7th Semester 24

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETEC-401 ***Subject: Embedded Systems***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Internal Choice is indicated

Q1 Attempt all questions: **(5x5=25)**

a) What is embedded system? Is Personal Computer an embedded system?

b) Explain the concept of TMOD and SBUF in detail.

c) Explain how RTOS is different from normal operating system.

d) What do you understand by the term"Banked Register " in ARM.

e) Explain the term

i) Watch Dog Timer(WDT)

ii) Brown on Reset (BoR)

iii) Debugging.

Q2 a) Write a program in 8051 using interrupt to generate 10Khz frequency on P1.5. **(6)**

b) Explain the features of 8051 microcontroller with the help of block diagram. **(6.5)**

OR

Q3 a) Explain the following instructions: **(6)**

i) ADDLW k

ii) SWAPF f,d

iii) BTFSC f,b

iv) BSF

v) CLRF

vi) INCFSZ f,d

b) Explain various addressing modes of PIC Microcontroller. **(6.5)**

Q4 a) Draw and explain the structure of Current Program Status Register (CPSR) in ARM processor. **(6)**

b) Explain the architecture of ARM7 processor. **(6.5)**

OR

Q5 a) Discuss AMBA, I2C and SPI bus Protocols in detail. **(6)**

b) Explain different types of bus arbitration in ARM processors. **(6.5)**

Q6 What is embedded software? What are the important characteristics for measuring software quality? **(12.5)**

OR

Q7 a) What are different tools used in embedded systems? Explain the compliers used in Embedded systems. **(6)**

b) What is Real-time system? Differentiate between Soft Real-Time Systems and Hard Real-time Systems. **(6.5)**

P.T.O.

Q8 a) Discuss the problem of sharing data by multiple tasks and routines. What is the solution for shared data problem? **(6)**

b) Explain the features of RTOS. List the functions of RTOS-kernal. **(6.5)**

OR

Q9 a) Differentiate between Multi Tasking and Multi Threading. **(6.5)**

b) Write short note on the following: **(6)**

i) RT-Linux

ii) Real Time- Scheduling

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(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETEC-403	*Subject: Optoelectronics and Optical Communication*
Time: 3 Hours	*Maximum Marks: 75*

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 Attempt all Questions: **(2.5x10=25)**

a) State the advantages of optical fiber communication.
b) What is a graded index fiber and where is it used?
c) What is chromatic dispersion?
d) Define Snell's law for total internal reflection.
e) Define numerical aperture and acceptance angle.
f) With a neat diagram, explain the structure of an optical fiber
g) Which type of light source is suitable for optical communications?
h) Why do we use photodiode detectors in optical communications?
i) At what principle does optical fiber communication take place?
j) Discuss the three optical windows based on operating wavelength for optical fiber communication.

UNIT-I

Q2 a) On the basis of ray theory derive the expression for Numerical aperture and Acceptance Angle. **(6.5)**

b) Explain the Mode theory for circular waveguides in detail. Explain different types of Scattering losses occurring in Optical Fiber. **(6)**

Q3 a) Explain the fabrication and mechanical properties of optical fiber in detail. **(6.5)**

b) What is differences between Step index and Graded index fibers? **(6)**

UNIT-II

Q4 a) Write a short note on the dispersion-shifted fiber and dispersion flattened fiber. **(6.5)**

b) When the refractive index of core is 1.55 and the relative refractive index is 1%, Calculate the
i) Critical angle at the core-cladding interface and **(6)**
ii) Numerical Aperture

Q5 a) Describe briefly linear scattering losses in optical fibers with regard to: **(6.5)**
i) Rayleigh Scattering
ii) MIE Scattering

b) A multimode step-index fiber with a core diameter of 0.85 μm and a relative index difference of 1.5% is operating at a wavelength of 0.85 μm. If the core refractive index is 1.48, estimate: (a) the normalized frequency for the fiber; (b) the number of guided modes. **(6)**

UNIT-III

Q6 a) Briefly outline the advantages and drawbacks of the LED in comparison with injection laser for use as a source in optical fiber communications **(6.5)**

P.T.O.

