

Roll No.

Total Pages : 3

43167

BT-3/D-24

ELECTRONICS FUNDAMENTALS

Paper-ES-201A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt any *five* questions, selecting at least *one* question from each unit.

UNIT-I

1. (a) Discuss the forward bias, reverse bias and no bias condition of a P-N junction diode. Draw V-I characteristics for each.
- (b) A germanium diode has reverse saturation current of $0.19 \mu\text{A}$. Find the current in the diode when it is forward biased with 0.3 V at 27°C . (15)
2. (a) The applied input a.c. power to a half-wave rectifier is 100 watts. The d.c. output power obtained is 40 watts.
 - (i) What is the rectification efficiency?
 - (ii) What happens to remaining 60 watts?
- (b) Discuss the working principle, construction and applications of LED. (15)

UNIT-II

3. (a) Discuss the operation of a transistor in PNP mode.
(b) A common base transistor amplifier has an input resistance of 20Ω and output resistance of $100 \text{ k}\Omega$. The collector load is $1 \text{ k}\Omega$. If a signal of 500 mV is applied between emitter and base, find the voltage amplification. Assume α_{ac} to be nearly one. (15)
4. (a) What is biasing? Discuss in detail the base resistor method of biasing.
(b) What is transistor load line? Discuss DC load line in detail. (15)

UNIT-III

5. (a) What is Barkhausen criterion of oscillations? Derive its equation.
(b) A Wien Bridge Oscillator circuit is required to generate a sinusoidal waveform of $3,200 \text{ Hertz}$ (3.2 kHz). Calculate the frequency and determine the resistors R_1 and R_2 and the capacitors C_1 and C_2 . Given $f_r = 3.2 \text{ kHz}$. (15)
6. Write short notes on the following :
- (a) Crystal oscillator.
(b) The tuned collector oscillator circuit used in the local oscillator of a radio receiver makes use of an LC tuned circuit with $L_1 = 58.6 \mu\text{H}$ and $C_1 = 300 \text{ pF}$. Calculate the frequency of oscillations. (15)

UNIT-IV

7. (a) Discuss the terms :
Sensitivity, Resolution, Repeatability and Drift in context to electronic measurement system.
- (b) What is an error? Discuss the various types of errors encountered in an electronic measurement system. (15)
8. (a) What is a transducer? Discuss the characteristics and selection criterion for transducer measurement.
- (b) A LVDT produces an output RMS voltage of 2.6 V for displacement of 0.4 μm . Calculate the sensitivity of LVDT. (15)
-

Roll No.

Total Pages : 2

43168

BT-3/D-24

DIGITAL ELECTRONICS AND LOGIC DESIGN

Paper-ES-217A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each Unit.

UNIT-I

1. (a) Convert following binary number in Decimel and Hexadecimal numbers :
(i) 110.1010 (ii) 10101. (5)
(b) Perform following operations using 1's compliment :
(i) 36 - 23 (ii) 23 - (-15). (5)
(c) Explain the conversion of OR operation into AND operation with the help of demorgan theorem. (5)

2. (a) Draw the logic diagram of 4 bit binary to grey code convertor. Explain the conversion method of binary code to grey code with help of an example. (7)
(b) Minimize the expression using K-Map :
$$F = \Sigma(1, 2, 5, 6, 8, 9, 10) + d(3, 7, 15).$$

Also realize the obtained expression using AOI logic. (8)

43168/250/KD/1009

417 [P.T.O.
31/12

UNIT-II

3. (a) State and explain the working of BCD adder with its logic diagram? (10)
(b) Design an octal to binary encoder. (5)
4. (a) What do you mean by multiplexer? Explain the working of $n : 1$ mux. Implement the given expression using $8 : 1$ MUX $F(A, B, C, D) = \Sigma(0, 1, 2, 4, 9, 10, 12, 15)$. (10)
(b) Design a 3 bit odd parity generator. (5)

UNIT-III

5. (a) Explain the working of SR flip-flop. Explain the problem associated with SR flip-flop. (8)
(b) Convert D flip-flop in T flip-flop. (7)
6. (a) Design an asynchronous decade counter. Use J-K flip-flop for designing the counter. (8)
(b) What do you mean by register? Draw and explain the logic diagram of serial in serial out shift right register. (7)

UNIT-IV

7. Explain about specifications of Digital to Analog convertors. Explain working of weighted resistor Digital to Analog Converter. (15)
8. (a) Describe working of Flash type ADC. (8)
(b) What is PAL? How is it different from PLA? (7)

Roll No.

