

Total No. of Questions : 8]

SEAT No. :

P7603

[6180]-122

[Total No. of Pages : 2

T.E. (Electronics and Computer Engineering)
DATABASE MANAGEMENT SYSTEM
(2019 Pattern) (Semester - I) (310341)

Time : 2½ Hours

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right side indicate full marks.
- 3) Assume suitable data, if necessary.

- Q1)** a) Explain the various clauses for SELECT Query with example. [6]
b) Write a short note Aggregate Functions. [6]
c) Explain stored procedure and stored function. Differentiate between stored procedure and stored function. [8]

OR

- Q2)** a) Explain pattern matching operator “LIKE” [6]
b) Explain any two join operation with example. [6]
c) Define Views. Explain Create, Update and Delete Views with examples.[8]

- Q3)** a) What is serializability? Explain conflict serializability and view serializability with example. [8]
b) Explain in detail ACID properties of transactions. [8]

OR

- Q4)** a) What is a deadlock? Explain how deadlock detection and prevention is done. [8]
b) Explain the need of a concurrency control system? How is it achieved with timestamp based protocol? [8]

P.T.O.

- Q5)** a) Explain two important issues Speed Up and Scale Up in case of parallel databases. [8]
b) Define a distributed database. Explain advantages and disadvantages of distributed database. [8]

OR

- Q6)** a) Enlist different Parallel database architectures. Explain any two in detail.[8]
b) Describe concurrency control in distributed databases. [8]

- Q7)** a) Explain MapReduce operation in MongoDB with suitable example. [6]
b) Explain ACID VS BASE properties. [6]
c) List difference between RDBMS and No SQL. [6]

OR

- Q8)** a) Explain any three aggregation functions using MongoDB with suitable example. [6]
b) List different NO SQL data Models and explain Document Based Data Model. [6]
c) Explain CREATE, READ and UPDATE in MongoDB with examples.[6]



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SEAT No. :

P7604

[Total No. of Pages : 3

[6180]-123

T.E. (Electronics and Computer Engineering)

ADVANCED JAVA PROGRAMMING

(2019 Pattern) (Semester-I) (310342)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume Suitable data if necessary.

Q1) a) Explain the following methods for an applet [6]

- i) init()
- ii) destroy()
- iii) Paint()

b) Explain the following AWT/swing components [6]

- i) JTextField
- ii) JFrame
- iii) JSplitPane

c) Write a program to create an applet with some background color and foreground color with a message. The message string is stored in msg and is to be displayed in paint() method. [6]

OR

Q2) a) Explain the following. [6]

- i) adapter classes
- ii) inner classes

b) Write a program to pass name and salary to an applet and get the tax calculated. Make use of get Parameter() method. [6]

c) Write a program to create a combo box with names of some countries. The user can select any one of them from the list and the selected country name is displayed again in the frame. [6]

P.T.O.

- Q3)** a) What are AWT components? Explain some AWT components. [6]
b) Write a program to trap a key which is pressed on the keyboard and display its name in the TextField. (Consider F1, F2, F3 keys). [6]
c) Write a Java program to create a text area and display the mouse event when the button on the mouse is clicked. [6]

OR

- Q4)** a) Write a short note on. [6]
i) Event Classes
ii) Event Listeners
b) Write a program which first creates a frame and then closes it on clicking the close button. [6]
c) Write a Java program that allows you to fill the shapes with some colors. [6]

- Q5)** a) Write short notes on the following. [8]
i) Border Layout
ii) Grid Layout
b) Write a Java program to create a card layout and display 3 buttons, Button1, Button2 & Button3 in card Layout. [8]

OR

- Q6)** a) Write a Graphical User Interface program in Java to create a choice menu with names of some languages from where the user has to select any one item. The selected item must also be displayed in the frame. [8]
b) Explain in detail java utilities package. [8]

- Q7)** a) Explain the following in JDBC [10]
i) DSN
ii) ScrollableResultSet
iii) BLOB
iv) PreparedStatement
v) ODBC

b) Explain the following in relation to JDBC [8]

i) Class. for Name (dname) method

ii) Driver Manager.get Connection

(“jdbc:oracle:thin:@localhost:1521:xe”, “scott”, “tiger”);

OR

Q8) a) Write a JDBC program to retrieve data from the table emptab of test database. [8]

b) Explain in brief the following. [10]

i) ResultSetMetaData

ii) Reader

iii) Type 4 (JDBC driver)

iv) execute () Method

v) getProperty ()



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SEAT No. :

P7605

[6180]-124

[Total No. of Pages : 3

**T.E. (Electronics and Computer Engineering)
DATA COMMUNICATION
(2019 Pattern) (Semester - I) (310343)**

Time : 2½ Hours

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.
- 5) Use of Calculator is allowed.

