**(2½ Hours)**

**[Total Marks: 75]**

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 three* of the following:** **15**

a. What are the different Linux distributions? Explain any five in brief.
b. What are different shells available in RHEL 6.x? Explain the following commands: cat, tac, tail and head.
c. How are the jobs scheduled and started automatically in RHEL 6.x? Explain.
d. State and explain the duties of the Linux system administrator.
e. Explain the following terms for installing and managing software:
tarball, redhat package manager, software dependency, RHN, querying with rpm.
f. How is software installed using yum? Explain yum in detail.

**2. Attempt *any three* of the following:** **15**

a. What is Logical Volume Manager? What are the different types of partitions that are created in Linux?
b. State and explain the different types of file systems.
c. What is SSH? How is ssh server enabled? Explain.
d. How is the network troubleshooting done on RHEL 6.x? Explain the different things that are checked while troubleshooting.
e. Explain useradd, usermod, userdel commands. Explain the following options of passwd command: –l , –u, –S, –e, –n min, –c warn, –i intact.
f. What are Pluggable Authentication Modules? What are its two parts? Explain.

**3. Attempt *any three* of the following:** **15**

a. What is IP masquerading? How is it enabled? How is port forwarding used in combination with IP masquerading?
b. What is iptables, tables, chains, rules? How is rule composed? Explain.
c. How is self signed certificate created with openssl?
d. What is GPG? How is it used to create and transfer keys? How are files encrypted with GPG?
e. What is NFS? What are the improvements in NFS4 over its previous versions? How is NFS4 setup? Explain.
f. What is Samba Server? How is it setup? Explain.

**4. Attempt *any three* of the following:** **15**

a. What are the different types of DNS servers? With the help of an example, explain the DNS lookup process.
b. What is DHCP? How is DHCP server setup?
c. Explain: Message Transfer Agent, Mail Delivery Agent, Mail User Agent with examples.
d. How is postfix setup as SMTP server? How is mail server opened for external mail?
e. Explain the httpd.conf file in detail.
f. How is SELinux configured for Apache? Explain.

**[*Turn over…***



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**5. Attempt *any three* of the following:** **15**

a. What is a shell script? What are the elements of a good shell script? How is a script executed?
b. What is pattern matching? Write a shell script that isolates the directory name from a complete file name.
c. What is high availability? State and explain the requirements of high availability.
d. What is GFS2? Explain. How is it created?
e. How is network server configured as an installation server? Enumerate the steps for the same.
f. How are TFTP Server configured for PXE boot? Explain.

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**(2½ Hours)**

**[Total Marks: 75]**

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(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 three* of the following:** **15**

a. What is .NET framework? Explain in detail .NET framework along with a neat diagram.
b. What is garbage collection? How does it work in .NET?
c. Explain compiling and execution of a C# program.
d. What is difference between value type and reference type in C#?
e. Explain inheritance along with its types.
f. What is an ArrayList? State its methods and properties.

**2. Attempt *any three* of the following:** **15**

a. Write a short note on ASP.NET page life cycle.
b. List and explain various types of files which are used in an ASP.NET application.
c. Write a short note on AdRotator control.
d. Explain Calendar control with example.
e. What is meant by validation of data? How to use ASP.NET validation control to validate the user input?
f. Explain any two Site Navigation Controls in ASP.NET.

**3. Attempt *any three* of the following:** **15**

a. Explain Page Tracing in ASP.NET with an example.
b. Write a short note on Query Strings state management technique.
c. Develop ASP.Net web application to count total number of visitors visited to an ASP.NET website.
d. What is CSS? List and explain types of CSS.
e. What is a mater page? Explain the advantages of using master page.
f. What are themes? Explain procedure of creating and using themes in a website.

**4. Attempt *any three* of the following:** **15**

a Draw and explain ADO.NET data provider model with diagram.
b Explain (i) ExecuteNonQuery (ii) ExecuteScalar (iii) ExecuteReader
c Write a short note on Data Binding.
d Explain SqlDataSource control.
e What is difference between DeatilsView and FormView control?
f Compare: Data Adapter and Data Reader.

**5. Attempt *any three* of the following:** **15**

a. Explain the working of AJAX.
b. What is XML? List the various XML classes.
c. What do you mean by authentication and Authorization? Explain its types.
d. Explain ScriptManager and Timer controls.
e. Explain AutoCompleteExtender in ASP.NET AJAX Control Toolkit.
f. How web.config file is used to implement forms authentication in ASP.NET?

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**10158**



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**(2½ Hours)**

**[Total Marks: 75]**

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(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 three* of the following:** **15**

a. Define Internet of Things and explain its components.
b. List and explain the roles of people making Internet of Things.
c. Explain calm and ambient technology using example of Live Wire.
d. Explain the following concepts with respect to IoT :
(i) Small pieces loosely joined (ii) Graceful degradation
e. Differentiate between static and dynamic IP address
f. Explain the working of Domain Name System (DNS).

**2. Attempt *any three* of the following:** **15**

a. Discuss open source versus closed source hardware and software. State their advantages and disadvantages.
b. What is the role of sketching in prototyping? Explain.
c. How can we tap into the community for promoting IoT devices? Explain.
d. Explain the following with respect to prototyping embedded devices: Processor Speed, Networking, Power Consumption and Physical Size and Form Factor.
e. Explain microcontrollers and system-on-chips with respect to embedded computing.
f. How is development done on the Raspberry Pi? Explain.

**3. Attempt *any three* of the following:** **15**

a. Explain the non-digital methods of prototyping.
b. Explain any three methods of 3D printing.
c. Compare Laser Cutting with CNC Milling.
d. Explain the following terms with respect to APIs: (a) Scraping, (b) Mashing up APIs.
e. Explain the various standards for implementing an API.
f. Explain the following protocols suited to Internet of Things applications : Message Queuing telemetry transport (MQTT), Extensible Messaging & Presence Protocol(XMPP), Constrained Application Protocol (CoAP)

**4. Attempt *any three* of the following:** **15**

a Explain different types of memory.
b What are the concerns regarding performance and battery life while writing code for embedded systems?
c What are the libraries available for embedded systems? Explain.
d Write a note on Long tail of the Internet.
e Explain the following business models: Make Thing Sell Thing, Subscriptions, Customization.
f What are the various options available for funding an Internet of Things startup? Explain any two.

**[*Turn over…***

**10156**



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**5. Attempt *any three* of the following:** **15**

a. Explain common PCB (Printed Circuit Board) making techniques.
b. Explain the need of Certification in IoT devices.
c. Explain the concept of privacy with respect to Internet of Things.
d. Discuss the five critical requirements for sensor commons project.
e. Discuss the main goals of Open Internet of Things definition.
f. Explain the environmental concerns about the production and running of the Thing itself.

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