Total Pages : 2

43169

BT-3/D-24

DATA STRUCTURE

Paper-PC-IT-205A

Time : Three Hours]

[Maximum Marks : 75

Note : There are total *Eight* questions. The candidates is required to attempt *five* questions selecting at least *one* from each. unit. All questions are carry equal marks.

UNIT-I

1. What are different user defined and build in data types in data structure. Also explain sparse metrics and write a program to implement transpose of data in metrics. (15)
2. Write an algorithm of merge sort and insertion sort. Explain both the algo with the help of an example. (15)

UNIT-II

3. What are polish notation of Stack in data structure. Write an algorithm to convert infix to postfix expression with the help of an example. (15)
4. What is difference between circular Queue and priority Queue. Write an algorithm to insert, delete and display from circular queue with the help of an example. (15)

43169/200/KD/1114

432 [P.T.O.
6/1

UNIT-III

5. What is need of Dynamic data structure. Also write an algorithm to display and delete data in simple linked list and explain it with the help of an example. (15)
6. Write an algorithm to insert and delete data in double linked list and explain it with the help of an example. (15)

UNIT-IV

7. What do you mean by binary tree. Write an program to implement binary tree with the help of an example using array and linked list. (15)
8. What is difference between tree and graph and its notations. Write Warshall algorithm and explain it with the help of an example. (15)

Roll No.

Total Pages : 2

43170

BT-3/D-24

OBJECT ORIENTED PROGRAMMING USING C++

Paper-PC-IT-207A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt all questions.

UNIT-I

1. (a) What is difference between class and object in Object Oriented Programming language. Explain with the help of an example. (5)
(b) What do you mean by access modifier in Object Oriented Programming language. Explain with the help of an example. (10)
2. (a) What is difference between methods and constructor OOPs. Explain with the help of an example. (5)
(b) What is proxy class, Friend class and Friend function. Explain with the help of an example. (10)

UNIT-II

3. What do you mean by overloading? Write a program to << and >> operator overloading. Explain it. (15)

43170/200/KD/1152

42 [P.T.O.
9/1

4. What is inheritance? Explain multilevel, multiple and hybrid inheritance with the help of an example. (15)

UNIT-III

5. What do you mean by abstract class and abstract methods. Write a program to find area of cube in C++ language using abstraction. (15)
6. What are different mode to open a file? Write a program to append data into a file until "STOP" word is entered. (15)

UNIT-IV

7. What do you mean by template? Explain function template and class template with the help of an example. (15)
8. What is exception handling? Write a program to handle exception (15)
- (a) divide by zero.
 - (b) array out of bound exception.
 - (c) file does not exist.

BT-3/D-24

43142

MATHEMATICS-III

Paper : BS-205A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt any *five* questions.

1. (a) Discuss the convergence of the series

$$\sum_{n=1}^{\infty} \left(\frac{n!}{(n^n)^2} \right).$$

- (b) Discuss the convergence or divergence of the series

$$\frac{x}{1.2} + \frac{x^2}{2.3} + \frac{x^3}{3.4} + \dots \quad x > 0.$$

2. (a) Obtain the Fourier series for
- $f(x) = e^{-x}$
- in the interval
- $0 < x < 2\pi$
- .

- (b) Obtain the Fourier expansion of
- $x \sin x$
- as a cosine series in the interval
- $(0, \pi)$
- and deduce that

$$\frac{1}{1.3} - \frac{1}{3.5} + \frac{1}{5.7} - \dots = \frac{\pi - 2}{4}.$$

3. (a) Solve
- $\frac{dy}{dx} = \frac{x^3 + y^3}{xy^2}$
- using exact differential equation.

- (b) Solve the differential equation

$$\left(\frac{dy}{dx} \right)^2 - 5 \frac{dy}{dx} + 6 = 0.$$

4. (a) Solve $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^{3x}$.

(b) Solve by the method of variation of parameters :

$$\frac{d^2y}{dx^2} + y = \operatorname{cosec} x.$$

5. (a) Change the order of integration in the interval :

$$\int_0^1 \int_{x^2}^{2-x} xy \, dx \, dy.$$

(b) Show that area between the parabolas $y^2 = 4ax$ and

$$x^2 = 4ay \text{ is } \frac{16}{3}a^2.$$

6. (a) Evaluate

$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz \, dx \, dy \, dz.$$

(b) Calculate by double integration, the volume generated by the revolution of the cardioid $r = a(1 - \cos \theta)$.