- Q1)** a) Explain QPSK signal generation with neat block diagram. [6]
- b) With the help of block diagram and waveforms, explain generation of coherent BFSK. [6]
- c) It is required to transmit 2.08×10^6 binary digit per second with $P_b \leq 10^{-6}$. Two possible schemes are considered. [8]
- i) BPSK
 - ii) 16-Ary PSK

The channel noise PSD is $S_n(\omega) = 10^{-8}$. Determine the transmission bandwidth and the signal to power required at receiver input in each case. Given : $\text{erf}(0.99999) = 3.3$

OR

- Q2)** a) Compare the performance of modulation schemes, BPSK, BFSK, QPSK, DPSK, M-ary PSK, M-ary FSK w.r.t. [6]
- i) Variable characteristics in o/p carrier.
 - ii) BW.
 - iii) Symbol duration
 - iv) Probability of Error.
 - v) Bit per symbols.
 - vi) Applications

P.T.O.

- b) Explain generation, Detection of BPSK system with neat block diagram. [6]
- c) Binary data is transmitted using M-ary PSK at a rate 2 Mbps over RF link having bandwidth 2MHz find signal power required at the receiver input so that bit error probability is less than 10^{-5} . [8]

Given: M = 16 and M=32 and Noise PSD $\frac{No}{2} = 10^{-8}$ Watt / Hz, erf (0.99995) = 3.2.

- Q3)** a) Explain different Multiple Access Techniques in detail. [8]
- b) A PN sequence is generated using feedback shift registers of length m=4, Find the generated output sequence if the initial contents of the shift register are 1000. If the chip rate is 10^7 chips/sec. Find the following Parameter [8]
- i) Design PN sequence
 - ii) Chip Duration
 - iii) Length of PN sequence
 - iv) Duration of PN Sequence

OR

- Q4)** a) Draw the block diagram of DSSS BPSK transmitter and receiver system and explain various blocks. [8]
- b) Differentiate between DHSS and FHSS w.r.t. [8]
- i) Definition
 - ii) Chip rate
 - iii) Modulation techniques
 - iv) Processing gain
 - v) Error probability
 - vi) Acquisition time
 - vii) Effect of distance
 - viii) Applications

- Q5)** a) State & Explain [8]
- i) Shannon's channel coding theorem
 - ii) Shannon's Information capacity theorem
- b) Define information rate, Entropy, Mutual information and channel capacity. [8]

OR

- Q6)** a) Compare Shannon - Fano - and Huffman coding techniques. [8]
 b) A source emits 1000 symbols per second from a range of 5 symbols, with probabilities. [8]

$\left\{ \frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \frac{1}{16} \right\} \frac{1}{16}$ find source entropy and information rate.

- Q7)** a) What is stop - and - wait ARQ? Explain. [6]
 b) Explain the need of Error detection and Error Correction. [6]
 c) Define systematic, non-systematic code and Explain properties of linear block code [6]

OR

- Q8)** a) Define the following: [6]
 i) Code rate
 ii) Word length
 iii) Hamming distance
 iv) Minimum hamming distance
 v) Block length
 vi) Constraint length
 b) For a systematic LBC, the parity check bits are [6]

$$C_1 = M_1 \oplus M_2 \oplus M_3$$

$$C_2 = M_2 \oplus M_3 \oplus M_4$$

$$C_3 = M_1 \oplus M_2 \oplus M_4$$

Find

- i) Generator matrix.
 - ii) Error detecting & correcting capabilities.
 - iii) Parity Check Matrix.
 - iv) Corrected code word for received code word [1101001].
- c) Comment whether following code is perfect code or not, with necessary justification. [6]
- i) (7, 4) LBC
 - ii) (6,3) LBC



Total No. of Questions : 8]

SEAT No. :

P7606

[Total No. of Pages : 2

[6180]-125

T.E. (Electronics and Computer Engineering)
MICROCONTROLLER AND APPLICATIONS
(2019 Pattern) (Semester-I) (310344)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Assume Suitable data if necessary.

