EVEN 2025-26 IT19308 / IT19R308

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Network and Information Security**

2:30 Hours / 60 marks Enrolment No.

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Define information security **[CO1, L-U]**
b. Define i) Active attack
ii) Passive attack **[CO1, L-R]**
c. Define access control. **[CO2, L-U]**
d. State the term authentication. **[CO2, L-U]**
e. State the uses of firewall. **[CO4, L-U]**
f. Define gateways. **[CO4, L-R]**
g. Define Kerberos. **[CO5, L-U]**
h. State the term cyber stalking **[CO5, L-R]**
i. Define hacking. **[CO-5, L-U]**

Q.2 Attempt any THREE **12 Marks**

a. Define authorization. Explain audit policies. **[CO2, L-U]**
b. Explain intrusion detection system. **[CO4, L-R]**
c. Distinguish between symmetric and asymmetric cryptography. **[CO3, L-A]**
d. Explain digital forgery. **[CO5, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Write a short note on – Shoulder Surfing. **[CO2, L-U]**
b. Explain data encryption standard in brief. **[CO3, L-A]**
c. Give any four applications of firewall. **[CO4, L-A]**
d. Explain Kerberos in details **[CO-5, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Define computer security. Give any four need of computer security. **[CO1, L-U]**
b. Distinguish between Sniffing and Spoofing (any three points) **[CO1, L-A]**
c. Explain steganography in brief. **[CO-3, L-U]**
d. Explain digital signature with neat diagram. **[CO3, L-U]**
e. State and explain vulnerability assessment in brief. **[CO4, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Write a short note on i) Viruses ii) Trojan horse [CO-1, L-U]

b. Explain honeypots in detail. [CO-4, L-U]

c. Explain i) SMTP ii) PEM iii) PGP w.r.t. email security. [CO-5, L-A]

****End****

EVEN 2025-26 **IT19206/IT19R206**

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Data Communication**

2:30 Hours / 60 marks Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Define multiplexing. **[CO-3, L-R]**
b. List any two guided and unguided transmission media. **[CO-2, L-R]**
c. List any four components of data communication. **[CO-1, L-R]**
d. List any two types of switching technique. **[CO-3, L-R]**
e. List any two IEEE wireless standards. **[CO-5, L-R]**
f. Define attenuation and noise. **[CO-2, L-R]**
g. Define the FDMA. **[CO-3, L-R]**
h. Write the meaning of protocol and medium. **[CO-1, L-R]**
i. Define the term DSSS. **[CO-3, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Differentiate between analog and digital signals with an examples. **[CO-1, L-U]**
b. Describe working of coaxial cable. **[CO-2, L-U]**
c. Discuss fixed-size and variable size framing with example. **[CO-4, L-A]**
d. Explain the concept of infrared and RF wireless communication. **[CO-5, L-A]**

Q. 3 Attempt any THREE **12 Marks**

a. Explain cyclic redundancy check (CRC) with a simple example. **[CO-4, L-U]**
b. Compare virtual and circuit switched network. **[CO-3, L-U]**
c. Explain how microwave communication works. **[CO-2, L-A]**
d. Explain the significance of bandwidth in data communication. **[CO-1, L-A]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain simplex, half duplex and full duplex communication with diagrams. **[CO-1, L-U]**
b. Discuss line-of-sight communication with example. **[CO-2, L-A]**
c. Differentiate between error detection and error correction. **[CO-4, L-U]**
d. Explain datagram network. **[CO-3, L-A]**
e. Explain the architecture of Bluetooth communication. **[CO-5, L-U]**

Q. 5 **Attempt any TWO** **12 Marks**

a. Analyze the advantages and limitations of 4G and VoLTE for mobile internet usage in urban vs rural environments. **[CO-5, L-A]**

b. Describe the concept of forward error correction with example. **[CO-4, L-A]**

c. Compare the performance of fiber optic and satellite links in a remote data transmission application. **[CO-2, L-A]**

****End****

EVEN 2025-26

CO19405/CO19R405

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Cloud Computing**

2:30 Hours/ 60 marks Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO- COURSE OUTCOMES; L- LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Enlist any four cloud risk. **[CO-5, L-R]**
b. State any two benefits of virtual data centre. **[CO-2, L-R]**
c. Define VSAN. **[CO-3, L-R]**
d. Define cloud computing. **[CO-1, L-R]**
e. State any two applications of home based cloud computing. **[CO-6, L-R]**
f. Give any two technical risks. **[CO-5, L-R]**
g. Enlist different cloud service models. **[CO-1, L-R]**
h. Difference between GFS and HDFS (any two). **[CO-3, L-U]**
i. State any two uses of cloud portal. **[CO-4, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Sketch & explain life cycle of SLA. **[CO-4, L-A]**
b. Explain architecture of cloud computing. **[CO-1, L-U]**
c. Describe any four applications of energy aware cloud computing. **[CO-6, L-U]**
d. What is virtualization? Give any one application of virtualization. **[CO-2, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. List and explain any four general issues in securities of cloud computing. **[CO-5, L-U]**
b. Analyze how VMWARE helps users. **[CO-2, L-A]**
c. Explain architecture of VDC. **[CO-3, L-U]**
d. Explain any application of cloud stack. **[CO-6, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Difference between block level and file level storage virtualization. (any. three) **[CO-3, L-U]**
b. Analyze Google App engine. **[CO-6, L-A]**
c. Give any three disadvantage of virtualization. **[CO-2, L-R]**
d. Describe storage system architecture. **[CO-3, L-U]**
e. Explain types of SLA. **[CO-4, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain types of cloud services with advantages and disadvantages. **[CO-1, L-U]**