7. (a) If $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$, show that $\operatorname{grad} \frac{1}{r} = \frac{-\vec{r}}{r^3}$.

(b) Find the directional derivative of $\phi = x^2yz + 4xz^2$ at the point $(1, -2, -1)$ in the direction of the vector

$$2\hat{i} - \hat{j} - 2\hat{k}.$$

8. (a) Evaluate the line integral

$$\int_C (x^2 + xy)dx + (x^2 + y^2)dy,$$

where C is the square formed by the lines $x = \pm 1$,
 $y = \pm 1$.

- (b) Using Green's Theorem, evaluate

$$\int_C (y - \sin x)dx + \cos x dy,$$

where C is the plane triangle enclosed by the lines

$$y = 0, x = \frac{\pi}{2} \text{ and } y = \frac{2}{\pi}x.$$

Roll No. Total Pages : 2

43172

BT-3/D-24

FUNDAMENTALS OF MANAGEMENT

Paper-HM-905A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *five* questions in all, selecting minimum *one* question from each unit. Fifth question can be attempted from any unit. All questions carry equal marks, i.e. 15.

UNIT-I

1. Describe clearly the meaning and components of Business Environment. How does technological and socio-cultural environment affect business decisions?
2. Define the term management? What are functions of a manager working in large scale manufacturing firm? Also explain briefly Henry Fayol's principles of management.

UNIT-II

3. Explain/Answer the following questions in up to 200 words each :
 - (a) Meaning and scope of financial management.
 - (b) Any *two* tools of financial planning.
 - (c) Meaning and need of Working capital.
 - (d) Factors determining requirement of working capital.

43172/200/KD/1279

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17/1

4. What do you mean by the term 'capital structure'? Describe factors affecting choice of capital structure. Also explain sources of short-term finance.

UNIT-III

5. What do you mean by personnel management? Explain Managerial as well as operative functions of human resource manager.
6. Differentiate the following by giving examples :
- Job description and job specification.
 - Job analysis and job design.
 - HRD and HRM.

UNIT-IV

7. Explain the following :
- Meaning and various stages of Production Planning and Control.
 - Meaning and various steps involved in work measurement.
8. "The 7 Ps of marketing give the marketer a framework to use in his/her markets planning and essential strategy to effectively promote the target market". Comment on this statement by elaborating concept, need and essential elements of marketing mix.

IT. 5th / 6th

Roll No.

Total Pages : 04

BT-5/D-24

45198

JAVA PROGRAMMING

ES-301A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

Unit I

- 1. (a) Discuss the importance and benefit of object-oriented programming in Java. Write the step by step procedure to convert Java source code to bytecode. 8
- (b) How to initialize an object by reference variable in Java ? Discuss the usage and benefits of reference variable. 7
- 2. (a) Differentiate between String and StringBuffer in Java. Write a Java program using StringBuffer to concatenate strings. 8

- (b) Write a Java program to create a class called Shape with a method called getArea(). Create a subclass called Rectangle that overrides the getArea() method to calculate the area of a rectangle. 7

Unit II

3. (a) Define Packages. How do you add classes from a package ? Discuss the uses of java.io and java.util (collection framework) packages. 8
- (b) Distinguish between an exception and error. Explore different exception handling mechanisms with a Java program. 7
4. (a) What are thread priority ? Explain the properties of Daemon thread in Java. How deadlock plays an important role in multithreading ? 8
- (b) Differentiate between character stream and byte stream in Java. Write a Java program to read a file line by line and store it in a variable. 7

Unit III

5. Explain applet life-cycle methods. Explain the order of method invocation in an Applet. How do we pass parameters to an applet from HTML page to an Applet ?

15

6. (a) What are JDBC API components ? Discuss the steps to connect to the database in Java. 8
- (b) What are AWT classes ? Write a Java program to add a JMenuBar and JButton inside the JFrame. 7

Unit IV

7. (a) What are foreground and background events ? Explore the relationship between an eventlistener interface and an event-adapter class ? 8
- (b) What is the difference between GenericServlet and HttpServlet ? Explain the life-cycle methods for a servlet. 7

8. Write notes on the following :

3×5=15

- (a) Servlet Chaining
- (b) Init and Destroy
- (c) Synchronization.

