 4 Attempt the following (Any THREE) (Each of 5Marks)   (15)
(a) List and explain any 4 components of NFS.
(b) Define MySql. Explain in short InnoDB and MyISAM database engines.
(c) Discuss any 5 common dhcpd.conf options.
(d) Explain the following servers required for running chat applications.
   i)   IRC server
   ii)   Jabbar Instant Messaging server.
(e) Write steps to create Share in Samba.
(f) What is LAMP? Write the steps to install LAMP applications.

Q. 5 Attempt the following (Any THREE) (Each of 5Marks)   (15)
(a) What is ARP? Explain the steps of ARP.
(b) How user management helps to secure Linux server from security threats?
(c) Discuss the importance of NIS. Explain Daemons and processes associated with NIS.
(d) Write a short note on INIT process.
(e) What is NFS? Explain the versions of NFS.

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(T Y.CS sem-5)

(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)   Multiple Choice Questions

1. The_____ is a message-oriented transport layer protocol

a) Datagram Congestion Control   b) Data Congestion Control Protocol
   Protocol (DCCP)

c) Datagram Communication   d) Datagram Congestion
   Control Protocol   Communication Protocol

2. Installing software through apt-get which command is been used____

a) sudo apt-get install <package-   b) sudo apt-get update <package-
name>   name>

c) sudo apt-get <package-name>   d) apt-get install <package-name>

3. DTLS stands for_____

a) Data Transport Layer Security.   b) Datagram Transport Layer
                                            Security.

c) Datagram Transmission Layer   d) Data Transfer Layer Security.
Security.

4. The_____ command changes the user and/or group that own a file.

a) cat   b) r-w-x

c) touch   d) chown

5. An MPTCP *Connection* between endpoints is formed of one or more
MPTCP Sub flows

a) True   b) False

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(b)   Fill in the blanks
      {Full-duplex, 10, secure, M2M Gateway, UDP Protocol, 5, Internet protocols}

      1) The primary advantage of TLS is that, it provides a,_____ transparent
          channel.
      2) DASH7 provides multi-year battery life, range of up to ___ km.
      3) IPsec was designed as a generic security mechanism for_____.
      4) The_____ contains M2M Applications and M2M Service
          Capabilities.
      5) In _____ communication occurs from sender to receiver and
          receiver to sender at same time.

(c)   Explain in Brief
      1) What is FFD?
      2) Define topology?
      3) How Adhoc network is created?
      4) Define Protocol?
      5) How much secure IoT is ?

Q. 2   Attempt the following (Any THREE)   (15M)
(a)   Explain with block diagram the IOT Functional model.
(b)   What are different types of IOT reference models? Explain each one in brief.
(c)   How network domain helps in establishing connection between the nodes in an
       IoT application?
(d)   Explain the working of home automation system with device , network domain
       and service capabilities.
(e)   Discuss the following in brief
       • Sensors
       • Actuators
(f)   Explain with example Physical World vs. Virtual World

Q. 3   Attempt the following (Any THREE)   (15M)
(a)   How IEEE 802.15 is different from 802.11?
(b)   Write a short note on 3GPP.
(c)   Write a short note on 6LoWPAN with its functions and characteristics.
(d)   How CORPL differs from RPL? Discuss CORPL with an IOT application.
(e)   Discuss the job of Data link Layer.
(f)   Discuss the working of ZigBee and its topologies with devices.

TURN OVER

Q. 4   Attempt the following (Any THREE)
(a)   Discuss the working of Datagram Congestion Control Protocol. Also explain   (15 M)
       ECN with an example.
(b)   Discuss the important features of MPTCP.
(c)   Write a short note on multi streaming
(d)   How HTTP help us in our day to day life.
(e)   How publisher and subscriber works in MQTT protocol
(f)   Explain basic operations available in XMPP

Q. 5   Attempt the following (Any THREE)
(a)   Discuss different M2M technologies?   (15 M)
(b)   Write a short note on 6TiSCH.
(c)   What is a Service layer? Who accesses the service layer?
(d)   Discuss features of ETSI M2M high level architecture with diagram.
(e)   How BBF helps to overcome the challenges faced by different organisations?

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(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 5Marks) (15)
(a) 1. _____ is not a component of node structure
a) state b)Parent
c) child d) Action

2. _____ is also called as Heuristic search
a)Uninformed search b) informed search
c) Depth Limited Search d) uniform cost search

3. _____ agent does not maintain internal state.
a)Model based b) Goal -based
c) Simple reflex d) Utility-based

4. If a hypothesis agrees with all the data, it is called as………..
a) consistent hypothesis b) Integral hypothesis
c) best hypothesis d) Regular hypothesis

5. . The most widely used ensemble method is called _____
a) Bayesian Learning b) Online learning
c) Boosting d) Support Vector Machine.

