(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. Elaborate the duty of linux system administrator in backing up and restoring files.
b. Discuss the two prominent features of bash. Explain the commonly used bash key sequences.
c. Explain the interface of the top command.
d. List the steps to mount a USB flash drive.
e. What is meant by rotating a log file? A logrotate file /etc/logrotate.d/auth contains the following. Explain the meaning of the three parameters used in the file.
/var/log/auth
weekly
rotate 2
compress
f. Give an overview of the common yum commands.

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

a. List the steps to automatically mount a file system using fstab.
b. Discuss the steps to resize logical volumes.
c. Briefly explain the various commands to configure networking from the command line.
d. State the different SSH security settings used while securing a SSH server.
e. Elaborate the following commands:
i. useradd
ii. usermod
iii. groupadd
iv. userdel
v. passwd
f. What are Access Control Lists? Explain the commands to change and view ACL settings.

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

a. Build a Netfilter firewall that allows HTTP packets.
b. Discuss the chains available for a NAT table of a firewall.
c. Explain the purpose of the four subdirectories: certs, newcerts, private, and crl
d. List the steps to create and exchange GPG keys.
e. Discuss the two ways in which NFS shares can be mounted automatically.
f. What is Samba? Briefly explain the Samba Advanced Authentication Options.

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

a Explain the DNS Lookup process.

b Write the meaning of the following statements from the dhcpd.conf file:

```
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;
default-lease-time 600;
max-lease-time 7200;
subnet 10.254.239.0 netmask 255.255.255.224 {
range 10.254.239.10 10.254.239.20;
option routers rtr-239-0-1.example.org, rtr-239-0-2.example.org;
}
```

c List the steps to open Mail Server for External Mail.

d Explain the Base Dovecot Configuration.

e Explain the following parameters in the configuration file of Apache:

i. Listen
ii. DocumentRoot
iii. User
iv. Group
v. ServerRoot

f Explain the steps to configure Apache for LDAP authentication.

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

a. Write a shell script to add a user and create an empty file. Set the permissions of the file to 744. Accept username as command line argument, accept file name as user input.

b. Write a shell script to display all lines from a text file. Use for loop.

c. Explain the steps to set up a bonded network interface.

d. Discuss the steps to create a GFS File System.

e. Explain how a kickstart file can be used to perform an automated installation.

f. List the steps to configure the Network Installation Server.

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(2½ Hours) **[Total Marks: 75]**

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

a. Explain .NET framework's architecture in brief.
b. Explain for each loop with suitable example.
c. Write a C# program to demonstrate the use of Multicast delegates.
d. Compare: value types and reference types in C#.
e. Give details about type conversion.
f. What is String class in C#? Write any 3 properties and methods.

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

a. Write a short note on ASP.NET page life cycle.
b. Write a short note on page class.
c. Explain any five properties of List Box and Drop Down List controls.
d. Explain AdRotator control in ASP.NET.
e. What is meant by validation of data? How to use the ASP.NET validation control to validate the user input?
f. Explain any two website navigation controls in ASP.NET.

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

a. Explain exception handling mechanism in C# with example.
b. Define session state management. What are the modes of storing session state data?
c. Elaborate cookie with suitable code snippet.
d. What is cross-page posting? Explain with an example.
e. Explain Master Page with its uses and working.
f. What is Theme? Explain Global theme.

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

a Explain ADO.NET architecture.
b What is DataReader? Give suitable example.
c Write short note on Data Source Controls.
d What is data binding? Explain its types.
e What are the attributes of GridView control?
f Compare: Data Adapter and Data Reader.

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

a. Explain the working of AJAX.
b. Write short note on the XML Text Reader class.
c. What do you mean by authentication and authorization? What are its types?
d. Explain ScriptManager and Timer controls.
e. Explain AJAX with its advantages and Disadvantages.
f. How to configure web.config for implementing Forms authentication?

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(2½ Hours) **[Total Marks: 75]**

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

a. Define and explain the Internet of Things with 2 examples.
b. Explain calm and ambient technology using example of Live wire.
c. What is manufactured normalcy field? Explain.
d. Discuss the issue of Privacy in Internet of Things.
e. What is TCP and UDP ports? Explain with examples.
f. Define protocol. Explain the following application layer protocols: HTTP, HTTPS, SMTP, FTP,POP3, IMAP.