Roll No.

Total Pages : 02

BT-5/D-24

45199

INTERNET AND WEB TECHNOLOGY

PC-IT-301A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (i) Explain the header diagram of IPv4. Discuss its various classes. 8
- (ii) Write a short note on Telnet. 7
2. Explain the layer architecture of TCP/IP architecture in detail. Differentiate OSI and TCP/IP. 15

Unit II

3. (i) Differentiate SMTP and IMAP. 8
- (ii) Discuss the role of various components involved in electronic mail with example. 7
4. (i) Define MIME. Explain different types of MIME. 7
- (ii) Discuss the working of search engines. 8

Unit III

5. (i) Discuss the use of various control statements used in Java Script with example. 8
- (ii) Write HTML code for table consisting of 3 rows and 3 columns. 7
6. (i) Explain different types of style sheets used in CSS with example. 7
- (ii) Write syntax for CSS padding, element selector, border and lists. 8

Unit IV

7. (i) Discuss different types of attacks in networks. 7
- (ii) Define cryptography. What are different types of cryptography used for encryption ? 8
8. Write short notes on the following : $2 \times 7.5 = 15$
- (i) Firewall
- (ii) Digital Signature.

Roll No.

Total Pages : 03

BT-5/D-24

45200

COMPUTER GRAPHICS

PC-IT-303A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss the various types of coordinate systems used in computer graphics using suitable examples. 7.5
- (b) Write and explain the boundary-filled algorithm using suitable examples. 7.5

2. (a) Write and explain the mid-point circle drawing algorithm using suitable examples. 7.5
- (b) Discuss in detail the working of : 7.5
 - (i) Light Pen
 - (ii) Digitizer
 - (iii) Tablet

Unit II

3. What are the various types of transformations ? Explain the following w.r.t. transformations : **15**
- (i) Viewing pipeline
 - (ii) Window-to-viewport transformation
 - (iii) Shearing.
4. Write and explain the Sutherland-Hodgeman polygon clipping algorithm using suitable examples. **15**

Unit III

5. Explain the following : **15**
- (i) Surface Rendering
 - (ii) Perspective Projection
 - (iii) Depth Cueing.
6. (a) Explain the concept of perspective projections in three-dimensional viewing. Also, find the transformation matrix for perspective projection. **9**
- (b) Discuss the concept of scaling and translation w.r.t. three-dimensional transformation. **6**

Unit IV

7. Explain the following : 15
- (i) B-Spline curve
 - (ii) Uniform, Periodic B-Spline
 - (iii) Cubic, Periodic B-Spline
 - (iv) Open uniform B-Spline
 - (v) Non-uniform B-Spline
 - (vi) B-Spline surfaces.
8. What are the various methods for hidden surface removal ?
Explain any *two* methods in detail. 15

Roll No.

Total Pages : 03

BT-5/D-24

45201

COMPUTER ORGANIZATION AND
ARCHITECTURE
PC-IT-305A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What is the Von Neumann Model ? Describe its key components in detail. 8
- (b) Compare the roles of CPU, cache and main memory in the structured organization of a computer system. 7
2. (a) Explain the function of computer registers in instruction execution. Why are they important ? 8
- (b) Describe the various stages of the instruction cycle. How does the timing and control unit manage these stages ? 7

Unit II

3. (a) Describe the process of bus and memory transfers. How do these transfers support instruction execution ? 7
- (b) Explain the various arithmetic microoperations in detail. 8
4. (a) Describe the design and operation of an Arithmetic Logic Shift Unit. 8
- (b) Explain the role of control memory in microprogrammed control units. 7

Unit III

5. Discuss the various types of CPU architectures, including accumulator, register, stack and memory/register and highlight the differences among them. 15
6. (a) What is a program interrupt ? How does the CPU handle interrupts during program execution ? 8
- (b) Explain the concept of immediate addressing mode. How does it differ from direct addressing mode ? 7

Unit IV

7. (a) Explain the concept of memory hierarchy. Why is it important for optimizing system performance ? 7
- (b) Discuss the role of the Input-Output Processor (IOP) in managing data transfer between the CPU and peripheral devices. 8
8. Explain the following : 15
- (i) Associative memory
 - (ii) Virtual memory
 - (iii) Auxiliary memory.