b. What phases of cloud service life cycle are required to provide cloud services in your institute? Justify your answer. **[CO-4, L-A]**

c. Explain security as a cloud service with advantage and disadvantage. **[CO-5, L-U]**

****End****

EVEN 2025-26 IT19204 / IT19R204

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Digital Techniques**

2:30 Hours / 60 marks Enrolment No.

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Convert $(101101)_2$ to decimal. **[CO-1, L-A]**
b. Perform subtraction: $(1010)_2 - (1001)_2$ **[CO-1, L-A]**
c. Draw logic symbol of AND gate and NOT gate. **[CO-2, L-R]**
d. State De Morgan's theorems. **[CO-3, L-U]**
e. State the function of select lines in a MUX. **[CO-4, L-U]**
f. List the types of shift registers. **[CO-4, L-R]**
g. State the concept of preset and clear inputs. **[CO-4, L-R]**
h. Define DAC and ADC. **[CO-5, L-R]**
i. State the specifications of ADC. (Any two points). **[CO-5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Explain binary to decimal and decimal to binary conversion methods. **[CO-1, L-U]**
b. Explain universal logic gates with truth table, symbol, and Boolean Equation. **[CO-2, L-U]**
c. Explain the working of 4:1 multiplexer with logic diagram and truth table. **[CO-4, L-U]**
d. Explain the working of serial-in serial-out (SISO) shift register with diagram. **[CO-4, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Design a 8:1 multiplexer using 4:1 multiplexer. **[CO-4, L-A]**
b. Describe the operation of a 4 bit comparator using IC7485. **[CO-4, L-U]**
c. Explain 3-bit synchronous counter with timing diagram. **[CO-4, L-U]**
d. Explain working of R-2R ladder type DAC with neat diagram. **[CO-5, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Convert $(58)_{BCD}$ to the Excess-3 code. **[CO-1, L-A]**
b. State the steps to perform subtraction using 2's complement. **[CO-1, L-U]**
c. Add the following binary number- [1010111 + 1011011] **[CO-1, L-A]**
d. Derive all basic gates using universal gates. **[CO-2, L-U]**
e. Simplify the following expression using Boolean Laws: (A+B) (A+C). **[CO-3, L-A]**

Q. 5 Attempt any TWO **12 Marks**

a. Minimize the following Boolean function using K-map and construct reduced Boolean expression using logic gates
$F (A, B, C, D) = \Sigma m (1, 3, 4, 6, 8, 9, 11, 13, 15) + \Sigma d (0, 2, 14)$. **[CO-3, L-A]**
b. Design a full adder using K-map and realize using gates. **[CO-4, L-A]**
c. Explain the working of SR flip flop with logic diagram and truth table. **[CO-4, L-U]**

****End****

EVEN 2025-26

IT19401/IT19R401

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Python Programming**

2:30 Hours / 60 marks Enrolment No.

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO- COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. State comments in python. **[CO-1, L-R]**
b. Define tuple in python. **[CO-1, L-R]**
c. List different object oriented features supported by python. **[CO-2, L-R]**
d. State seek() method in file handling. **[CO-3, L-R]**
e. Define readlines() method in file handling. **[CO-3, L-R]**
f. State wt mode in file. **[CO-3, L-R]**
g. Define search() method in regular expression. **[CO-4, L-R]**
h. Define place layout manger. **[CO-5, L-R]**
i. State method to create rectangle on canvas. **[CO-5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Explain keyword argument function with example. **[CO-1, L-U]**
b. Explain constructor method in class. **[CO-2, L-U]**
c. Illustrate use of 'with' statement in file with example. **[CO-3, L-U]**
d. Write a program to create a regular expression to retrieve all the words having length of at least 4 characters. Str = 'one two three four five six'. **[CO-4, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Write output of following
List = [1,2,3,4,5,6,7,8,9,10]
List [2:6], List [:7], List [-1:-5]
List [4:] **[CO-1, L-A]**
b. Write a program for constructor overriding. **[CO-2, L-A]**
c. Explain following quantifiers in regular expression +, *, {m}, {m,n}. **[CO-4, L-U]**
d. Write a program to create three button and change background color according to button. **[CO-5, L-A]**