Q1) a) Interface relay with 8051 microcontroller. Write an embedded C program to turn ON and OFF relay with delay. [6]

b) Draw an interfacing diagram of stepper motor with 8051 microcontroller and write an embedded C code to rotate it in clockwise continuously. [6]

c) Draw an interfacing diagram of DAC with 8051 microcontroller and write an embedded C code to triangular waveforms. [8]

OR

Q2) a) Draw an interfacing diagram of opto-isolator with 8051 microcontroller and write an embedded C code to flash lamp connected to it with delay of 10 msec. [6]

b) Interface buzzer with 8051 microcontroller. Write an Embedded C program to turn ON and OFF buzzer. [6]

c) Explain the interfacing of RS232 with 8051 with neat diagram. Also highlight the role of MAX232 [8]

Q3) a) State any 4 differences between MSP430x2x, MSP430x4x, MSP430x5x. [8]

b) Explain with neat diagram MSP430x5xx microcontroller architecture. [8]

OR

Q4) a) Compare variants of the MSP430 family. [8]

b) Explain in detail register set used in MSP430 microcontroller [8]

P.T.O.

- Q5)** a) Explain the following GPIO registers of MSP430 microcontroller. [8]
- i) PxIES
 - ii) PxREN
 - iii) PxOUT
 - iv) PxDIR
- b) Draw an interfacing diagram of 8 LEDs with MSP430 microcontroller and write an embedded C code to flash the LEDs with is delay. [8]

OR

- Q6)** a) Write a short note on 12C and UART protocol of MSP430 microcontroller. [8]
- b) Explain in detail PWM generation with various duty cycle in MSP430x5xx [8]

- Q7)** a) Design frequency counter using 8051 microcontroller and display the result on LCD. [6]
- b) Design a home automation system using MSP430 microcontroller. Also write an embedded C program for same. [6]
- c) Draw and explain block diagram of DAS using 8051 microcontroller. [6]

OR

- Q8)** a) Design environment monitoring system using MSP430 microcontroller. [6]
- b) Design soil monitoring system for agriculture using MSP430 microcontroller. [6]
- c) Design a water level monitoring system using 8051 microcontroller. Draw the flow chart for the same. [6]



Total No. of Questions : 8]

SEAT No. :

P7607

[6180] - 126

[Total No. of Pages : 2

T.E. (Electronics & Computer Engineering)

DISTRIBUTED SYSTEMS

(2019 Pattern) (Semester - I) (Elective - I) (310345 A)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right side indicate full marks.
- 3) Assume suitable data if necessary.

- Q1)** a) What are the features of P2P system? What are the advantages and disadvantages of P2P system? [6]
b) Write short notes on Napster and Peer to Peer Middleware. [6]
c) Explain the following in details. [8]
i) File system access model and its sharing semantics.
ii) Lightweight Directory Access Protocol

OR

- Q2)** a) Briefly discuss the architecture and server operation of NFS. [6]
b) Explain file service architecture and Andrew file system with suitable sketch. [6]
c) What is Identifiers? Explain the Uniform Resource Identifiers, Uniform Resource Locator and Uniform Resource Names. [8]

- Q3)** a) Explain Logical time, logical clocks and vector clock. Explain the different ways of synchronizing physical clocks. [8]
b) What is a deadlock in distributed system? Explain with example. How deadlock can be recovered? [8]

OR

- Q4)** a) What is mutual exclusion? Explain need of mutual exclusion. Explain how mutual exclusion is handled in distributed system. [8]
b) Describe the internal and external synchronization of Physical clocks. [8]

P.T.O.

- Q5)** a) Explain Task Assignment Approach. Discuss Load-balancing Approach. Explain Load-sharing Approach. [8]
- b) What is meant by scheduling process of a distributed system? Give the techniques and methodologies for scheduling process of a distributed system. [8]

OR

- Q6)** a) What is process migration? State the issues in process migration. Describe negotiation in migration process with neat sketch. [8]
- b) Explain the following. [8]
- i) Address space transport mechanisms.
 - ii) Messages Forwarding.
 - iii) Origin site mechanism.
 - iv) Link traversal mechanism.