Roll No.

Total Pages : 02

BT-5/D-24

45203

COMPUTER NETWORKS

(Elective)

OE-IT-T303A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. Explain Physical and logical Topology with the help of an example. Also explain Routers, Switch and Hub with their advantages and disadvantages. **15**
2. What do you mean by OSI reference model and explain the different functions of each layer ? **15**

Unit II

3. What are different layers of TCP/IP protocol ? Also compare TCP/IP model *versus* OSI model. **15**

4. Explain the following protocols with the help of an example :
- (a) IMAP protocol
 - (b) SNMP protocol
 - (c) IPv6. **15**

Unit III

5. What are different types of media ? Explain the following media with the help of an example and diagram : **15**
- (a) Twisted pair
 - (b) Co-axial cable
 - (c) Optical fiber cable
6. (a) Explain LLC and MAC layer of data link layer. Also explain framing error control and flow control. **10**
- (b) Explain channel allocation problem with the help of an example. **5**

Unit IV

7. What do you mean by IP address class ? Also explain shortest path algorithm and distance vector routing algorithm with the help of an example. **15**
8. What is use of transport layer and also explain TCP and UDP protocol with the help of an example and diagram. **15**

IT 7th/Lib

Roll No.

Total Pages : 4

BT-7/D-24

47278

COMPILER DESIGN

Paper-PE-IT-D405A

Time Allowed : 3 Hours]

[Maximum Marks : 75

Note : Attempt five questions in all, Question No. 1 is compulsory. All questions carry equal marks.

Compulsory Question

1. Answer the following in brief : 5×3=15

- (a) What is Code optimization? How is it achieved?
- (b) Differentiate between constant propagation and variable propagation.
- (c) What are the actions performed by Shift reduce parser?
- (d) Write the rules to compute operator precedence.
- (e) Write down the five properties of Compiler.

2. (a) Show that Bottom up parsing is right most derivation in reverse order. 7

(b) Construct a DAG for the basic block whose code is as follows : 8

47278/K/907/200

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$$D = B * C$$

$$E = A + B$$

$$B = B * C$$

$$A = E - D.$$

3. (a) Construct the NFA for the following regular expressions : 8

$$R = (a + b)^*(aa + bb)(a + b)^*.$$

- (b) What is LALR parser? Construct the set of LR(1) items for this grammar. : 7

$$S \rightarrow CC$$

$$C \rightarrow aC$$

$$C \rightarrow d.$$

4. (a) Construct a SLR parsing table for the following grammar : 8

$$E \rightarrow E + T \mid T$$

$$T \rightarrow TF \mid F$$

$$F \rightarrow F * \mid a \mid b.$$

- (b) What are the common conflicts that can be encountered in shift reduce parsers? Explain. 7
5. (a) Generate an intermediate code for the following code segment with the required syntax-directed translation scheme : 8

```
int a, b;  
float c;  
a = 10;  
switch(a)  
{  
  case 10 : c = 1;  
  case 20 : c = 2;  
}
```

- (b) What is code Optimization? Explain machine dependent and independent code Optimization. 7
6. (a) What is Basic Block Optimization? Explain all the Peephole optimization technique with example. 7
- (b) Write the translation scheme to generate intermediate code for assignment statements with array references. 8
7. (a) What is meant by Activation of procedure? How it can be represented with activation tree and record? Explain with quick sort example. 8
- (b) What is Lexical analyzer and tokens? Explain the role of Lexical analyzer and specifications of the tokens. 7
8. (a) Explain the following in brief : 6
- (i) Error handling-Type Checking.

(ii) Heap Storage Management.

(iii) Input Buffering.

(b) Find the predictive parser for the given grammar and parse the sentence $(a + b)^*c$. 9

$E \rightarrow E + E$

$E \rightarrow E * E$

$E \rightarrow (E)$

$E \rightarrow id.$

Roll No.