b) A p-n photodiode has a quantum efficiency of 50% at a wavelength of 0.9 μm. Calculate responsivity and received optical power if the mean photocurrent is 10^{-6} A. Find the corresponding number of received photons at this wavelength. **(6)**

Q7 a) What do you mean by a photodiode detector? Explain the avalanche photodiode detector in detail. **(6.5)**

b) Write a short note on Semiconductor lasers for optical fiber communication systems. **(6)**

UNIT-IV

Q8 a) What do you mean by Multiplexing? Explain Optical Time Division Multiplexing in detail. **(6.5)**

b) Explain Network Topologies and Mac Protocols used for optical fibre communication systems. **(6)**

Q9 a) Write a short note on the Sub carrier Multiplexing. **(6.5)**

b) Explain Optical Transport Network, Optical Access Network and Optical Premise Network. **(6)**

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ETEC-403

(Please write your Exam Roll No.) *Exam No. .....*

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETEC-405 ***Subject: Wireless Communication***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions including Q.No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 Answer the following briefly:

a) Define Co-Channel cells with relevant diagram? What is Co-Channel Interference and how can it be reduced? **(3)**

b) What is SIM card? What information is stored in it? What are IMSI, TMSI and MSRN numbers in GSM? **(4)**

c) Why hexagonal shape is preferred in cellular mobile system and explain frequency reuseconcept. **(3)**

d) What is fading in cellular networks? Compare Rayleigh & Ricean fading. **(4)**

e) Explain the power saving modes of Bluetooth devices. **(2)**

f) Discuss the handoff detection strategies: MCHO, NCHO and MAHO. **(3)**

g) What is the advantage of IPV6over IPV4 **(3)**

h) Explain the WLL architecture with neat diagram. **(3)**

UNIT–I

Q2 a) Briefly explain the frequency reuse concept and its importance. How does capacity of a network increase with help of Cell Splitting and Cell Sectoring techniques in Cellular Mobile networks. Draw relevant neat diagrams. **(6.5)**

b) With help of a flow chart discuss the Subrating Scheme for channel assignment in a mobile cellular network. **(6)**

Q3 a) What do you understand by Unlicensed and Licensed bands? Give their examples. Compare the High Tier cellular, the cordless and low-tier PCS telephony systems based on their various characteristics such as cell size, user speed, coverage area, handset complexity, and handset power consumption, speech coding rates and delay or latency. **(6.5)**

b) A certain city has an area of 1300 square miles and is covered by a cellular system using a seven-cell reuse pattern. Each cell has a radius of four milesand the city is allocated 40 MHz of spectrum with a full duplex channelbandwidth of 60 kHz. Compute,

(area of a hexagon is 2.5981 R^2)

i) the number of cells in the service area **(2)**

ii) the number of channels per cell **(2)**

iii) total Number of subscribers that can be served **(2)**

UNIT -II

Q4 a) Explain how data encryption is done in GSM systems, with diagram, explaining the role of SIM, A3, A5 and A8 algorithms. **(6.5)**

P.T.O.

ETEC-405
D-1/2

b) Explain the importance of Handoff Threshold (Delta Δ) in GSM Networks with relevant diagrams. What impact does it have on the performance of the network? **(6)**

Q5 a) Explain the principle of Code Division Multiple access systems with supporting diagram. What are the advantages of CDMA technique over FDMA and TDMA techniques. **(6.5)**

b) Why does power control become one of the main issues for the efficient operation of CDMA? What are the 2 types of power control? Why is it essential to implement power control in Reverse channel in IS 95 CDMA systems? **(6)**

UNIT-III

Q6 a) What is EDGE & which generation does it belong to? Explain how EDGE achieves greater data rates than allowed in GSM. **(6.5)**

b) Explain the IMT-2000 vision. State the paradigm shift from 2G to 3G systems. Differentiate between W-CDMA and CDMA 2000. **(6)**

Q7 a) Explain the packet flow if two mobile nodes communicate and both are in foreign networks. What additional routes do packets take if reverse tunneling is required? **(6.5)**

b) What are the salient features of 4G systems? Differentiate between 3G and 4G systems. Name the techniques used in 4G systems for improving the performance of the network. **(6)**