- Q7)** a) Explain design overview of Coda distributed file system. Which method is used for communication in Coda file system? Explain. [6]
- b) What do you mean by Google file system? Explain Read and Write process in Google File System. [6]
- c) What is distributed file system? State the advantages and disadvantages of Distributed File System. [6]

OR

- Q8)** a) What is Network File System (NFS) of distributed file system? State the advantages and disadvantages of Network File System (NFS). [6]
- b) With the help of neat diagram explain structure of distributed file system. [6]
- c) State the features of Google file system. State the advantages and disadvantages of Google file system. [6]



Total No. of Questions : 8]

SEAT No. :

P7608

[6180] - 127

[Total No. of Pages : 2

T.E. (Electronics & Computer Engineering)

BLOCKCHAIN TECHNOLOGY

(2019 Pattern) (Semester - I) (Elective - I) (310345 B)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2; Q3 or Q4; Q5 or Q6; Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary

- Q1)** a) What is hash in cryptography? Explain Hash function. [6]
b) What is hashing in blockchain? Write any four characteristics of hashing. [6]
c) What is secure hash algorithm. Explain application of hash algorithm. [6]

OR

- Q2)** a) What is Message Authentication Code (MAC)? Describe process of MAC for authentication. [6]
b) What is solidity programming in ethereum? Write the other programming languages used for ethereum. [6]
c) What is cryptography primitives in blockchain. Explain its importance. [6]

- Q3)** a) What is ethereum? How ethereum facilitates decentralization of applications. [6]
b) What is ethereum virtual machine? Explain its working. [6]
c) Explain Ethereum lanuages, census approach & algorithm. [6]

OR

- Q4)** a) What is ethereum wallet? Explain its types. [6]
b) What is distributed hash table? What are the features of hash distribution. [6]
c) Explain Secure Hash Algorithm Version 1 in detail. [6]

P.T.O.

- Q5)** a) Explain bitcoin transaction format in detail. [6]
b) Draw and explain Merkel tree Bitcoin building block structure. [6]
c) Draw and explain Bitcoin block structure. [6]

OR

- Q6)** a) What is Merkle Trees in blockchain technology? How it works? Explain significance of Merkle Tree. [6]
b) Describe Bitcoin Network in detail. [6]
c) What is bitcoin client? How it offers security in Bitcoin Transactions. [6]

- Q7** a) What is the role of blockchain in cloud computing? Explain with application. [5]
b) Explain the terms Bitcoin Address, Bitcoin Transactions, Bitcoin Network [5]
c) Explain the characteristics of Bitcoin cloud. [6]

OR

- Q8** a) Explain, how the Blockchain technology be the platform of future Internet of Things. [5]
b) Explain: Enhancement of Blockchain with machine learning tools. [6]
c) Explain benefits of implementation of Blockchain technology with Robotics Process Automation. [5]



Total No. of Questions : 8]

SEAT No. :

P7609

[Total No. of Pages : 2

[6180] - 128

T.E. (Electronics & Computer)

DIGITAL SIGNAL PROCESSING

(2019 Pattern) (Semester - I) (Elective - I) (310345 C)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) Assume Suitable data if necessary.

Q1) a) Explain in detail Impulse Invariance technique for IIR filter design. What are its drawbacks? [10]

b) Apply Bilinear Transformation to following function and find H(z) [8]

$$H(s) = \frac{2}{(s+1)(s+2)} \text{ with } T = 1 \text{ sec}$$

OR

Q2) a) Explain in detail frequency sampling method of FIR filter design. [9]

b) Convert analog filter with system function H(s) into digital IIR filter using impulse invariance method. [9]

$$H(s) = \frac{10}{s^2 + 7s + 10}$$

Q3) a) Obtain direct form I and II structures for the following systems. [9]

$$y(n) = -0.1y(n-1) + 0.2y(n-2) + 3x(n) + 3.6x(n-1) + 0.6x(n-2)$$

b) What is the Finite word length effect and how it affects the FIR filter performance? [8]

OR

P.T.O.

Q4) a) Draw cascade and parallel realization for the system given by [9]

$$H(z) = \frac{2}{1 + 2z^{-1} - z^{-2}}$$

b) Explain Lattice-Ladder structure of IIR filter. [8]

Q5) a) What is sampling rate conversion? What is multirate DSP? Why is it required? [4]

b) Explain decimation by a factor ‘D’ and obtain the expression for the decimated signal at the output. [7]

c) With the help of neat waveform and diagram explain sampling rate conversion by non-integer factor. [7]

OR

Q6) a) What is the role of anti-aliasing and anti-imaging filters in a Decimator and interpolator respectively? [6]

b) Give the mathematical expressions for sampling rate conversion by non-integer factor. Can the positions of the decimator and interpolator be interchanged? Justify your answer. [8]

c) Draw block schematic for interpolation and Decimation. [4]

Q7) a) Give the architectural features of DSP Processor. [6]

b) How the DSP is useful in speech processing. Explain any application of speech processing using DSP. [6]

c) Explain how DSP is useful in Interference cancellation in ECG. [5]

OR

Q8) a) Explain the following related to Digital Signal Processor. [9]

i) Mac Unit

ii) ALU

iii) VLIW Architecture

b) Compare the features of DSP processor and microprocessor with respect to architecture. [8]



Total No. of Questions : 8]

SEAT No. :

P7610

[6180] - 129

[Total No. of Pages : 2

T.E. (Electronics & Computer Engineering)

SENSORS AND APPLICATIONS

(2019 Pattern) (Semester - I) (Elective - I) (310345 D)

Time : 2 ½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Assume suitable data, if necessary.
- 4) Use of non-programmable scientific calculator is allowed.

