Electronics & Computer Science Engineering OCT-NOV 2025 NEP 2.0-3rd sem & CBCS-3rd,4th,5th,6th,7th sem						
SN	Sem.	Pattern	Branch	Year	Sub code	Subject
1	III	NEP 2.0	ECS	2	112465	Data Structure & Algorithm
2	III	NEP 2.0	ECS	2	112367	Computer Aided Design(MECHT)
3	III	NEP 2.0	ECS	2	113436	Entrepreneurship
4	III	NEP 2.0	ECS	2	112463	Control & Instrumentation
5	III	NEP 2.0	ECS	2	112464	Analog Circuits
6	III	B Tech	ECS	2	91971	Digital Electronics
7	III	B Tech	ECS	2	91969	Engineering Mathematics III
8	IV	B Tech	ECS	2	91979	Discrete Structures and Automata Theory
9	IV	B Tech	ECS	2	91975	Electronic Circuits
10	IV	B Tech	ECS	2	79118	Environmental Studies
11	IV	B Tech	ECS	2	91976	Controls and Instrumentation
12	IV	B Tech	ECS	2	91977	Computer Network
13	V	B Tech	ECS	3	56537	Signal & System
14	V	B Tech	ECS	3	56538	Power Electronics
15	V	B Tech	ECS	3	56539	Computer Organization & Architecture
16	V	B Tech	ECS	3	56540	Computer Network II
17	V	B Tech	ECS	3	56541	Sensors & Applications
18	VI	B Tech	ECS	3	56544	Digital Signal Processing
19	VI	B Tech	ECS	3	56545	PLC & Automation
20	VI	B Tech	ECS	3	56550	Internet of Things(ECS)
21	VII	B Tech	ECS	4	113053	Cloud Computing
22	VII	B Tech	ECS	4	113049	VLSI Design
23	VII	B Tech	ECS	4	113050	Machine Learning using Python
24	VII	B.Tech	ECS	4	113051	Digital Image Processing
25	VII	B.Tech	ECS	4	113052	Video Engineering

QP-9927

Seat No. ECS-5th Sem 33

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Signal & System

Sub. Code: 56537

Day and Date: Friday ,12-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:

Special Inst.:
1. **Q.1 is compulsory.**
2. **Solve any 4 questions from remaining questions.**
3. **Use non-programmable calculator is permissible.**
4. **Figures to the right indicate full marks.**
5. **Assume suitable data, if required.**

Q1) Solve following MCQ. **[10]**

i. Discrete time signal is derived from continuous time signal by _____ process.
   A. Addition
   B. Multiplying
   C. Sampling
   D. Addition and multiplication

ii. If x (-t) = -x (t) then the signal is said to be _____
   A. Even signal
   B. Odd signal
   C. Periodic signal
   D. Non periodic signal

iii. The type of systems which are characterized by input and the output quantized at certain levels are called as
   A. analog
   B. discrete
   C. continuous
   D. digital

iv. All real time systems concerned with the concept of causality are
   A. non causal
   B. causal
   C. neither causal nor non causal
   D. memory less

v. The Fourier Transform of a real valued time signal has
   A. Odd symmetry

34

B. Even symmetry
C. Conjugate symmetry
D. Real

vi. The Fourier sine transform of e -ax is
A. a/(s2+a2)
B. s/(s2-a2)
C. s/(s2+a2)
D. a/(s2-a2)

vii. A Discrete signal is said to be even or symmetric if X(-n) is equal to _____
A. X(n)
B. 0
C. –X(n)
D. –X(-n)

viii. What is the steady state value of The DT signal F (t), if it is known that F(s) = 1(s+2)2(s+4)?
A. 116
B. Cannot be determined
C. 0
D. 18

Ix. What is the set of all values of z for which X(z) attains a finite value?
A. Radius of convergence
B. Radius of divergence
C. Feasible solution
D. None of the mentioned

x. Which of the following is used in the realization of a system?
A. Delay elements
B. Multipliers
C. Adders
D. All of the mentioned

Q2) [15]

a. Explain classification of signals. **[7]**

b. Determine the even and odd parts of signal **[8]**
i. X(t) = e^(-t)u(t)
ii. X(t) = r(t)u(t)

Q3) [15]

a. Discuss the properties of system with example. [7]

b. Check whether following system are linear or not [8]
   i. dy/dt + 3ty(t) = t^2x(t)
   ii. y(n) = Ax(n) + B

Q4) [15]

a. Explain the properties of Fourier transform. [7]

b. Develop direct form I and II realization of difference equation. [8]
   Y(n) = b0x(n) + b1x(n-1) + b2x(n-2) b3x(n-3) -a1y(n-1)-a2y(n-2) -a3y(n-3)

Q5) [15]

a. State and explain different properties of DTFT [7]

b. Find 4 point DFT of following x(n) = {-1, 2, 5, 4} [8]

Q6) [15]

a. Explain the properties of region of conversion. [7]

b. Obtain Z transform of following finite durations. [8]
   i. X(n) = {1,2,4,5,0,7}
   ii. X(n) = {1,3,4,2,1,6}