Total Pages : 2

BT-7/D-24

47280

SOFTWARE PROJECT MANAGEMENT

Paper-PE-IT-D409A

Time Allowed : 3 Hours]

[Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT-I

1. (a) Discuss the Evolution of Software economics. 8
(b) What are various method to Reduce product size. 7
2. (a) Discuss various principles of modern Software management and usage of these principles in Software project management. 8
(b) Write and discuss various step involved in automation through. 7

UNIT-II

3. (a) Discuss various steps involve in inception and elaboration phases. 7
(b) What is Artifact? Differentiate pragmatic and management artifacts. 8

47280/K/998/200

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4. (a) List various model based Software architecture.
Explain any one model in detail. 8

(b) Write sots notes on check-points of the process. 7

UNIT-III

5. (a) Write and explain various steps involved in iterative
process planning. 8

(b) Discuss the role of various management indicators
in Software project management. 7

6. (a) What is Process automation ? How it is carried
out? 7

(b) Discuss the significance of various process
instrumentation core metrics. 8

UNIT-IV

7. (a) Explain the framework for project management and
control in detail. 8

(b) Discuss various steps involved in Visualizing progress.
7

8. (a) Explain earned value analysis with example. 8

(b) Discuss the significance of Contract Management
in Software Configuration Management. 7

Roll No. Total Pages : 2

BT-7/D-24

47283

CYBER LAW AND ETHICS

Paper-OE-IT-401A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT-I

1. Explain the following terms : 15
 - (a) Cyber Jurisdiction.
 - (b) Cyber Jurisprudence.
 - (c) Real Approach.
2. Explain the Legal and Technological significance of Domain Names. 15

UNIT-II

3. (a) Differentiate between Public and Private Cryptography. 10
- (b) Illustrate the term Certifying Authorities. 5

47283/K/878/200

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4. What is IT Act 2000. ? Explain its amendments and limitations. 15

UNIT-III

5. Differentiate between Patent Law and Trademark Law with the help of suitable examples. 15

6. Explain the following terms : 15

(a) Relevant Sections of Reserve Bank of India Act.

(b) Online dispute resolution.

(c) Criminal Procedure code.

UNIT-IV

7. Explain the B2B and B2C models in detail. Also differentiate between them. 15

8. Explain the following terms : 15

(a) Block chain Ethics.

(b) Cyber Law.

(c) Ethics in Information Society.

Roll No.

Total Pages : 05

BT-8/D-24

48357

CLOUD COMPUTING

PE-IT-A404A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Discuss the recent trends in computing paradigms, including Grid Computing, Cluster Computing, Distributed Computing, Utility Computing and Cloud Computing. Highlight the key features and differences among these paradigms. 8
- (b) Describe the evolution of cloud computing. How has cloud computing transformed over the years from its inception to the present day ? Discuss significant milestones and technological advancements that have shaped its development. 7

2. (a) Explain the NIST (National Institute of Standards and Technology) model of cloud computing. What are the essential characteristics, service models and deployment models defined by NIST ? 8
- (b) Compare and contrast Cloud Computing with Cluster Computing and Grid Computing. What are the similarities and differences between these paradigms in terms of architecture, scalability, resource management, and typical use cases ? Provide examples to support your comparison. 7

Unit II

3. (a) Compare and contrast the Cloud Computing Stack with the traditional computing architecture (client-server). Discuss the components, advantages and disadvantages of each architecture, and how they impact scalability and resource management. 8
- (b) Explain the three primary Service Models in Cloud Computing: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). Describe the services provided at each level and provide examples of providers and use cases for each model. 7

4. (a) Discuss the different Cloud Deployment Models: Public Cloud, Private Cloud, Hybrid Cloud and Community Cloud. What are the unique characteristics, benefits, and challenges associated with each deployment model ? Provide examples of scenarios where each model would be most suitable. 8
- (b) Describe the role of networks in Cloud Computing. What are the key protocols used in Cloud Computing and how do they facilitate communication and data transfer between cloud services and users ? Additionally, discuss the role of Web Services in Cloud Computing and how they support interoperability and integration of cloud-based applications. 7

Unit III

5. (a) Explain the importance of Service Level Agreements (SLAs) in Cloud Computing. How do SLAs impact the quality of service provided to users ? Additionally, discuss the role of billing and accounting in managing cloud services, and how they differ from traditional IT billing systems. 8

- (b) Compare and contrast the approaches to scaling hardware in traditional computing environments *versus* cloud computing environments. Discuss the economic benefits of cloud scaling, including cost-effectiveness, flexibility, and resource optimization. Provide examples to support your discussion. 7
6. (a) Describe the challenges and strategies for managing data in cloud computing environments. How do cloud services address scalability issues related to large-scale data processing and storage ? Discuss the role of databases and data stores in ensuring efficient data management in the cloud. 8
- (b) Analyse the case studies of Eucalyptus, Microsoft Azure, and Amazon EC2. Compare their cloud service offerings, key features, and use cases. Discuss how each platform addresses service management, scalability, and data processing to meet the needs of different users and industries. 7