Q1) a) Explain working principle of hydrostatic pressure type of level measurement technique. [8]

b) Explain with neat sketch working principle of following differential head type of flow sensors- [9]

- i) Orifice plate
- ii) Venturi Tube

OR

Q2) a) Explain with neat diagram working principle of nuclear level gauge. [8]

b) Explain with neat sketch working principle of pitot static tube used for the measurement of airspeed aboard an aircraft. [9]

Q3) a) Draw a neat sketch of capacitive accelerometer. Explain working principle of capacitive accelerometer. [6]

b) Explain with neat sketch working principle of incremental optical encoder. [6]

c) Explain working principle of optical proximity sensors. [6]

OR

Q4) a) Explain working principle of LVDT as a displacement sensor. [6]

b) Explain weight measurement technique using load cell and strain gauges. [6]

c) Write a short note on CMOS image sensors. [6]

P.T.O.

- Q5)** a) Explain working principle of PZT actuators. State its applications. [8]
b) Explain Hall effect type magnetic field sensors. State the names of materials used for Hall effect devices. [9]

OR

- Q6)** a) Explain with neat block diagram the concept of SMART sensor system. [8]
b) Explain with neat sketch bulk micro-machined absolute pressure sensor. [9]

- Q7)** a) Draw a pneumatic circuit symbol for a poppet valve. Explain pneumatic lift system using a poppet valves and single acting cylinder. [6]
b) Explain principle of operation of stepper motor. [6]
c) Draw control valve characteristics and explain the terms. [6]
i) Quick Opening
ii) Linear and
iii) Equal Percentage.

OR

- Q8)** a) Draw and explain the symbols of following pneumatic valves. [6]
i) 5×2 valve
ii) 4×2 valve
iii) 3×2 valve
b) Explain control of single acting cylinder using directional control valve. [6]
c) Explain how actuators are classified. Explain any one type of actuators. [6]



Total No. of Questions : 8]

SEAT No. :

P7611

[Total No. of Pages : 2

[6180]-130

T.E. (Electronics and Computer Engineering)
SOFTWARE ENGINEERING AND PROJECT MANAGEMENT
(2019 Pattern) (Semester - II) (310352)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.

- Q1)** a) Explain COCOMO model for project estimation with suitable example. [8]
b) What is project scheduling? What are the basic principles of project scheduling. [6]
c) What is task network in project scheduling. [4]

OR

- Q2)** a) Compare Lines of code (LOC) and Function Point (FP) based estimation of software. [8]
b) What is time line chart? Explain with suitable example. [6]
c) What are the categories of software Engineering resources. [4]

- Q3)** a) What are the software design quality attributes and quality guidelines? [7]
b) Explain the design concept: Functional Independence. A design should have high cohesive and low coupling. Justify. [6]
c) Explain guidelines of component level designing. [4]

OR

- Q4)** a) Why is software architecture being important? Explain Data centered Architectural style in detail. [7]
b) Explain in detail call and return architecture style. [6]
c) What is difference between abstraction and refinement. [4]

P.T.O.

- Q5)** a) Explain RMMM plan with suitable example. [8]
b) Explain SCM repository in detail. What are the advantages of SCM repository. [6]
c) What are the different categories of risk? [4]

OR

- Q6)** a) What are the layers of SCM process? Explain each in detail. [8]
b) Explain Risk identification and assessment process for a software project. [6]
c) Write a short note on: Risk table. [4]

- Q7)** a) What is software testing? Explain software testing strategies for software development. [7]
b) How Top down and Bottom up integration is achieved? [6]
c) Compare Alpha and Beta Testing. [4]

OR

- Q8)** a) Explain Defect life cycle in detail. [7]
b) What is test plan, test scenario and test cases. How to write test cases for Login page. [6]
c) Differentiate between verification and validation. [4]



Total No. of Questions : 8]