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56537) Signal & System Part 3 SEM 5

QP-10046

Seat No. ELS-5th Sem 36

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Power Electronics

Sub. Code: 56538

Day and Date: Monday ,15-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Special Inst.: Q.1 is compulsory
solve any 4 questions form remaining questions

Q1) Solve following MCQ. [10]

i. The 3 modes of SCR can be represented in _____ forms
   A. On sate
   B. Off-state
   C. Both a and b
   D. Zero stage

ii. Which of the following junctions in SCR forward conduction type mode are forward biased
   A. j1
   B. j3
   C. j2
   D. Both a and b

iii. In the complete firing circuit, the driver circuit consists of
   A. pulse generator & power supply
   B. gate leads & power supply
   C. pulse amplifier & pulse transformer
   D. pulse detector & pulse amplifier

iv. In a single pulse semi-converter using two SCRs, the triggering circuit must produce
   A. Two firing pulses in each half cycle
   B. one firing pulse in each half cycle
   C. three firing pulses in each cycle
   D. one firing pulse in each cycle

v. In single phase fully controlled rectifiers with continuous dc current, the number of thyristors conduct during commutation
   A. One

37

B. two
C. three
D. four

vi. The freewheeling diode is not required in _____ rectifier
A. Controlled
B. Uncontrolled
C. Both a and b
D. None of the above

vii. Which of the following are single phase inverter
A. Half bridge inverter
B. Full bridge inverter
C. 180-degree mode inverter
D. Both a and b

viii. Percentage of the time at which signal is ON is referred to as _____
A. Input Cycle
B. Output Cycle
C. Duty Cycle
D. Incoming Cycle

ix. Which device can be used in a chopper circuit
A. BJT
B. MOSFET
C. GTO
D. All of the mentioned

x. No discontinuity is observed in case of
A. short break static UPS configuration
B. long break static UPS configuration
C. no break static UPS configuration
D. rotating type UPS configuration

Q2) A. Define Commutation. Explain Forced commutation with its types [7]
B. Explain effect of freewheeling diode in detail also justify the statement " freewheeling diode improves the power factor of the system". [8]

Q3) A. Explain in detail morgans chopper with waveforms. [7]
B. What is the difference between half and full bridge inverter. Draw circuit diagram of half bridge inverter and full bridge inverter [8]

Q4) A. Explain with waveforms switched mode power supply. [7]
B. Explain the various modes of TRIAC with the help of equivalent circuits and relevant waveforms. [8]

Q5) A. Explain the operation of single-phase half wave rectifier with R load draw waveforms. [7]

B. Explain DC series and DC shunt motor using chopper. [8]

Q6) A. Explain dynamic characteristics of SCR during turn off. Explain how turn off methods are carried out. [8]

B. Explain the basic requirements for the successful firing of thyristors during one cycle. [7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56538) Power Electronics Part 3 SEM 5

Seat No. ECS-5th Sem 39

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Computer Organization & Architecture

Sub. Code: 56539

Day and Date: Wednesday,17-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: **1. Assume suitable data wherever necessary and mention it boldly**
2. Draw neat labelled diagrams wherever necessary

Special Inst.: **Q.1 is compulsory**
Solve any 4 questions from remaining questions

Q1) Solve following MCQ. **[10]**

i. Which unit is used to measure the CPU's processing power?
A. GIPS

B. LIPS

C. MIPS

D. Nanoseconds

ii. The clock rate of CPU is measured in which unit?
A. Milliseconds

B. Microhertz

C. Nanoseconds

D. MHz or GHz

iii. Central Processing Unit in a computer consists of which major components?
A. Arithmetic logic unit (ALU) and Control Unit

B. Control Unit (CU)

C. Registers

D. ALU, Control Unit, and Registers

iv. Which among the following is the fastest memory in a computer that holds information?

A. Register

B. Cache

C. Main memory

D. RAM

v. Which of the following is a characteristic of primary memory?

A. It is non-volatile

B. It stores data permanently

C. It is directly accessible by the CPU

D. It is slower than secondary memory

vi. ROM (Read-Only Memory) is typically used for:

A. Storing temporary data

B. Permanent storage of firmware

C. Storing frequently used data

D. Fast access to volatile data

vii. Flynn's classification of computer architectures divides them into how many categories?

A. Two

B. Three

C. Four

D. Five

viii. What is the purpose of a Process Control Block (PCB)?