Q. 4 Attempt any FOUR **12 Marks**

a. Describe for loop. **[CO-1, L-U]**
b. Explain super() method in inheritance. **[CO-2, L-U]**
c. Write a program to append data to file. **[CO-3, L-A]**
d. Explain write() and writelines() method. **[CO-3, L-A]**
e. Explain findall() method with example. **[CO-4, L-A]**

EVEN 2025-26

Q. 5 Attempt any TWO **12 Marks**

a. Describe list in python with following operations i) Append ii) Delete iii) Insert iv) Clear. Take suitable example of list. **[CO-1, L-A]**

b. Write a program for Armstrong number. **[CO-1, L-A]**

c. Develop a program to create 3 check button and display the options selected by user. **[CO-5, L-A]**

****End****

EVEN 2025-26 CO19R305/CO19305

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : Information Technology
Course Title : Computer Networks

2:30 Hours / 60 marks Enrolment No. | | | | | | | | |

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO-COURSE OUTCOMES, L- LEVELS

Q.1 Attempt any SIX **12 Marks**

a. List benefits and applications of computer network. **[CO-1, L-R]**
b. Draw suitable diagram for client server architecture. **[CO-1, L-U]**
c. Give classification of communication media. **[CO-2, L-R]**
d. Explain the logical address and physical address in computer networks. **[CO-2, L-U]**
e. State any two differences between Switch and Hub. **[CO-3, L-R]**
f. List all layers of ISO-OSI model starting from bottom to up. **[CO-4, L-R]**
g. List any four application layer protocols. **[CO-5, L-R]**
h. Define IP address. State its classes. **[CO-5, L-R]**
i. What are the advantages of Wi-Fi? **[CO-6, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Compare MAN and WAN networks (any four points). **[CO-1, L-U]**
b. Explain with neat labelled diagram TCP/IP reference model. **[CO-4, L-U]**
c. What is DNS server? Describe concept of DNS. **[CO-5, L-U]**
d. Write a note on CSMA/CD. **[CO-6, L-R]**

Q. 3 Attempt any THREE **12 Marks**

a. Describe the construction of fiber optic cable with neat diagram. **[CO-2, L-U]**
b. Explain functions of network layer in OSI model. **[CO-4, L-R]**
c. Write a note on Ethernet IEEE standard 802.3. **[CO-6, L-R]**
d. Explain in details Bluetooth architecture. **[CO-6, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Describe LAN with its advantages. **[CO-1, L-U]**
b. Differentiate between circuit switching and packet switching (any three points). **[CO-2, L-U]**
c. Compare TCP/IP model with OSI model. **[CO-4, L-U]**
d. Write a note on ARP protocol. **[CO-5, L-U]**
e. Draw and explain UDP protocol header format. **[CO-5, L-A]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain in details network connecting devices i) Router ii) Repeater. **[CO-3, L-U]**

b. Explain any two application layer protocols in details. **[CO-4, L-U]**

c. What is IPv6? Find out the class of following IPv4 addresses i) 191.168.0.1 ii) 10.0.0.1 iii) 245.32.14.16 iv) 221.10.10.10. **[CO-5, L-A]**

≈≈≈≈End≈≈≈≈

EVEN 2025-26 IT\9R304/IT19304

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : Information Technology
Course Title : Microcontroller and Embedded System

2:30 Hours / 60 marks Enrolment No. | | | | | | | |

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES. L-LEVELS

Q.1 Attempt any SIX **12 Marks**

a. State the functions of following pins of 8051 microcontroller (i) TxD (ii)PSEN. **[CO1, L-R]**
b. Draw the format of PSW of 8051 and give the functions of each bit. **[CO1, L-U]**
c. Explain stack operation of 8051 with one example. **[CO2, L-U]**
d. State the functions performed by 8051 timers. **[CO3, L-R]**
e. How to calculate delay between two periodic events of 8051 in timer mode & counter mode. **[CO3, L-A]**
f. Draw & explain organization program memory. **[CO4, L-R]**
g. Draw timing diagram for external data memory write cycle. **[CO4, L-R]**
h. Compare RISC and CISC processors. (Two Points) **[CO5, L-A]**
i. State the features of Arduino. **[CO5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Explain Bit control addressing modes with instructions. Draw the format of 3 byte instruction. **[CO2, L-U]**
b. Draw format of IE register and explain the functions of each bit. **[CO3, L-U]**
c. Draw & explain interfacing of LCD with 8051. **[CO4, L-U]**
d. Draw & explain functional block diagram of Arduino. **[CO5, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Write an assembly language program to add two 16 bit numbers. The result must be stored in internal data memory. The 16 bit numbers are also stored in internal data memory locations. **[CO2, L-A]**
b. Explain Traffic light controller using 8051 with neat diagram. **[CO4, L-U]**
c. Give classification of embedded system. Explain any two. **[CO5, L-U]**
d. Draw interfacing of seven segment display with Arduino & explain. **[CO5, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain power saving options of 8051. **[CO1, L-U]**
b. Explain any four logical instructions. **[CO2, L-U]**
c. Explain different types of interrupt present in 8051. **[CO3, L-U]**