SEAT No. :

P7612

[Total No. of Pages : 2

[6180]-131

**T.E. (Electronics & Computer Engineering)
COMPUTER NETWORKS AND SECURITY
(2019 Pattern) (Semester-II) (3103353)**

Time : 2½ Hours

[Max. Marks : 70

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*

Q1) a) List and Explain functions of data link layer. [4]

b) What is need of framing? What are the different technique of framing?
Explain any two. [6]

c) What are the noiseless channels? Explain simplest protocol with suitable
diagram. [6]

OR

Q2) a) What is point to point protocol? Explain in detail [4]

b) What are the types of media access control? Explain in detail controlled
access technique. [6]

c) Explain Hub with suitable diagram. [6]

Q3) a) Explain network layer services in detail. [6]

b) Explain IPv4 address in detail [6]

c) Explain Internet Group Message Protocol (IGMP) with suitable architecture
diagram. [6]

OR

P.T.O.

- Q4)** a) What is congestion control? List the typical QOS parameters in the transport layer and explain each one. [6]
b) Explain in detail path vector routing with suitable diagram. [6]
c) Explain User Datagram Protocol with special features [6]

- Q5)** a) Explain feature of HTTP. [4]
b) Explain TELNET in detail with respect to server and client communication. [6]
c) What the different commands used in FTP? Explain File transfer Protocol in detail. [8]

OR

- Q6)** a) What is streaming of Audio / Video. Explain. [4]
b) What is DNS? Explain Domain Name Space in detail. [6]
c) Explain SNMP with suitable diagram. What is the role of structure management Information in SNMP explain. [8]

- Q7)** a) List the different security goals. Explain. [4]
b) Explain secret key cryptography (cipher) with suitable diagram. [6]
c) What is Network Monitoring? How to perform network monitoring effectively [8]

OR

- Q8)** a) Explain UTP cabling for PC to PC [4]
b) Explain with neat diagram internet access through leased line. [6]
c) What is Protocol Analyzer? Explain the working with neat diagram [8]



Total No. of Questions : 8]

SEAT No. :

P7613

[Total No. of Pages : 2

[6180]-132

T.E. (E&C.E)

EMBEDDED PROCESSOR & APPLICATIONS

(2019 Pattern) (Semester-II) (310354)

Time : 2½ Hours]

[Max. Marks : 70]

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Draw neat labeled diagrams wherever necessary
- 3) Figures to the right side indicate full marks.
- 4) Assume Suitable data if necessary.

Q1) a) Compare ARM Cortex M3 with ARM7 TDMI [4]

- b) Write down the features of UART of LPC2148, Write an embedded C program to transmit character ‘E’ to PC. [6]
- c) Draw and explain interfacing of EEPROM using I2C communication to LPC2148. [8]

OR

Q2) a) Explain any 3 instructions of ARM7. [6]

- b) List the features of on chip ADC of LPC2148. [8]
- c) List the features of LPC2148. [4]

Q3) a) Explain any 4 instructions of ARM CORTEX M3. [8]

- b) Compare CORTEX A, CORTEX M, CORTEX R processors [5]
- c) Write a note on ARM processor development. [5]

OR

Q4) a) Write down the specifications of ARM CORTEX M3. [5]

- b) Draw detailed architecture of ARM CORTEX M3 [8]
- c) Enlist the advantages of ARM Cortex-M3 [5]

Q5) a) Enlist various registers required to configure Serial Communication of STM32F4xx Microcontroller. Explain any two with suitable example [9]

- b) Explain an algorithm to send “ENGINEER” serially via STM32F4xx controller to Desktop PC on HyperTerminal. Assume (UART, 9600 Baud Rate) [8]

OR

P.T.O.

Q6) a) Write a note on different types of registers of STM32F4xx. [7]

b) Draw an interfacing diagram to interface push button and LED using STM32F4xx microcontroller. [5]

c) Compare ARM Cortex M3 with ARM Cortex M4. [5]

Q7) a) Explain in brief Internet of Things? Draw its architecture. [8]

b) Write a note on Sensors and actuators. [6]

c) Write down the characteristics of Embedded System. [3]

OR

Q8) a) Draw and explain basic block diagram of Embedded System with IoT.[8]

b) Explain any one of the below with flow/block diagram. [9]

Smart Home automation

OR

Waste Management for Smart City using IoT



Total No. of Questions : 8]

SEAT No. :

P-8796

[Total No. of Pages : 2

[6180]-133

T.E. (Electronics and Computer Engineering)
SOFTWARE MODELING AND DESIGN (Elective - II)
(2019 Pattern) (Semester - II) (310355A)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6. and Q.7 or Q.8.
- 2) Figures to the right side indicate full marks.
- 3) Assume suitable data, if necessary.