A. To store data for user applications

B. To maintain the status of processes during execution

C. To control memory allocation

D. To manage the CPU's processing unit

ix. A process is in the "Waiting" state when:

A. It is ready to execute but waiting for the CPU

B. It is waiting for a specific event or resource

C. It has been completed and is waiting to be removed

D. It is not scheduled and is suspended

x. Amdahl's Law is used to calculate:

A. The time required for a parallel program to run on multiple processors

B. The maximum speedup achievable with parallel computing

C. The cost-effectiveness of parallel processing

D. The number of processors required for a given task

Q2)	A.	Draw and explain functional unit of computer	[7]
	B.	Define the following a) Clock Rate b) Clock Speed c) Clock Cycle d) CPI	[8]
Q3)	A.	Draw and explain basic control unit of computer system	[7]
	B.	Explain register organization in CPU with the diagram.	[8]
Q4)	A.	Classify the memory of computer system and write a note on RAM	[7]
	B.	Explain memory interleaving in detail with neat diagram	[8]
Q5)	A.	What is process? Explain Process States diagram in detail	[7]
	B.	What is preemptive and non-preemptive scheduling ? Explain FCFS scheduling in detail	[8]
Q6)	A.	What is parallel processing ? Explain Flynn's classification	[7]
	B.	Explain superscalar architecture with neat diagram	[8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.

QP-10292

Seat No. ECS-5th Sem 42

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Computer Network II

Sub. Code: 56540

Day and Date: Friday ,19-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. All questions are compulsory
2. Assume suitable data wherever necessary and mention it boldly
3. Draw neat labelled diagrams wherever necessary
4. Use of Scientific calculator is allowed

Q1) Solve following MCQ. **[10]**

i. **Which socket type provides a reliable, connection-oriented service?**
   A. Datagram socket
   B. Stream socket
   C. Raw socket
   D. Non-blocking socket

ii. **Which API call is used by a server to listen for incoming connections?**
   A. connect()
   B. accept()
   C. listen()
   D. recv()

iii. **IPv6 addresses are of what length?**
   A. 32 bits
   B. 64 bits
   C. 128 bits
   D. 256 bits

iv. **Which header is eliminated in IPv6?**
   A. Version field
   B. Header checksum
   C. Hop Limit
   D. Payload length

v. **DHCP works on which transport protocol?**
   A. TCP
   B. UDP
   C. ICMP
   D. IP

vi. **DNS uses which naming structure?**

A. Flat
B. Centralized
C. Hierarchical
D. Distributed flat

vii. **TELNET uses:**

A. TCP port 23
B. UDP port 69
C. TCP port 21
D. UDP port 23

viii. **FTP uses how many connections?**

A. One
B. Two
C. Three
D. Dynamic

ix. **HTTP is a:**

A. Connection-oriented protocol
B. Connectionless, stateless protocol
C. Stateful protocol
D. Real-time protocol

x. **RTP is mainly used for:**

A. Email
B. Web browsing
C. Real-time audio/video
D. File transfer

Q2) A. Describe client-server model and briefly explain its advantages and disadvantages. [7]

B. Explain Socket Interface along with its different operations. [8]

Q3) A. Describe the structure of an IPv6 packet format. [7]

B. Discuss the transition strategies from IPv4 to IPv6. [8]

Q4) A. Define DNS and explain the concept of DNS in internet. [7]

B. Define TELNET protocol and show how it implements local and remote login using Concept of Network Virtual Terminal (NVT). [8]

Q5) A. Explain the architecture of HTTP. [7]

B. Briefly explain the different types of web documents. [8]

Q6) A. List the different approaches to stream stored audio and video and explain any 2 of them. [7]

B. Explain the characteristics of real time audio/video communication. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56540) Computer Network II Part 3 SEM 5

QP-10489

Seat No. EC S- 5th Sem 45

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Sensors & Applications

Sub. Code: 56541

Day and Date: Friday ,26-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:

Special Inst.:
1) Q.1 is compulsory.
2) Solve any 4 questions from remaining questions.
3) Use non-programmable calculator is permissible.
4) Figures to the right indicate full marks.
5) Assume suitable data, if required.

Q1) Solve following MCQ. Each question carries 1 Mark **[10]**

i. Instrument calibration helps to ensure:
   A. Speed
   B. Accuracy
   C. Color coding
   D. Shape of sensor

ii. Which sensor uses Seeback effect?
   A. Thermistor
   B. RTD
   C. Thermocouple
   D. LM35

iii. Electromagnetic flow meters are suitable for:
   A. Gas only
   B. Conductive liquids
   C. Oil
   D. Air

iv. Nuclear level detection is preferred when:
   A. Low cost is needed
   B. Contactless measurement is essential
   C. Large objects are present
   D. Simple setup is required

v. Which light detector is commonly used in digital cameras?
   A. Photo transistor
   B. Photodiode
   C. CCD
   D. LDR.