(b) Fill in the blanks.
(Decision List, omniscient, Single, Regularization, Parameter Learning)

1. A decision tree returns a _____ output value.
2. _____ is finding the numerical parameters for a probability model whose structure is fixed.
3. This process of explicitly penalizing complex hypothesis is called_____.
4. _____ agent knows the actual outcome of its actions and can act accordingly.
5. _____ consists of series of tests, each of which is a conjunction of literals.

(c) Short Answers(Unit-I, II and III)
1. What is early stopping?
2. Define Error Rate.
3. How denote learning rate?
4. Define decision boundary.
5. What is triangle inequality?

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Q. 2   Attempt the following (Any THREE)(Each of 5Marks)   **(15)**
(a)   Describe Model-based agent.
(b)   What is PEAS? Mention it for Part picking robot and Medical Diagnosis system.
(c)   Explain Artificial Intelligence with Turing Test approach.
(d)   Describe problem formulation of vacuum world problem.
(e)   Explain these properties of task environment.
      1.   Deterministic vs. Stochastic
      2.   Fully observable vs. partially observable
(f)   List and explain the categories of definition of AI.

Q. 3   Attempt the following (Any THREE) (Each of 5Marks)   **(15)**
(a)   Explain the concept of Locality Sensitive Hashing.
(b)   Write a note on Artificial Neural Network.
(c)   Explain K-fold cross validation and LOOCV.
(d)   Write a note on Supervised Learning.
(e)   What is entropy? How do we calculate it?
(f)   Write a note on Nearest Neighbor model.

Q. 4   Attempt the following (Any THREE) (Each of 5Marks)   **(15)**
(a)   Explain the concept of Passive Reinforcement Learning.
(b)   Write a note on Statistical Learning.
(c)   Explain Hidden Markov Model.
(d)   Briefly explain the concept of direct utility estimation.
(e)   What are the applications of Reinforcement Learning?
(f)   Explain the concept of EM algorithm.

Q. 5   Attempt the following (Any THREE) (Each of 5Marks)   **(15)**
(a)   Explain Breadth First Search strategy along with its pseudocode.
(b)   Write a note on Decision Tree. Also describe its pruning technique.
(c)   Explain Naïve Bayes Model.
(d)   Explain the concept of Goal Based Agent.
(e)   Write a note on overfitting in decision tree.

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(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 5Marks)   (15M)
(a)   Multiple Choice Questions   (5M)
1.   Which of the following is not a part of a test design document?
   a) Test Plan   b) Test Design Specification
   c) Test Case Specification   d) Test Log
2.   According to Pareto's principle, x% of defects can be traced to y% of all causes. What are the values of x and y?
   a) 60, 40   b) 70, 30   c) 80, 20   d) No such principle exists
3.   Which of the following term describes testing?
   a) Finding broken code   b) A stage of all projects
   c) None of the mentioned   d) Evaluating deliverable to find error
4.   Boundary value analysis belongs to?
   a) Black Box Testing   b) White Box Testing
   c) White Box & Black Box Testing   d) None of the mentioned
5.   In DMAIC method of Six Sigma, C stands for?
   a) Connect   b) Correct   c) Control   d) Cover

(b)   Fill in the blanks   (5M)
(Verification, Minimum Time to Failure, Proof of Correctness, International Standard Organization, Validation, Run Chart, Mean Time to Failure, Proof of Identification, Indian Standard Organization, Scatter Chart)

1.   "Are we building the right product?" means_____.
2.   MTTF stands for_____.
3.   Formal Approaches to SQA involves_____.
4.   ISO means_____.
5.   _____ is a line graph of data plotted over time.

(c)   Short Answers- Define the following:-   (5M)
1.   Quality
2.   Software Testing
3.   Quality Assurance
4.   Defect Reporting
5.   Software Safety

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Q. 2   Attempt the following (Any THREE)(Each of 5Marks)   (15M)
(a)   Explain any five desirable software qualities.
(b)   Give the concept of Software reviews, Inspection and Walkthrough.
(c)   List Black Box Testing types. Explain any two.
(d)   Discuss levels of testing.
(e)   Distinguish between Verification and Validation.
(f)   Write a note on SDLC.

Q. 3   Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   Write a note on Unit Testing.
(b)   Explain categories of Software Metrics.
(c)   Discuss Defect Management Process in detail.
(d)   What are Smoke Testing and its benefits?
(e)   Give the concept of Complexity Metrics.
(f)   Explain Bottom-Up Integration testing.