Unit IV

7. (a) Discuss the various layers of security in cloud computing, focusing on Infrastructure Security and

Network level security. How do these security measures protect cloud environments from potential threats, and what challenges are associated with implementing them effectively ? 8

(b) Explain the importance of Data Security and Storage in cloud computing. What are the key concerns related to data privacy and security in the cloud ? Discuss jurisdictional issues raised by data location and how they impact compliance and regulatory requirements. 7

8. (a) Describe the role of Identity and Access Management (IAM) in cloud computing. How does IAM ensure secure access control and authentication ? Discuss the importance of trust, reputation, and risk management in establishing a robust IAM framework. 8

(b) Analyse the Cloud Contracting Model and its commercial and business considerations. What factors should organizations consider when entering into cloud service agreements ? Discuss the implications of client access in the cloud and the responsibilities of both the service provider and the client. 7

Roll No.

Total Pages : 02

BT-8/D-24

48360

CYBER SECURITY

IOE-IT-402A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) What is Cybercrime ? Explain crime against property.
(b) Briefly explain the cyber terrorism.
2. (a) Explain in detail the threats to the information system.
(b) What is the importance of security risk analysis ?
When security risk analysis is to be performed ?
3. (a) What is the main difference between virus and worm ? How one can detect and protect from them ?
(b) What are the steps to be followed for protection against Trojan horse and Backdoors ?
4. (a) Define Cyber Stalking along with its working.
Explain *two* types of Stalkers.
(b) How to prevent DDOS attack ?

5. (a) Differentiate between active and passive attacks.
(b) How to protect the databases from cyber attacks ?
6. (a) What do you mean by access control ? How does it help to provide the cyber security ?
(b) What are the features of firewall ? Write the steps in providing network security and to set Firewall Security in windows.
7. (a) Explain in detail forensics software and hardware.
(b) Explain in detail the different stages of digital forensic life-cycle.
8. (a) Discuss cyber laws and the Indian ITA, 2000.
(b) What is the punishment for hacking computers as per Indian ITA, 2000 ?

Roll No.

Total Pages : 03

BT-8/D-24

48364

INFORMATION SECURITY

OE-IT-410A

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) Explain the different types of security attacks in computer systems. How do they pose a threat to computer security ? 8
- (b) Discuss the principles of security and how they help in safeguarding computer networks. Provide examples to support your explanation. 7
2. (a) Differentiate between symmetric and asymmetric key cryptography. Provide examples of techniques used in both methods. 8
- (b) Describe the substitution and transposition techniques used in cryptography. How do these techniques ensure the security of information ? 7

Unit II

3. (a) Explain the principles of Block Cipher and describe the different modes of operation in symmetric key ciphers. 8
- (b) Discuss Differential and Linear Cryptanalysis. How are these techniques used to evaluate the security of block ciphers ? 7
4. (a) Explain the RSA algorithm in detail. How is it used in Asymmetric Key Cryptography for secure communication ? 8
- (b) Compare and contrast RSA, Diffie-Hellman and Elliptic Curve Cryptography (ECC) in terms of security, performance, and key distribution methods. 7

Unit III

5. (a) Explain the requirements for message authentication and the role of message authentication codes (MACs) in ensuring data integrity and security. 8
- (b) Discuss the working principle of the HMAC algorithm and compare it with the CMAC algorithm. 7

6. (a) Explain the Kerberos authentication protocol and how it ensures secure communication between clients and servers. 8
- (b) What is the X.509 Authentication Service ? Discuss its components and the role of Public Key Infrastructure (PKI) in digital authentication. 7

Unit IV

7. (a) Explain the working of Pretty Good Privacy (PGP) and how it ensures the confidentiality and integrity of e-Mail communication. 8
- (b) Compare and contrast Pretty Good Privacy (PGP) with S/MIME in terms of their cryptographic techniques and use cases in securing e-Mail communication. 7
8. (a) Describe the design principles of firewalls and explain, how firewalls help in protecting a network from external threats ? 8
- (b) Discuss the different types of firewalls and their roles in network security, highlighting the advantages and disadvantages of each. 7