PTO

d. Write a program to generate triangular wave using DAC & 8051. **[CO4, L-A]**

c. State different applications using Arduino. Explain any one. **[CO5, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Draw & explain memory organization of microcontroller 8051. Explain data memory. **[CO1, L-U]**

b. Write a program in 'C' that divide the data from RAM location by the numbers 11H, put the quotient and remainder in two different locations. Assume suitable data and locations. **[CO2, L-A]**

c. Draw interfacing of stepper motor with 8051. Write a program to rotate motor in anticlockwise rotation with angle 1.8 °. **[CO4, L-A]**

≈≈≈≈End≈≈≈≈

EVEN 2025-26 IT19404 / IT19R404

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Software Testing & Quality Assurance**

2:30 Hours / 60 marks Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. State classification of white box testing. [CO-2, L-R]
b. Define test cases. [CO-1, L-R]
c. Define Unit testing. [CO-2, L-R]
d. State phases of STLC. [CO-3, L-R]
e. State Classification of Defect. [CO-4, L-R]
f. State limitations of Manual testing. [CO-5, L-R]
g. Define following terms: i) Failure
ii) Defect [CO-1, L-R]
h. Enlist features of test tool. [CO-5, L-R]
i. Differentiate between static and dynamic testing. (Any two) [CO-2, L-A]

Q.2 Attempt any THREE **12 Marks**

a. Write test cases for ATM. [CO-3, L-A]
b. Describe code coverage testing with example. [CO-2, L-U]
c. Differentiate between Alpha and Beta testing. (Any four points) [CO-2, L-U]
d. Explain Entry and Exit criteria. [CO-1, L-U]

Q. 3 Attempt any THREE **12 Marks**

a. Explain Equivalence partitioning testing with example. [CO-2, L-U]
b. Design test case for Notepad. (Any four) [CO-5, L-A]
c. Write short note on i) Stress testing ii) Usability testing. [CO-2, L-U]
d. Describe Defect Management Process. [CO-4, L-U]

Q. 4 Attempt any FOUR **12 Marks**

a. Differentiate between manual testing and Automatic testing [CO-5, L-A]
b. Explain need of staffing in test planning. [CO-3, L-A]
c. Write short note on Reporting a Defect. [CO-4, L-U]
d. State following testing i) Regression testing.
ii) Sanity testing. [CO-2, L-U]
e. Differentiate between stab and Driver. [CO-2, L-A]

Q. 5 Attempt any TWO **12 Marks**

a. Draw and Explain Defect life cycle. **[CO-4, L-U]**

b. Describe Test Summary Report with example. **[CO-3, L-A]**

c. Explain following testing i) positive and Negative testing ii) Boundary Value Analysis. **[CO-2, L-A]**

****End****

EVEN 2025-26

IT23111

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology**
Course Title : **Network and Information Security**

2:30 Hours / 60 marks Enrolment No. | | | | | | | | | | | |

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L= LEVELS

Q.1 Attempt any SIX **12 Marks**

a. List the types of Attacks. **[CO-1, L-U]**
b. State the need of firewall. **[CO-4, L-R]**
c. Define piggybacking attack. **[CO-2, L-R]**
d. State the need of computer security. **[CO-1, L-R]**
e. Define cryptanalysis. **[CO-3, L-U]**
f. List the types of viruses. **[CO-1, L-R]**
g. Enlist policies of Access controls. **[CO-1, L-U]**
h. Define cipher text. **[CO-3, L-R]**
i. Define Digital Certificate. **[CO-5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Discuss Firewall policies and their implementation. **[CO-4, L-U]**
b. Explain Shoulder Surfing and how to prevent it. **[CO-2, L-U]**
c. Explain the working of Kerberos. **[CO-5, L-U]**
d. Explain phases of virus life cycle with neat diagram. **[CO-1, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Describe structure of X.509 certificate. **[CO-5, L-A]**
b. Differentiate cryptography and steganography. (Any four points) **[CO-3, L-A]**
c. Describe the architecture of DMZ. **[CO-4, L-U]**
d. Explain types of attacks. **[CO-1, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain the terms Network bared IDS and Hot based IDS. **[CO-4, L-U]**
b. Explain Dumpster Diving. **[CO-2, L-U]**
c. Differentiate between Virus and Worm. **[CO-1, L-A]**
d. Describe retinal scanning system. **[CO-2, L-U]**
e. Define cyber crime and discuss Hacking digital forgery, Cyber stalking. **[CO-5, L-R]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain types of Firewall. **[CO-4, L-U]**

b. Convert the given plains text to cipher text using Caeser cipher. Assume suitable data.
Plain text = CRYPTOGRAPHY
Key = 3 **[CO-3, L-A]**

c. Describe Public Key Infrastructure (PKI) in detail including CA, RA and X.509 **[CO-5, L-U]**