Q. 4   Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   Discuss any five guidelines for formal technical review.
(b)   What are the advantages of ISO 9000 standards?
(c)   Write a note on SQA plan.
(d)   How to measure quality cost?
(e)   What are the elements of software reliability? State factors affecting it.
(f)   Write in brief about any three reliability metrics.

Q. 5   Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   Differentiate between White Box and Black box testing
(b)   How to use defects for process improvement?
(c)   What are activities under quality movement?
(d)   Explain Cyclomatic complexity with example.
(e)   Write in brief about test case design. Give example.

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(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 Question

i) Rail Fence Technique is an example of

a) Substitution

b) Transposition

c) Product cipher

d) Caesar cipher

ii) Which of the following is passive attack? a) Relay attack b) Masquerade c) Traffic analysis d) Denial of Service

iii) IPsec services are available in _____ Layer. a) Application b) Data link c) Network d) Transport

iv) To verify a digital signature we need the a) Sender's Private key b) Sender's Public key c) Receiver's Private key d) Receiver's Public key

v) A polymorphic virus undergoes a) Crossover b) Mutation c) Genetic processing d) None of these.

(b) **Fill in the blanks**

(MD5,2,4,steganography,cryptanalysis)

i) _____ attack rely on the nature of algorithm and general characteristics of plain text.

ii) _____ is a message digest algorithm.

iii) _____ is a technique for hiding a secret message within a larger one.

iv) Each AES round consists of ____ separate functions.

v) No. of keys used in Asymmetric key Cryptography is _____

(c) **Short Answers**

i) What is mono alphabetic substitution cipher?

ii) List out different types of components available in Fiestel cipher.

iii) List out any two advantages of AES over DES.

iv) What is worm?

v) What is MAC?

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

(a)   List and explain different categories of security services.

(b)   What is substitution cipher? Explain any one substitution technique in detail.

(c)   Write a short note on DES.

(d)   What are different modes of operation to apply a block cipher? Explain any one in detail.

(e)   Discuss asymmetric key cryptosystem. List out the differences between symmetric
       and asymmetric cryptography.

(f)   Explain Active Attacks and its type?

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

(a)   Explain Diffie-Hellman key exchange algorithm.

(b)   Write a short note on HMAC.

(c)   What is hash function? Discuss its characteristics.

(d)   What is digital signature? List out its desired properties.

(e)   Discuss Kerberos in detail.

(f)   Write a short note on X509 standard.

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

(a)   Write a short note on PGP.

(b)   What is SSL? Discuss its architecture.

(c)   Define intruder. Explain different types of intruders.

(d)   Discuss different approaches of intrusion detection.

(e)   What is firewall? Explain its limitations.

(f)   What is virus? Explain its counter measures.

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

(a)   Discuss how public key cryptography compliments private key cryptography rather being
       a replacement of it.

(b)   Discuss Man in middle attack.

(c)   Write short note on i)Trapdoor   ii)Logic bomb

(d)   Explain additive cipher with proper example.

(e)   Explain two general approaches of attacking a cipher.

(Time: 2$^{1/2}$ Hours)   (Total Marks:75)

N.B   1) All questions are compulsory
        2) Figures to the right indicate marks
        3) Mixup of questions not allowed

Q1a   Choose the correct answer from the given options: 5

1   The relation between vertices, faces and edges of a 3D Polygon object is given as
        a)   Vertices= faces – edges +2   b)   Vertices= faces + edges+2
        c)   Vertices= faces – edges --2   d)   Vertices=faces+ edges --2

2   The basic building block in 3D object model is
        a) Rectangle   b) triangle   c) polygon   d) cube

3   Which one of the following is not a valid geometric transformation
        a) Scaling   b) Revolution   c)   Rotation   d) Reflection

4   The API used in Unity 3D is
        a) OpenGL   b) Direct3D   c) OpenGL ES   d) Proprietary API

5   The process of computing pixel color from projected 3D triangle is known as
        a) Blending   b) Shading   c)Rasterization   d) positioning

Q1b   Answer in one or two sentences: 5

1   Mention the four co-ordinate systems used in graphics pipeline
2   What is the relation between a Quarternion and its inverse
3   State the Pythagoras theorem for 3D
4   Mention the use of interpolant in computer graphics
5   Define the Term Virtual Reality and give its application

Q1c   Fill in the blanks taking answer from the pool of values: 5

[Controller, Swapping, Double,Presenting, Animation, Stencil, Tessellation, Translation,
Rigidbody]

1   Interchanging the roles of back buffer and front buffer is called -----------

2   A 8 bit ------------------- Buffer is always attached to depth buffer
3   Subdividing the triangles of a mesh to add new triangles is called ----------------
4   ------------- allow game objects to act under the control of Physics Engine.
5   Manipulating images and objects in dynamic medium as moving images is called----------------