46

vi. Gas flame detectors typically respond to:
A. Visible light
B. Infrared or UV
C. Pressure
D. Gas composition

vii. Smart sensors integrate sensing with:
A. Manual input
B. Mechanical rotation
C. Signal processing and communication
D. AC motors

viii. Which sensor uses crystal materials for detecting force or pressure?
A. Hall sensor
B. Piezoelectric sensor
C. Thermistor
D. RTD

ix. Hydraulic actuators use:
A. Compressed air
B. Electricity
C. Pressurized liquid
D. Gas flow

x. Which motor type is best suited for precise position control?
A. AC motor
B. DC motor
C. Stepper motor
D. Induction motor

Q2) Attempt the following questions. **[15]**

a. Define the following key performance metrics: **[8]**
1. Accuracy 2. Precision 3. Resolution 4. Sensitivity

b. With neat block diagram explain instrumentation system. **[7]**

Q3) Attempt the following questions. **[15]**

a. Compare and contrast RTD's, Thermistors and Thermocouples in temperature measurement. **[8]**

b. Explain humidity sensor in detail. **[7]**

Q4) Attempt the following questions. **[15]**

47

a. Write a short note on: [8]
1. Orifice Meter
2. Venturi tube

b. Explain the working principle of Rotameter. [7]

Q5) Attempt the following questions. [15]

a. Differentiate between CCD and CMOS image sensor [8]

b. Explain the working principle of Linear Variable Differential Transducer. [7]

Q6) Attempt the following questions. [15]

a. Explain the working principle of Hall-Effect sensor and their applications. [8]

b. Describe the functions and types of process control valves. [7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56541) Sensors & Applications Part 3 SEM 5

Seat No. ECS - 6th Sem 48

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Digital Signal Processing

Sub. Code: 109676/56544

Day and Date: Friday ,12-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary
3. Use of Scientific calculator is allowed

Special Inst.: Q.1 is compulsory
Solve any four from the remaining

Q1) Solve following MCQ. **[10]**

i. **The DFT assumes the input sequence to be:**
   A. Periodic
   B. Aperiodic
   C. Random
   D. Zero-valued

ii. **The length of circular convolution of two N-point sequences is:**
   A. N
   B. N^2
   C. 2N
   D. N-1

iii. **FIR filters are always**
   A. Stable
   B. Time-varying
   C. Non-causal
   D. Non-linear

iv. **FIR filters have:**
   A. Infinite impulse response
   B. Finite impulse response
   C. No impulse response
   D. Adaptive response only

v. **Which of the following methods for converting an analog filter to a digital filter suffers from aliasing?**
   A. Bilinear transformation
   B. Impulse invariance method
   C. Matched-Z transform

D. Direct substitution

vi. **The bilinear transformation maps the entire analog jΩ axis to:**
- A. The unit circle in the Z-plane
- B. Inside the unit circle
- C. Outside the unit circle
- D. The real axis of Z-plane

vii. **Which of the following structures is commonly used for FIR filter realization?**
- A. Direct Form I
- B. Direct Form II
- C. Lattice structure
- D. State-space form

viii. **Cascade realization of IIR filters is generally used to:**
- A. Reduce the sampling rate
- B. Improve numerical stability
- C. Increase filter order
- D. Reduce computation

ix. **Decimation by a factor D involves:**
- A. Increasing sample rate by D
- B. Decreasing sample rate by D
- C. Filtering without sampling
- D. Windowing the signal

x. **A major limitation of the Fourier Transform is:**
- A. Poor frequency resolution
- B. No time-localization
- C. Excessive noise sensitivity
- D. Requires continuous signals

Q2) A. **Explain the computational complexity of Discrete Fourier Transform (DFT). Why is Fast Fourier Transform (FFT) preferred over DFT in practical applications?** [8]

B. **Compute the DFT of $x(n) = \cos\left(\frac{n\pi}{2}\right)$, where N=4 using DIF-FFT Algorithm** [7]

Q3) A. List and explain different types of FIR filters? [7]

B.

[8]

Design an Ideal High Pass Filter with frequency response

$$H_d(e^{j\omega}) = \begin{cases} 1 & for \ \frac{-\pi}{4} \le |\omega| \le \pi \\ 0 & for \ |\omega| \le \frac{\pi}{4} \end{cases}$$

Find the value of $h(n)$ for N=11 and H(Z)

Q4) A. List and explain different approximations of analog filter. [7]

B. [8]

Design an analog Chebyshev filter for given specifications

$$\begin{cases} \frac{1}{\sqrt{2}} \le |H(j(\omega)| \le 1 & for \ 0 \le \Omega \le 2 \\ |H(j(\omega)| \le 0.1 & for \ \Omega \ge 4 \end{cases}$$

Q5) A. Explain the architecture of TMS3200C67XX DSP Processor with a neat block diagram and explain its functional units. [7]

B. Obtain the Parallel form realization of given transfer function. [8]

$$H(Z) = \left(\frac{1.625Z}{(Z+0.3)} - \frac{0.625Z}{(Z+0.5)}\right).$$

Q6) A. Consider the discrete time signal $x(n) = \{1,2,3,4,5,6,7,8,9,10,11,12\}$ determine the decimated version of the signal for sampling rate reduction factor [8]

i) D=2

ii) D=3

iii) D=4

B. Explain the need for multirate DSP. [7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56544) Digital Signal Processing Part 3 SEM 6

Seat No. ECS 6th Sem 51

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: PLC & Automation

Sub. Code: 109677/56545

Day and Date: Saturday ,13-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly

Special Inst.: 1) Q.1 is compulsory.
2) Solve any 4 questions from remaining questions.
3) Use non-programmable calculator is permissible.
4) Figures to the right indicate full marks.
5) Assume suitable data, if required.