****End****

EVEN 2025-26 **IT23107**

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Java Programming**

2:30 Hours / 60 marks Enrolment No. | | | | | | | | |

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Enlist decision making & looping statements in java. **[CO-1, L-U]**
b. Define strings. **[CO-2, L-U]**
c. State variable length argument. **[CO-2, L-R]**
d. Define exception. **[CO-4, L-U]**
e. Define multithreading. **[CO-4, L-U]**
f. Define lambda expression. **[CO-5, L-R]**
g. Define streams. **[CO-6, L-U]**
h. Enlist four methods present in java.util.scanner class. **[CO-6, L-U]**
i. Define vector. **[CO-7, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Write a program to demonstrate constructor overloading in java. **[CO-2, L-U]**
b. Explain 'Throws' keyword with example. **[CO-4, L-U]**
c. Explain lambda expression with example. **[CO-5, L-U]**
d. Distinguish between byte stream & character stream classes. **[CO-6, L-A]**

Q. 3 Attempt any THREE **12 Marks**

a. Explain public static void main() method in java. **[CO-1, L-U]**
b. Write a program to implement method overriding in java. **[CO-3, L-A]**
c. State & explain default methods & functional interface in java. **[CO-5, L-U]**
d. Write a program to read data from a file in the form of bytes. **[CO-6, L-A]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain abstract classes with example. **[CO-3, L-U]**
b. Explain use of super keyword w.r.t inheritance. **[CO-3, L-U]**
c. Explain type parameter with example. **[CO-5, L-R]**
d. Explain bounded generics with example. **[CO-5, L-U]**
e. Write a short note on collections in java. **[CO-7, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Write a short note on – i) Visibility controls, ii) Static modifier. **[CO-2, L-U]**
b. Write a program to implement multiple inheritance in java. **[CO-3, L-A]**
c. Explain thread's life cycle with neat diagram. **[CO-4, L-U]**

****End****

EVEN 2025-26 **IT23501**

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (SP)**
Course Title : **Microcontroller & Embedded System**

2:30 Hours / 60 marks Enrolment No.

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. State idle and power saving mode of microcontroller 8051. **[CO-1, L-R]**
b. State Boolean operation in 8051. **[CO-1, L-U]**
c. Compare microprocessor and microcontroller (any 4 points). **[CO-1, L-R]**
d. Define stack in 8051. **[CO-2, L-R]**
e. Give function of pins $\overline{PSEN}$ and ALE in 8051. **[CO-4, L-R]**
f. Draw block diagram of embedded system. **[CO-5, L-R]**
g. List applications of Arduino. **[CO-5, L-A]**
h. Draw functional block diagram of Arduino. **[CO-5, L-R]**
i. State the function of pin13 in Arduino. **[CO-5, L-U]**

Q.2 Attempt any THREE **12 Marks**

a. Draw memory organization of 8051 and explain it. **[CO-1, L-U]**
b. Explain : (i) LCALL (ii) ACALL (iii) SJMP (iv) LJMP. **[CO-2, L-U]**
c. List the different timer modes of 8051. Explain each mode. **[CO-3, L-U]**
d. Draw interfacing diagram of 8051 with LCD. Give function of RS pin and R/W pin of LCD. **[CO-4, L-A]**

Q. 3 Attempt any THREE **12 Marks**

a. Draw pin diagram of 8051 and give function of port 3 pins. **[CO-1, L-U]**
b. Write an ALP to add two 8 bit data using 8051. Assume necessary data. (use assembly or C-language) **[CO-2, L-A]**
c. What is synchronous communication and asynchronous communication? Give function of SBUF. **[CO-3, L-R]**
d. Write an ALP to generate square wave on pin P1.3. Assume necessary data. (use assembly or C-language) **[CO-4, L-A]**

Q. 4 Attempt any FOUR **12 Marks**

a. Write an ALP to transfer block of five 8-bit numbers from internal memory 20H to 24H to internal data memory 40H to 44H using 8051. **[CO-2, L-A]**
b. Explain polling method and interrupt method in 8051? Which method is more advantageous? Why? **[CO-3, L-U]**
c. Draw interfacing diagram of stepper motor with 8051 and write ALP to rotate it clockwise. Assume necessary data. **[CO-4, L-A]**

d. Differentiate between Harvard & Von Neumann architecture (any four points). **[CO-5, L-U]**

e. Explain decision making techniques in Arduino. **[CO-5, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Enlist different addressing modes of 8051. Explain with one example each. **[CO-2, L-U]**

b. Draw interfacing diagram of 8051 and ADC 0808 and explain it. **[CO-4, L-A]**

c. Describe I/O functions of Arduino for analog signal and digital signal. How many I/O ports are in Arduino? **[CO-5, L-U]**