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

a. Explain microcontrollers and system-on-chips with respect to embedded computing.
b. Describe the difficulties encountered during the transition from a prototype to mass production?
c. How can one tap into the community for promoting IOT devices? Explain.
d. Describe Beagle bone Black with a focus on the following aspects: Operating System, Programming Language, Debugging, Hardware and Openness.
e. Compare python characteristics with C++.
f. Write a short note on Electric Imp.

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

a. Explain the sketch, iterate and explore process in prototyping.
b. What are laser cutters? Explain the main features to consider while choosing a laser cutter.
c. What is CNC Milling? Explain.
d. Explain the following terms with respect to APIs: (a) Scraping, (b) Mashing up APIs.
e. What is comet? Explain.
f. Explain the following protocols suited to Internet of Things applications: Message Queying telemetry transport (MQTT), Extensible Messaging & Presence Protocol(XMPP), Constrained Application Protocol

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

a What are the concerns regarding performance and battery life while writing code for embedded systems?
b Write a short note on long tail of Internet.
c Explain different types of libraries for embedded systems which works with limited memory.
d Discuss the business model canvas for Internet of Things.

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e Explain the following business models:
   i. Provide infrastructure
   ii. Take a percentage
   iii. Be a Key Resource

f What is venture capital? How can one exit?

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

a. Explain the steps for manufacturing PCBs.
b. Discuss different environmental issues in Internet of Things.
c. Write a short note on mass-producing the case and other fixtures.
d. Explain in detail the process of designing kits.
e. Discuss the issues in scaling up the software for large scale IOT devices.
f. Explain the five critical requirements for sensor commons project.

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(2½ Hours)

[Total Marks: 75]

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

a. Software Projects are difficult to manage when compared to other projects. Justify this statement with suitable reasons.

b. What do you mean by W5HH principle? Explain briefly the different phases in Project Management Life Cycle.

c. Define the following terms:
i) Net Profit ii) Return on Investment iii) Payback Period iv) Net Present Value
v) Internal rate of Return

d.

Year	Cash Flow
0	-5,00,000
1	1,00,000
2	50,000
3	25,000
4	3,00,000
5	6,00,000

Calculate ROI (Return on Investment) and Pay Back period for above.

e. List the activities involved in identifying project scope and objectives.

f. Give an overview of the main steps involved in project planning.

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

a. List the advantages and disadvantages of using Prototyping approach in Software Development.

b. Discuss the advantages and disadvantages of Off-the-shelf Software.

c. List and explain briefly ATERN principles.

d. Write short note on Albrecht Function Point.

e. Explain Top down and Bottom up approach for effort estimation.

f. What are Caper Jones estimating Rules of Thumb?

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

a. Draw precedence activity network using following details:

Activity	Predecessor	Duration
A	--	5
B	A	4
C	A	5
D	B	6
E	C	3
F	D,E	4

Calculate the float for each of the paths formed in the above precedence diagram.
Identify the critical path.
Calculate the earliest finish time for the project.

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b. Explain briefly the objectives of activity planning.
c. List and explain briefly the various activities involved in Risk Management.
d. Explain Boehm's top ten Software project Risks.
e. List the different categories of resources. Explain Burman's Priority List.
f. Which factors should be taken into consideration for allocation of individuals to tasks?

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

a What are the different roles in the Review process? Explain briefly.
b Explain Slip Chart with the help of a diagram. What can one interpret from the slip chart?
c Write short note on Time and Materials contracts mentioning its advantages and disadvantages.
d Explain the different stages in contract placement.
e What is Vroom's expectancy theory of motivation? Explain.
f Give an overview of the general selection process of developers in a Software firm.

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

a. List and explain briefly the various management roles required to form a balanced team, according to Meredith Belbin.
b. What is Delphi approach? Explain.
c. Explain the different levels in Software Testing. What do you mean by Verification and Validation?
d. What are different CMM maturity levels? Explain with the help of a neat diagram.
e. Discuss the steps involved in Project Closure Process.
f. What are the different types of Project closure? Explain the reasons owing to which projects are prematurely closed.

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