Q1) Solve following MCQ. Each question carries 1 Marks **[10]**

i. Proper grounding is essential to avoid:
   A. Data loss
   B. Noise interference
   C. Overvoltage
   D. All of the above

ii. On/Off control is also called:
   A. Proportional
   B. Bang-bang
   C. Integral
   D. Digital

iii. RS-232 is a _____ communication.
   A. Serial
   B. Parallel
   C. Wireless
   D. Optical

iv. Industrial network advantage:
   A. Reduces wiring
   B. Fast communication
   C. Easy diagnostics
   D. All of the above

v. Profibus-PA is used in
   A. Discrete automation
   B. Process automation
   C. Office automation
   D. Robotics only

52

vi. Among the following which one is PLC programming language
A. Ladder
B. Assembly
C. HTML
D. JAVA

vii. Programming line known as ------uses as ladder logic for PLC
A. Rung
B. Right
C. Logic
D. Wrong

viii. In PLC scan time refers to time in which
A. Technician enters program.
B. One rung ladder logic takes to complete
C. Timer and counters initiated
D. Entire program take to execute

ix. An OR function implementation is ladder logic
A. NC contact in series
B. NO contact in series
C. NO contacts in parallel
D. NC contact in parallel

x. To protect PLC from any incoming surges from the field isolated device such as ----is used
A. opt isolator
B. Transducer
C. ADC
D. DAC

Q2) Attempt the following questions. **[15]**

a. Describe the principle of operation of a PLC. Explain the PLC scan cycle in detail **[7]**

b. Explain different output control devices used in PLC-based automation. **[8]**

Q3) Attempt the following questions. **[15]**

a. Discuss the development of Relay logic ladder diagram. **[7]**

b. Explain logical instruction with ladder diagram. **[8]**

Q4) Attempt the following questions. **[15]**

a. Explain environmental considerations during PLC installation. [7]

b. Describe ON/OFF control and its applications. [8]

Q5) Attempt the following questions. [15]

a. Explain applications of SCADA. [7]

b. Explain steps of troubleshooting in PLC. [8]

Q6) Attempt the following questions. [15]

a. Explain different types of networking channels used in industries. [7]

b. Explain SCADA system with block diagram. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56545) PLC & Automation Part 3 SEM 6

QP-10307

Seat No. ECS- 6th Sem 54

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Internet of Things(ECS)

Sub. Code: 56550

Day and Date: Thursday ,18-12-2025 **Total Marks: 70**

Time: 10:30 AM To 01:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary

Special Inst.: Q.1 is compulsory.
Solve any 4 questions from remaining questions

Q1) Solve following MCQ. **[10]**

i. Which is a major concern related to IoT security?
- A. Device design
- B. Power supply
- C. Unauthorized access to personal data
- D. Data redundancy

ii. What is the default operating system for Raspberry Pi?
- A. Windows
- B. Raspbian (Raspberry Pi OS)
- C. Android
- D. Ubuntu

iii. Which of following is a limitation of barcode over RFID system?
- A. Object can't be detected from far range
- B. Wired connection is needed to detect the object
- C. Object and scanner should be in a line of side
- D. Scanner require more power

iv. Which of the following languages can be used to program a Raspberry Pi?
- A. C
- B. C++
- C. Python
- D. All of the above

v. Following are examples of PANs (Personal Area Networks)
- A. ZigBee
- B. Bluetooth (BLE)
- C. NFC
- D. All of the above

vi. Bluetooth operates in ___ ISM band and has a bandwidth approximately___.
- A. 2.4 MHz, 100 Mbps
- B. 2.4 GHz, 1-3 Mbps
- C. 1.4 GHz, 1000Mbps
- D. 2.4 KHz, 100 Mbps

vii. In IoT, Smart Metering is primarily used for:
- A. Predicting weather conditions
- B. Measuring and reporting utility consumption automatically
- C. Managing hospital patient records
- D. Autonomous driving

viii. Which Raspberry Pi port is used to plug into monitor or modern television?
- A. Ethernet port
- B. HDMI port
- C. Micro USB power port
- D. None of the above

ix. What frequency band is typically used by IEEE 802.11 WLAN (Wi-Fi)?
- A. 2.4 GHz and 5 GHz
- B. 900 MHz
- C. 60 GHz
- D. 3.5 GHz

x. A radio transceiver in WSN (node) contains which component internally?
- A. Antenna
- B. Wire
- C. Electrode
- D. None of the above

Q2)

a. What is IOT? With neat diagram explain IoT frame works [8]

b. Explain in brief "Internet in the IOT". [7]

Q3)

a. Write Short notes on: [7]
i) Communication in Wireless sensor network
ii) Principle of RFID

b. With the help of neat diagram explain RFID middleware [8]

Q4)

a. Write a short note on: [7]

i) Bluetooth
ii) NFC
iii) IEEE 802.15.6

b. Explain in detail Cellular and Mobile Network Technologies. [8]

Q5)

a. With neat diagram explain universal mobile telecommunication system [8]

b. Write and explain a simple program with C language for an application using IoT [7]

Q6)

a. Write the different applications of IoT in home automation, explain briefly. [7]

b. List and explain any two Automotive Applications based on IoT. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (56550) Internet of Things(ECS) Part 3 SEM 6

Seat No. ECS-7th-Sem 57

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Cloud Computing

Sub. Code: 113053

Day and Date: Wednesday,10-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: **1. Assume suitable data wherever necessary and mention it boldly**
2. Draw neat labelled diagrams wherever necessary

Special Inst.: **Q.1 is compulsory.**
Solve any 4 questions from remaining questions.