****End****

EVEN 2025-26 **IT23102**

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **CO/ IF (Sandwich Pattern)**
Course Title : **Logic Development using C programming**

2:30 Hours / 60 marks Enrolment No. | | | | | | | | | | |

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO -COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Define algorithm. **[CO-1, L-R]**
b. Define variable. **[CO-2, L-R]**
c. Draw any four notations of flowchart with its meaning. **[CO-1, L-R]**
d. List any four data types. **[CO-2, L-R]**
e. List any four string functions. **[CO-5, L-R]**
f. List CRUD operations on file. **[CO-6, L-R]**
g. Define pointer. **[CO-7, L-R]**
h. Create a structure to store roll_no, name and percentage of three students. **[CO-6, L-A]**
i. State the use of * and & in pointers. **[CO-7, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Write a program to print numbers from 10 to 1 using any looping statement. **[CO-3, L-A]**
b. Write a program to print numbers from 1 to 10 using array. **[CO-4, L-A]**
c. Explain creation of file with example. **[CO-6, L-U]**
d. List pointer arithmetic operations. Explain any one operation with example. **[CO-7, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Write an algorithm to exchange the values of two variables with temporary variable. **[CO-1, L-A]**
b. Write a program to accept an integer from user and print it. **[CO-2, L-A]**
c. Write a program to print smallest number among two numbers using decision making statement. **[CO-3, L-A]**
d. Explain string input / output with example. **[CO-4, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Draw the flowchart to exchange the values of two variables with temporary variable **[CO-1, L-A]**

b. Compare Procedural, object Oriented and Event Driven approaches. (any three points) **[CO-2, L-U]**

c. Compare local and Global variables (any three points) **[CO-5, L-U]**

d. Compare Structure and Union (any three points) **[CO-6, L-U]**

e. State the meaning of following:

i) int num = 10 ;

ii) int * p ;

iii) p = & num ; **[CO-7, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Write a program to print numbers in following manner;

1 2 3 5 6 7 8 9

Using continue statement. **[CO-3, L-A]**

b. Write a program to illustrate array of strings. **[CO-4, L-A]**

c. Explain User- Defined function with example. **[CO-5, L-U]**

****End****

EVEN 2025-26

IT23106

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Database Management Systems**

2:30 Hours/ 60 marks Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary.
6. CO -COURSE OUTCOMES, L- LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Define exception in PL/SQL. **[CO-6, L-R]**
b. State the use of shared lock and exclusive lock. **[CO-5, L-R]**
c. List types of triggers. **[CO-6, L-R]**
d. Define normalization. **[CO-4, L-R]**
e. Enlist the types of database users. **[CO-1, L-R]**
f. State the difference between where and having clause. **[CO-2, L-R]**
g. Define functional dependency. **[CO-4, L-R]**
h. State any two advantages of concurrent execution of transaction. **[CO-5, L-R]**
i. Define data abstraction. **[CO-1, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Draw transaction states diagram in DBMS and explain each state. **[CO-5, L-U]**
b. Explain the concept of left outer join and right outer join with suitable example. **[CO-2, L-U]**
c. Explain hierarchical and network model with suitable example. **[CO-1, L-U]**
d. Draw ER diagram for hospital management system. **[CO-3, L-A]**

Q. 3 Attempt any THREE **12 Marks**

a. A company wants to show only name and department from the employee table and hide salary. How can a view be used to do this? **[CO-2, L-A]**
b. Explain any one type of cursor with suitable example. **[CO-6, L-U]**
c. Differentiate specialization and generalization. **[CO-3, L-U]**
d. Explain 3NF and BCNF with example. **[CO-4, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Write syntax and give example of any three DML commands. **[CO-2, L-A]**
b. Explain applications of DBMS. **[CO-1, L-U]**
c. Describe insertion anomaly with an example. **[CO-4, L-U]**
d. Explain storage manager with its sub-components. **[CO-1, L-R]**
e. Describe multivalued dependency with example. **[CO-4, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain concurrent execution and its associated problems with examples. **[CO-5, L-U]**

b. A college want to manage student records using a database. The database should store details such as student ID, Name, Course and Marks
1. Create a table to store student details
2. Insert at least two student records
3. Update the marks of a student
4. Delete a student record
5. Display all student records
6. Display students names whose marks are above 70% **[CO-2, L-A]**

c. Write PL/SQL block to accept a number and check whether it is even or odd. **[CO-6, L-A]**

****End****

EVEN 2025-26

IT23110

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Cloud Computing**

2:30 Hours / 60 marks

Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 **Attempt any SIX** **12 Marks**

a. Enlist types of virtualization. **[CO-2, L-R]**
b. Enlist different types of cloud file systems. **[CO-3, L-R]**
c. State characteristics of cloud computing. **[CO-1, L-R]**
d. Give any two types of service level agreement. **[CO-4, L-R]**
e. State any two cloud service models. **[CO-1, L-R]**
f. State block level storage virtualization. **[CO-3, L-R]**
g. Enlist any two cloud risks in cloud computing. **[CO-5, L-R]**
h. State RFID. **[CO-6, L-R]**
i. Enlist the technologies adopted in IOT. **[CO-6, L-R]**