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Q2   **Answer any Three from the following:**   15

1   Define Lambert's law and explain its use in lighting calculation
2   Explain in detail the stages in the rendering pipeline
3   Describe any two 2D transformation in detail
4   Bring out the advantages of GPU architecture
5   Differentiate between super sampling and multisampling techniques
6   Write a short note on Direct 3D Feature levels

Q3   **Answer any Three from the following :**   15

1   What are B-Splines .State its types and advantages
2   Describe the steps in perspective projection
3   Explain the procedure of interpolating two Vectors
4   Obtain the Hessian Normal form for a straight line
5   Describe the intersection points of two straight lines
6   Write a short note on Quarternions

Q4   **Answer any Three from the following :**   15

1   Explain the use of assest and assest store in unity 3D
2   Define HMD and explain any two such devices
3   What is meant by specular lighting
4   Explain the term MR and state its applications
5   Describe how a material is associated with a game object in Unity 3D.
6   Explain the following functions with example Update() and FixedUpdate().

Q5   **Answer any Three from the following:**   15

1   Describe how parallelism is achieved in GPU Architecture
2   Explain the depth buffering technique applied on Graphic objects
3   Write a short note on Linear Interpolation
4   Explain the AddForce method used with Scripting in Unity
5   Define Components and explain how they are used with game objects

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(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 5Marks)   (15M)

(a)   Multiple Choice Questions   (5M)

     1. In contrast, the contract-first approach encourages you to think of the service contract first in terms of :-
        a) XML   b) XML Schema(.xsd)
        c) WSDL   d) All of the mentioned

     2. The basic Web Services platform is combination of _____ and _____
        a) CSS + HTTP   b) XML + HTML
        c) XML + HTTP   d) CSS + JAVA

     3. Which of the following is correct about Service Description layer in Web Service Protocol Stack?
        a) This layer is responsible for describing the public interface to a specific web service
        b) Currently, service description is handled via the Web Service Description Language (WSDL)
        c) Both of the above
        d) None of the above

     4. Which of the following style(s) is/are Strictly WS-I compliant?
        a) Document/encoded   b) RPC/literal
        c) Document/literal   d) RPC/encoded

     5. XML digital signatures provides
        a) Authentication   b) Authorization
        c) Confidentiality   d) Integrity

(b)   Fill in the blanks   (5M)
     (Use these pool of options – JAXR, ServiceContract, UDDI, One, Web Services)
     1. _____ is used to convert your application into Web-Application.
     2. Web services can be discovered using _____
     3. The standard for deploying web services on the Java EE platform as of Java EE 1.4 is _____.
     4. _____ attribute is used to define a wcf service class.
     5. The default WCF Request Send/Receive timeout is _____ min(s).

(c)   Give short answers in 1-2 sentences   (5M)
     1. What is the purpose of SOAP in a web service?
     2. List key elements of a RESTful implementation
     3. Purpose of URI in RESTful web services?
     4. Explain the rest state and motion of body.
     5. Which WCF Contract used to document error from service to client?

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Q. 2 Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   Explain in brief the various tags in WSDL document.
(b)   Explain in detail the data structures used in UDDI.
(c)   What is JAX-WS? How it is useful for describing SOAP web services?
(d)   How web services are related to distributed computing?
(e)   What is the Enterprise Service Bus and how does it relate to SOA?
(f)   List the advantages and disadvantages of SOAP.

Q. 3 Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   List and explain the various Http methods required for creating
      RESTful Web Services.
(b)   List and explain the important points to be considered when constructing a
      standard URI.
(c)   Describe the core constraint of RESTful system.
(d)   Explain how data exchange happens using JSON.
(e)   Explain OAuth 2.0 with an example?
(f)   Explain annotations for processing HTTP request methods?

Q. 4 Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   What is Windows Communication Foundation (WCF)?
(b)   Giving example explain how to define a Windows Communication Foundation
      Service Contract.
(c)   Define quality of service for Web services.
(d)   With neat figure illustrate the major layers of the Windows Communication
      Foundation (WCF) architecture.
(e)   Explain different tasks that are required to build a WCF application
(f)   Explain the Features of WCF in detail?

Q. 5 Attempt the following (Any THREE) (Each of 5Marks)   (15M)
(a)   Write a short note on WSDL message exchange patterns.
(b)   Explain annotations used in RESTful web service.
(c)   How a .Net application can communicate with a Java application?
(d)   List and explain various applications of Web services.
(e)   List the advantages and disadvantages of Statelessness.

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