Q1) Solve following MCQ. **[10]**

i. Which of the following is the primary goal of cloud computing?
- A. Increase hardware cost
- B. Provide scalable resources
- C. Reduce network speed
- D. Increase complexity

ii. Distributed computing focuses on:
- A. Using a single processor
- B. Sharing resources across multiple systems
- C. Running programs offline
- D. Local memory optimization

iii. Parallel computing typically uses:
- A. Multiple processors
- B. One processor
- C. One thread
- D. One memory block

iv. Building a cloud environment requires:
- A. Virtualization
- B. Physical-only servers
- C. Hardware redundancy only
- D. Manual resource handling

v. Which is a parallel computing model?
- A. SISD
- B. MISD
- C. SIMD
- D. All

vi. Which is NOT a characteristic of distributed systems?
- A. Scalability
- B. Transparency
- C. Autonomy
- D. Manual scheduling

vii. Cloud computing is based on:
- A. Grid computing
- B. Distributed computing
- C. Parallel computing
- D. All

viii. Cloud computing architecture is built on top of:
- A. Virtualization
- B. Spreadsheets
- C. Local storage
- D. Telecommunication

ix. The main purpose of parallel computing is to:
- A. Increase energy consumption
- B. Reduce execution time
- C. Remove multitasking
- D. Slow down processes

x. Cloud computing follows a _____ model.
- A. Pay-per-use
- B. Subscription-free
- C. One-time purchase
- D. Offline

Q2)

a. Describe the process of building a cloud computing environment with suitable components. [7]

b. Explain the concept of virtualization with a neat diagram. [8]

Q3)

a. Explain the different types of clouds and discuss the concept of economic clouds. [7]

b. Explain scientific applications of cloud computing in the healthcare sector. [8]

Q4)

a. Explain the architecture of cloud computing with a labelled diagram. [7]

59

b. Explain market-based management techniques used in cloud environments. [8]

Q5)

a. Explain the concept of a security boundary and security service boundary in cloud computing. [7]

b. Explain establishing identity and presence in cloud systems and describe identity protocol standards. [8]

Q6)

a. Explain the role and importance of third-party cloud services. [7]

b. Explain security mapping and security data. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (113053) Cloud Computing Part 4 SEM 7

Seat No. ECS-7th Sem 60

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: VLSI Design

Sub. Code: 113049

Day and Date: Saturday ,13-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions: 1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary

Special Inst.: 1st question is compulsory.
solve any 4 questions from remaining questions

Q1) Solve following MCQ. **[10]**

i. **Which one of the following is not a universal gate?**
   A. EX-NOR
   B. NAND
   C. NOR
   D. None of the above

ii. **How many inputs does a full adder logic circuit will have?**
   A. 1
   B. 2
   C. 3
   D. 4

iii. **What are the advantages of static RAM?**
   A. High-speed
   B. High power consumption
   C. Low density and capacity
   D. All of the above

iv. **Which one of the following is a VHDL logical (Boolean) operator?**
   A. Equality
   B. Inequality
   C. Less than
   D. Not

v. **In which one of the following, the user defined data types are allowed?**
   A. VHDL
   B. Verilog
   C. Both a and b
   D. None of the above

vi. **In combinational circuits output depends on----------**
- A. Previous output
- B. Present inputs
- C. Previous inputs
- D. Both a & b

vii. **The multiplexer is also known as----------**
- A. Data selector
- B. Parity checker
- C. Data driver
- D. All of these

viii. **What is the standard form of PLA?**
- A. Programmable Logic Array
- B. Programmable Local Array
- C. Programmable Load Array
- D. None of the above

ix. **What is the standard form of FPGA?**
- A. Float Programmable Gate Array
- B. First Programmable Gate Array
- C. Field Programmable Gate Array
- D. None of the above

x. **How many flip-flops are required in a four-bit up-down counter?**
- A. One
- B. Ten
- C. Three
- D. Four

Q2) Solve following questions

a. Apply QUINE-McCLUSKY method to reduce the expression f= $\sum m(0,1,6,7,8,9,13,14,15)$ [8]

b. Make use of K-map and Reduce Expression $F=\sum m(0,1,4,5,6,7,9,11,15)+d(10,14)$ [7]

Q3)

a. Draw and explain Full adder using VHDL Behavioral model.(use if statement) [8]

b. Develop 1:8 D-Mux using VHDL programming(use case statement) [7]

Q4) Solve following qustions

a. Compare VHDL and Verilog. [7]

b. Explain in detail modeling styles of VHDL program with example. [8]

Q5) Solve following questions

a. Design logical diagram of 1011 sequence using mealy machine non-overlapping. [7]

b. Write VHDL program for synchronous 4 bit down counter. [8]

Q6)

a. Describe in detail DRAM [7]

b. Describe in detail SRAM. Draw 6T transister diagram. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (113049) VLSI Design Part 4 SEM 7

63

QP-10264

Seat No. ECS-7th-Sem

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Machine Learning using Python

Sub. Code: 113050

Day and Date: Thursday ,18-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Special Inst.:
1. Question number 1 is compulsory.
2. Solve any 4 questions from remaining questions.