Q.2 **Attempt any THREE** **12 Marks**

a. Describe paas in cloud service. **[CO-1, L-U]**
b. Write a short note on Microsoft Hyper-v. **[CO-2, L-U]**
c. Explain storage system architecture with neat diagram. **[CO-3, L-U]**
d. Explain service level agreement (SLA). **[CO-4, L-U]**

Q. 3 **Attempt any THREE** **12 Marks**

a. State advantages of virtualization and explain vm migration. **[CO-2, L-U]**
b. Explain cloud file system with example. **[CO-3, L-U]**
c. Explain service catalog in cloud management. **[CO-4, L-U]**
d. Explain how internet of things can be used in innovative applications. **[CO-6, L-U]**

Q. 4 **Attempt any FOUR** **12 Marks**

a. Write generic steps to build a virtual machine using vmware on the OS. **[CO-2, L-A]**
b. Distinguish between GFS & HDFS (any four points). **[CO-3, L-U]**
c. Explain content level security. **[CO-5, L-A]**
d. Explain cloud risk in cloud security management. **[CO-5, L-U]**
e. Write a short note on amazon EC2 cloud platform. **[CO-6, L-A]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain storage system architecture. **[CO-3, L-A]**

b. Explain cloud service life cycle with neat diagram. **[CO-4, L-A]**

c. Explain in detail security as a cloud service. **[CO-5, L-A]**

****End****

EVEN 2025-26 **IT23108**

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Software Engineering**

2:30 Hours / 60 marks Enrolment No.

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. State the difference between system software and application software. **[CO-1, L-R]**
b. State the term "Time-boxing" in agile. **[CO-3, L-R]**
c. Define the term RMMM. **[CO-6, L-R]**
d. Define prototype in evolutionary model. **[CO-2, L-R]**
e. Define validation in requirement engineering. **[CO-4, L-R]**
f. State the use of white-box testing. **[CO-5, L-R]**
g. List any two software myths. **[CO-1, L-R]**
h. Mention any one tool used in agile methodology and its use. **[CO-3, L-R]**
i. State any two activities in project planning. **[CO-6, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Explain software components with suitable examples. **[CO-1, L-U]**
b. Explain the incremental model with an example. **[CO-2, L-U]**
c. Describe the process of requirement specification and validation with suitable example. **[CO-4, L-U]**
d. Write down the four test-cases for a "Forgot Password" feature. **[CO-5, L-A]**

Q. 3 Attempt any THREE **12 Marks**

a. Identify a suitable process model for a health care system and justify the answer. **[CO-2, L-A]**
b. Explain eliciting requirements in detail. **[CO-4, L-U]**
c. Explain the importance of verification in design. **[CO-5, L-U]**
d. Describe the role of metrics in software estimation with examples. **[CO-6, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain function point analysis with a simple example. **[CO-6, L-U]**
b. Identify software characteristics needed for a banking system. **[CO-1, L-A]**
c. Compare V-model and waterfall model. **[CO-2, L-U]**
d. Differentiate between scrum and DSDM models. **[CO-3, L-U]**
e. Illustrate the 4P's of project management with software case. **[CO-6, L-A]**

Q. 5 Attempt any TWO **12 Marks**

a. Develop an agile-based release plan for a food delivery application. **[CO-3, L-A]**

b. Explain SRS need, format and specification. **[CO-4, L-A]**

c. Design a data flow diagram (level 0 and 1) for a university admission process. **[CO-5, L-A]**

****END****

IT23201

EVEN 2025-26

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : Information Technology (Sandwich Pattern)
Course Title : Python Programming

2:30 Hours / 60 marks Enrolment No. | | | | | | | | | | |

Instructions:
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Enlist the basic building blocks of python programming. **[CO-1, L-R]**
b. Define indention in python program. **[CO-1, L-R]**
c. Give example of identity operator in python. **[CO-1, L-R]**
d. State the syntax of for loop. **[CO-1, L-R]**
e. Define self-variable in class. **[CO-2, L-R]**
f. Define syntax of exception handling in python. **[CO-2, L-R]**
g. Write a syntax to open a file in write mode. **[CO-3, L-R]**
h. Define match() method in regular expression. **[CO-4, L-R]**
i. Enlist database systems that can be connected to python. **[CO-5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Describe any four operations on list data type. **[CO-1, L-U]**
b. Explain constructor overriding with example. **[CO-2, L-A]**
c. Write the use of syntax for following methods : i) Open() ii) Read() iii) Seek() iv) Tell(). **[CO-3, L-U]**
d. Write the syntax of tkinter widgets to create triangle and rectangle on canvas. **[CO-5, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. Write program to check whether given number is Armstrong. **[CO-2, L-A]**
b. Write a note on except block in python. **[CO-3, L-U]**
c. Write a python program to develop RE to find word with 3 character length. **[CO-4, L-A]**
d. How to connect MySQL database using MySQL-connector in python. **[CO-5, L-A]**