- Q1)** a) Explain combined fragments such as alternatives, options and loops with suitable diagram. [8]
- b) Draw and explain swimlane diagrams? Explain purposes and benefits of swimlane. [8]

OR

- Q2)** a) Draw and explain sequence diagram? Explain notations used in sequence diagram. [8]
- b) What is activity diagram? Why use activity diagram? Explain the component of an activity diagram. [8]

- Q3)** a) What is object oriented design? Describe the different steps involved in the Object-oriented design process. [9]
- b) What is Usability Testing? What is a Usability Assessment? What is the Purpose of a Usability Test? [9]

OR

- Q4)** a) Draw and explain component diagram. State its advantages and disadvantages. [9]
- b) Explain different steps in designing business classes. Explain different types of design classes. [9]

P.T.O.

Q5) a) Explain software design principles and patterns. Differentiate software design principles and patterns. [9]

b) What is the purpose of General Responsibility Assignment Software Patterns (GRASP) in object-oriented design? How do GRASP patterns contribute to achieving a well-organized and modular design? [9]

OR

Q6) a) Explain the Polymorphism pattern in GRASP. How does it influence the assignment of responsibilities through dynamic behavior? [9]

b) Explain key objectives of software design principles. Explain any three software design principles in detail also write the advantages and disadvantages of them. [9]

Q7) a) What are the key components of a software architecture and how do they interact with each other? [9]

b) Describe the principles of object-oriented design and their relevance in software architecture. [9]

OR

Q8) a) Explain the concept of software components and how they are used in component-based software architectures. [9]

b) Discuss the challenges associated with achieving synchronization in concurrent software architectures. [9]



Total No. of Questions : 8]

SEAT No. :

P7614

[Total No. of Pages : 2

[6180]-134

T.E. (Electronics and Computer Engineering)

ADVANCED DATABASE MANAGEMENT SYSTEM

(2019 Pattern) (Semester - II) (Elective - II) (310355B)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Figures to the right side indicate full marks.
- 3) Assume suitable data, if necessary.

Q1) a) What is NoSQL database? Explain two types of NoSQL databases. [6]

b) Compare Relational and NoSQL databases. [6]

c) What is JSON? Explain features and data types of JSON. [8]

OR

Q2) a) Explain features of MongoDB. [6]

b) Differentiate between apache Cassandra and MongoDB. [6]

c) What is XML? Why is XML important? What are the benefits of using XML? [8]

Q3) a) Draw and explain Data Warehouse architecture. [8]

b) What is OLAP? Explain different types of OLAP in detail. [8]

OR

Q4) a) Explain components of Data Warehouse. Explain star schema in detail with example. [8]

b) Write a short note on: [8]

i) Decision support system

ii) Snowflake schema

P.T.O.

Q5) a) What is KDD? Explain KDD seven step process in detail. [8]

b) Explain benefits of Data Mining. Explain any two application of Data Mining in detail. [8]

OR

Q6) a) Draw and explain architecture of Data Mining. [8]

b) Explain predictive and descriptive algorithms in Data Mining. [8]

Q7) a) Compare Spatial and Temporal databases. [6]

b) Explain geographical information systems in detail with examples. [6]

c) Explain Deductive database in detail with example. [6]

OR

Q8) a) Explain Multimedia databases in detail with examples. [6]

b) What are active databases? Elaborate with example. [6]

c) Explain Mobile databases in detail with examples. [6]



Total No. of Questions : 8]

SEAT No. :

P7615

[6180]-135

[Total No. of Pages : 2

T.E. (Electronics & Computer Engineering)

POWER ELECTRONICS

(2019 Pattern) (Semester - II) (Elective - II) (310355 C)

Time : 2½ Hours

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of Non Programmable Calculator is allowed.
- 5) Assume suitable data if necessary.