Q1) Solve following MCQ. **[10]**

i. 1. Which of the following best describes overfitting in a machine learning model?
   A. The model performs well on training and test data
   B. The model performs poorly on training data but well on test data
   C. The model performs well on training data but poorly on unseen data
   D. The model has a high bias and low variance

ii. In linear regression, the goal of gradient descent is to:
   A. Maximize the cost function
   B. Minimize the cost function
   C. Compute the accuracy
   D. Select the best features

iii. What is the purpose of feature scaling in multivariate linear regression?
   A. To convert all features to categorical form
   B. To reduce the number of training samples
   C. To speed up gradient descent convergence
   D. To eliminate irrelevant features

iv. Logistic regression uses which of the following activation functions?
   A. ReLU
   B. Softmax
   C. Sigmoid
   D. Tanh

v. Which of the following is NOT true about decision trees?
   A. They are prone to overfitting
   B. They can handle both regression and classification
   C. They are always more accurate than random forests

D. They do not require feature scaling

vi. The Naïve Bayes classifier assumes:
A. Features are linearly separable
B. Features are dependent on each other
C. Features are conditionally independent
D. Data follows a uniform distribution

vii. Which of the following explains the kernel trick in SVM?
A. Reducing the number of support vectors
B. Transforming data into a higher-dimensional space
C. Minimizing cost using gradient descent
D. Choosing the best decision tree

viii. K-Means clustering attempts to minimize:
A. Entropy of clusters
B. Sum of squared distances between points and their centroids
C. Gini impurity
D. Log-likelihood of cluster membership

ix. In neural networks, backpropagation is used to:
A. Initialize weights
B. Compute accuracy
C. Update weights by propagating errors backward
D. Convert regression to classification

x. Which of the following is an advantage of Random Forest over a single Decision Tree?
A. Requires more training data
B. Has higher variance
C. Is less interpretable but usually more accurate
D. Works only for classification tasks

Q2)

a. Explain the machine learning Architecture with neat diagram. [8]

b. List and explain Machine Learning process [7]

Q3)

a. Explain multiple linear regression with example [8]

b. Explain decision tree, with anyone algorithm of decision tree. [7]

Q4)

65

a. Explain the following [8]
a.Bayesian Network b.Hidden Markov model.

b. Explain Random Forest algorithm with Example [7]

Q5)

a. Write a short note on following [8]
a.Supervised Learning b.Unsupervised Learning

b. What is association rule mining explain with example. [7]

Q6)

a. Explain Artificial Neural Networks. [8]
Explain following terms A.Neuron structure B.Activation functions C.Cost function.

b. Explain Hidden Markov Models. Compare their structure and usage. [7]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (113050) Machine Learning using Python Part 4 SEM 7

Seat No. ECS - 7th Sem 66

QP-9247

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Digital Image Processing

Sub. Code: 113051

Day and Date: Friday ,05-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:
1. Assume suitable data wherever necessary and mention it boldly
2. Draw neat labelled diagrams wherever necessary
3. Figures to the right indicate full marks
4. Use of Scientific calculator is allowed

Special Inst.:
1) Que. 1 is compulsory
2) Solve any FOUR questions from remaining questions

Q1) Solve following MCQ. **[10]**

I. Which step in image processing involves converting an analog image into a digital form?
- A. Image acquisition
- B. Image enhancement
- C. Image restoration
- D. Image segmentation

II. A grayscale image uses how many values to represent each pixel?
- A. Three (R, G, B)
- B. One intensity value
- C. Two values (Magnitude and Phase)
- D. Four values (CMYK)

iii. Pseudo color image processing assigns colors based on:
- A. Neighboring pixel values
- B. Intensity levels
- C. Edge information
- D. Noise model

iv. Which noise model is commonly modeled using Gaussian distribution?
- A. Salt-and-pepper noise
- B. Gaussian noise
- C. Speckle noise
- D. Impulse noise

v. Which filtering is suitable for linear noise and blur removal?
- A. Median filter
- B. Inverse filter
- C. Morphological filter