Q. 4 Attempt any FOUR **12 Marks**

a. Explain python datatype - dictionary with insertion operation. **[CO-1, L-U]**
b. Differentiate between list and tuple datatype. **[CO-1, L-U]**
c. Explain variable length argument with example. **[CO-1, L-A]**
d. Give the use of break, continue & pass statement in python. **[CO-1, L-U]**
e. Write regular expression to find word start with m of any length. **[CO-4, L-A]**

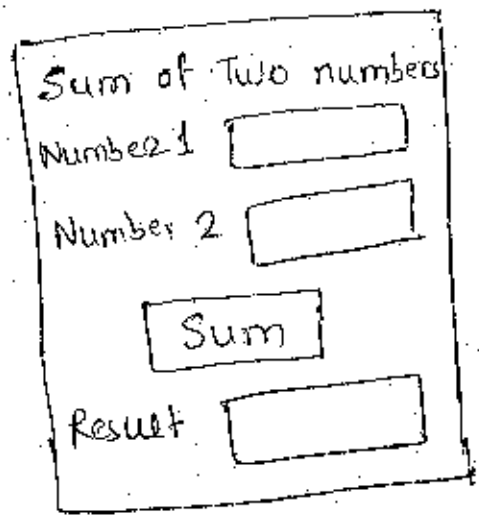
EVEN 2025-26

Q. 5 Attempt any TWO **12 Marks**

a. Write a python program to implement multiple inheritance. **[CO-2, L-A]**

b. Write a note on pattern matching & searching in python explain any two methods with example. **[CO-4, L-U]**

c. Write the T Kinter program to add two numbers as per given GUI. **[CO-5, L-A]**



****End****

EVEN 2025-26

IT23204

GOVERNMENT POLYTECHNIC MUMBAI
TERM END EXAMINATION

Programme : **Information Technology (Sandwich Pattern)**
Course Title : **Software Testing & Quality Assurance**

2:30 Hours/ 60 marks Enrolment No. | | | | | | | |

***Instructions*:**
1. Attempt all the questions.
2. Illustrate your answers with neat sketches wherever necessary.
3. Use of Mathematical Tables, Steam Table and Pocket Calculator (non-programmable) is permissible.
4. Marks on Right Hand Side indicate full marks for the question.
5. Assume suitable additional data, if necessary
6. CO=COURSE OUTCOMES, L=LEVELS

Q.1 Attempt any SIX **12 Marks**

a. Define software testing. **[CO-1, L-R]**
b. Define : (i) Quality assurance (ii) Quality control. **[CO-1, L-U]**
c. State any two uses of black box testing. **[CO-2, L-U]**
d. Enlist the uses of drivers in unit testing. **[CO-3, L-U]**
e. Define smoke testing. **[CO-3, L-R]**
f. Differentiate between alpha and beta testing. **[CO-3, L-A]**
g. Enlist the steps uses in test process. (In test management) **[CO-4, L-U]**
h. Define defect. **[CO-5, L-U]**
i. State phases of STLC. **[CO-5, L-R]**

Q.2 Attempt any THREE **12 Marks**

a. Write down four test cases for notepad. **[CO-1, L-A]**
b. Explain boundary value analysis with example. **[CO-2, L-U]**
c. Describe bi-directional integration testing. **[CO-3, L-U]**
d. Explain defect life cycle with neat diagram. **[CO-5, L-U]**

Q. 3 Attempt any THREE **12 Marks**

a. State and explain how decision tables can be used in black box testing. **[CO-2, L-U]**
b. Explain acceptance testing. **[CO-3, L-R]**
c. Write a short note on test management. **[CO-4, L-A]**
d. Define automation testing. State the need of automation testing. **[CO-6, L-U]**

Q. 4 Attempt any FOUR **12 Marks**

a. Distinguish between white box testing and black box testing. **[CO-2, L-A]**
b. Explain test summary report. **[CO-4, L-U]**
c. Explain positive and negative testing with example. **[CO-4, L-U]**
d. Enlist advantages and disadvantages of using testing tools. **[CO-6, L-A]**
e. Give short note on selecting tool for testing. **[CO-6, L-U]**

Q. 5 Attempt any TWO **12 Marks**

a. Explain (i) Code – coverage testing (ii) Code - complexity testing with example. **[CO-2, L-U]**

b. Write short note on : (i) Regression testing (ii) Sanity testing. **[CO-3, L-A]**

c. Write 6 test cases for ATM machine. **[CO-5, L-A]**

****End****