Q1) a) Explain operation of single phase full converter for R load with neat circuit diagram and relevant waveforms. [11]

Derive expressions for average o/p voltage & rms o/p voltage?

b) A single phase half controlled bridge rectifier supplies a ripple free load current of 10 A and operates from the 110V, 60Hz mains. If the average o/p voltage is 75V, [6]

Calculate:

- i) Firing angle
- ii) RMS o/p voltage
- iii) RMS supply current

OR

Q2) a) Explain with circuit diagram three phase fully controlled converter with R load. Draw load current and load voltage waveforms with $\alpha=60^\circ$ and 90° . [12]

b) Give difference between SCR based controlled rectifiers and IGBT based controlled rectifiers. [5]

Q3) a) A step down chopper is operated from dc supply voltage of 230V. It has resistive load with $R = 10\Omega$. If duty cycle is 40%, calculate: [6]

- i) Average & rms o/p voltages
- ii) Average & rms o/p currents
- iii) Chopper efficiency

b) Explain with circuit diagram single phase full wave AC voltage controller for R-load with i/p voltage & o/p voltage & current waveforms. [6]

P.T.O.

- c) Explain working of step down chopper for R load and derive an expression for its average o/p voltage? [6]

OR

- Q4)** a) Draw circuit diagram of step up chopper and distinguish between step up & step down choppers. [6]

- b) What are various types of choppers? Explain operation of class-C (two quadrant) chopper with circuit diagram. [8]

- c) A step up chopper is operated from 220V dc supply and it provides 550V output. If chopping frequency is 1KHz, calculate on & off times of chopper. [4]

- Q5)** a) Single phase full bridge inverter is operated from 50V dc supply, it has a resistive load of $R = 5\Omega$. Find: [6]

i) rms o/p voltages at third & fifth harmonic (V_{o3} & V_{o5})

ii) Distortion factor (DF) of 3rd harmonic component

iii) Total harmonic distortion (THD)

- b) Explain working of single phase full bridge inverter for R-L load with input & output waveforms. [7]

- c) Distinguish between freewheeling diode with feedback diode. [4]

OR

- Q6)** a) Draw & explain control circuit for single phase inverters using PWM IC LM3524. [5]

- b) Draw a three phase inverter for balanced star R load? Explain its operation of 180° mode with gate signals & output waveforms. [12]

- Q7)** a) What are various types of electric Vehicles? Explain any one with block diagram. [6]

- b) What is UPS? Explain operation of Off-line UPS with block schematic. [6]

- c) Explain with block diagram HVDC transmission system. [6]

OR

- Q8)** a) Explain with diagram working principle of induction heating. [6]

- b) Explain with diagram architecture of EVs battery charger. [6]

- c) Explain battery specifications used in EVs for traction applications. [6]



Total No. of Questions : 8]

SEAT No. :

P7616

[Total No. of Pages : 2

[6180]-136

T.E. (Electronics and Computer)

PLC AND AUTOMATION

(2019 Pattern) (Semester - II) (Elective - II) (310355D)

Time : 2½ Hours

/Max. Marks : 70

Instructions to the candidates:

- 1) Attempt Q. No. 1 or Q. No. 2, Q. No. 3 or Q. No. 4, Q. No. 5 or Q. No. 6, Q. No. 7 or Q. No. 8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) a) Explain On Delay timer and Off Delay timer. [8]

b) Draw a ladder diagram for a two - motor system having the following conditions: [10]

The start Push button starts Motor 1; 10 seconds later Motor 2 will start. The stop Push button stops Motor 1; 15 seconds later Motor 2 stops.

OR

Q2) a) Explain any four arithmetic functions used in PLC programming. [8]

b) Draw a ladder diagram for following statement: [10]

Motor 1 (M1) starts as soon as start switch is ON; after 10 Seconds M1 goes off and Motor 2 (M2) starts. After 5 seconds M2 goes OFF and M3 starts. After 10 Seconds M3 goes off, M1 starts and the cycle is repeated. When stop switch is ON, all Motors are stop.

Q3) a) Explain test, check and assembly in connection with PLC installation. [9]

b) Explain electrical noise, leaky inputs and outputs in PLC. [9]

OR

P.T.O.

Q4) a) Explain need of program editing during commissioning. [9]

b) Explain need of grounding and various circuit protections used during installation. [9]

Q5) a) Explain Proportional, Derivative and integral control in detail. [9]

b) Explain functions of RTU and MTU in SCADA. [8]

OR

Q6) a) Explain HMI and it's interfacing with PLC. [9]

b) Explain block diagram of SCADA. [8]

Q7) a) Explain types of communication interfaces in detail. [8]

b) Write short note on: [9]

i) DeviceNet

ii) MODBUS

iii) CAN

OR

Q8) a) What are advantages of standard industrial network? [8]

b) Write short note on: [9]

i) Fieldbus

ii) EtherNet/IP Protocol

iii) ControlNet