D. Bilateral filter

vi. LZW coding is a:
A. Transform-based compression
B. Dictionary-based compression
C. Run-length coding
D. Predictive coding

vii. Edge detection is based on:
A. Identifying intensity discontinuities
B. Color analysis
C. Histogram equalization
D. Noise removal

viii. Region growing is a segmentation technique based on:
A. Edge detection
B. Starting from seed points and including similar neighbors
C. Histogram equalization
D. Noise filtering

ix. In biometric pattern recognition, which modality is NOT common?
A. Fingerprint
B. Face
C. Signature
D. Sound waves

x. Which technique is often used in face recognition to reduce the dimension of data?
A. Kernel Principal Component Analysis (KPCA)
B. Independent Component Analysis (ICA)
C. Principal Component Analysis (PCA)
D. Non-negative Matrix Factorization (NMF)

Q2) Answer the following questions. **[15]**

a. Briefly explain the components involved in Digital Image Processing. **[8]**

b. Explain the concept of color image and its applications in digital image processing. **[7]**

Q3) Answer the following questions. **[15]**

a. Describe the basic gray level transformation methods in digital image processing. **[8]**

b. Perform histogram equalization of the given 5x5 image **[7]**

$$\text{Image} = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 1 & 1 & 1 & 1 & 1 \end{bmatrix}$$

Q4) Answer the following questions. **[15]**

a. Define noise. List different noise models and explain any 3 of them. **[8]**

b. Explain various methods involved in region-based segmentation. **[7]**

Q5) Answer the following questions. **[15]**

a. With a neat block diagram explain decoder model of JPEG compression standard. **[8]**

b. Find the Huffman code of the given 8-bit image: **[7]**

$$\text{Image} = \begin{bmatrix} 7 & 7 & 3 & 1 & 1 \\ 6 & 2 & 3 & 1 & 1 \\ 4 & 3 & 0 & 0 & 7 \\ 3 & 4 & 3 & 3 & 4 \\ 5 & 5 & 6 & 2 & 2 \end{bmatrix}$$

Q6) Answer the following questions. **[15]**

a. Explain the characteristics and challenges involved in biometric recognition system **[8]**

b. Write a detailed case study of face recognition in image processing. **[7]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (113051) Digital Image Processing Part 4 SEM 7

Seat No. ECS-7th Sem 69

QP-9598

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

1154 B.Tech. CBCS

Sub. Name: Video Engineering

Sub. Code: 113052

Day and Date: Monday ,08-12-2025 **Total Marks: 70**

Time: 02:30 PM To 05:00 PM

Instructions:

Special Inst.:
1) Q.1 is compulsory.
2) Solve any 4 questions from remaining questions.
3) Use non-programmable calculator is permissible.
4) Figures to the right indicate full marks.
5) Assume suitable data, if required.

Q1) Solve following MCQ. Each question carries 01 Marks **[10]**

i. The standard aspect ratio of a television raster is
   A. 2:1
   B. 4:3
   C. 3:2
   D. 3:4

ii. Absence of one colour in a colour picture indicates
   A. shorting of one of the guns in picture
   B. defect in colour video amp
   C. either (a) or (b)
   D. none of the above

iii. VSB modulation is preferred in TV because
   A. it reduces the bandwidth requirement to half
   B. it avoids phase distortion at low frequencies
   C. it results in better reception
   D. none of the above

iv. Interlace Scanning always takes place in direction of
   A. Left to right, Top to bottom
   B. Left to right, bottom to top
   C. Right to left, top to bottom
   D. None of above

v. To have perfect retrace in the receiver .....Signal is used
   A. sync
   B. chroma
   C. luminance

D. Blanking

vi. What is the bit rate for high- definition TV (HDTV)?
A. 4 Gbps
B. 2 Gbps
C. 1.5 Gbps
D. 1.8 Gbps

vii. How much time elapses between the start of one horizontal sync pulse and the next?
A. 10.2 μs
B. 63.5 μs
C. 16.67 μs
D. 100 μs

viii. A color burst consists of at least
A. 8 cycles of 4.5 MHz
B. 60 cycles of 45.75 MHz
C. 8 cycles of 3.579545 MHz
D. 60 cycles of 15,750 Hz

ix. In TV receiver if vertical sync is missing, the picture will
A. roll up and down
B. roll horizontally
C. roll up and down as well as horizontally
D. not be distorted

x. White minus-blue colour means
A. Orange
B. Magneta
C. Yellow
D. green

Q2) Attempt the following Questions. [15]

a. Describe interlace scanning in brief. How interlace scanning help to reduce bandwidth of video signal? [7]

b. Compare NTSC, PAL and SECAM system . [8]

Q3) Attempt the following Questions. [15]

a. Draw and explain complete block diagram of PAL decoder [7]

b. Explain Positve & Negative modulation. [8]

Q4) Attempt the following Questions. [15]

71

a. Discuss the digital TV video parameters? [8]

b. Describe the working of LNBC with the help of block diagram. [7]

Q5) Attempt the following Questions. [15]

a. Discuss Merits of Digital Television technology. [8]

b. Describe the construction & working of LED TV. [7]

Q6) Attempt the following Questions. [15]

a. With suitable block diagram explain DTH receiver. [7]

b. Draw and explain a functional block diagram of digital color TV receiver. [8]

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (1154) B.Tech. CBCS (113052) Video Engineering Part 4 SEM 7