UNIT-IV

Q8 a) Differentiate between Adhoc Networks and Infrastructure Networks along with neat diagrams showing their architecture. Discuss the Hidden &Exposed Node problem in MANET **(6.5)**

b) Draw piconet and scatternet. Describe the working of Bluetooth technology with diagram. **(6)**

Q9 a) Compare Iridium and GlobalStar under following points: **(6.5)**

i) No.ofStatellites ii) Attitude Coverage
iii) Min Elevation iv)Access Method
v) Bit Rate vi)No.of Channels
vii)Frequencies

b) Discuss the different deployment issues in wireless local loop deployment. **(6)**

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ETEC-405
D-2/2

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END TERM EXAMINATION

SEVENTH SEMESTER (B.TECH) JANUARY-2024

Paper Code: ETIT-401 ***Subject: Advanced Computer Networks***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions including Q. no.1 which is compulsory. Select one question from each unit.

Q1 Answer the following:

(a) What are then services offered by transport layer? **(3)**

(b) Compare distance vector routing with path vector routing? **(3)**

(c) List down the various characteristics of Big Data? **(3)**

(d) What are the different timers used in Routing Information Protocol (RIP) **(3)**

(e) What do you understand by Next Generation Networks? **(2)**

(f) Define count to infinity problem? **(2)**

(g) Draw the UDP Header format? **(2)**

(h) What the following terms stand for: **(3)**
(i)DVMRP (ii) OSPT (iii) SONET

(i) ARP is used to convent the _____address into_____address. **(2)**

(j) What are the benefits of optical networking? **(2)**

UNIT-I

Q2 Differentiate between IPv4 and IPV6? **(12.5)**

Q3 Explain any one routing protocol in detail? **(12.5)**

UNIT-II

Q4 Draw the header format of TCP and explain each field in details? **(12.5)**

Q5 What is congestion? How TCP deals with the congestion in the network? **(12.5)**

UNIT-III

Q6 Discuss the SONET architecture in details? **(12.5)**

Q7 Discuss the queue management algorithms used by SONET details? **(12.5)**

UNIT-IV

Q8 Define cloud computing? Discuss the various service model supported by the cloud computing? **(12.5)**

Q9 Write short note on the following: **(12.5)**
(a) VolP
(b) SMTP

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY-2024

Paper Code: ETIT-403 **Subject: Cryptography and Network Security**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.No1 which is compulsory. Internal Choice is indicated.

Q1 Attempt **any five:** **(5x5=25)**

a) Briefly explain Deffie Hellman key exchange with an example.

i) Write and explain the digital signature algorithm.

ii) Explain in detail Hash Functions.

b) Define threat and attack. What is the difference between passive and active security threats?

c) What are the two general approaches to attacking a cipher? What is the difference between a block cipher and a stream cipher?

d) Describe the MD5 message digest algorithm with necessary block diagrams.

e) What is PGP? Why does PGP generate a signature before applying compression?

f) Explain Intrusion Detection system and its benefits.

g) Describe all the types Of Firewall.

h) Name three classes of intruders. Also explain Intrusion detection and prevention system?

Q2 a) What is mono alphabetic cipher and transposition cipher? How is it different from Caeser Cipher? **(6.25)**

b) Explain Linear and Differential cryptanalysis? Why is the middle portion of Triple DES a decryption rather than an Encryption? **(6.25)**

Q3 a) Explain Buffer flow attack. What is the difference between link and end-to-end encryption? **(6)**

b) What Characteristics are needed in a secure hash function? In what ways can a hash value be secured so as to provide message authentication? **(6.5)**

Q4 a) What do you mean by malicious software? What are the typical phases of operation of a worm or virusus? **(6.5)**

b) Write a short note on web security and how it is achieved. **(6)**

Q5 a) What is difference between Virus and Spyware? What is SHA-1 algorithm? **(6.25)**

b) What is the role of Key distribution centre? Perform encryption and decryption using algorithm for P = 3, Q = 17, e=7 and M=5. **(6.25)**

Q6 Attempt **any two** parts: **(6.25+6.25)**

a) Explain IPSec.

b) Cyber Forensics.

c) Kerberos.

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY-2024

Paper Code: ETIT-413 **Subject: Software Testing**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt any five questions in all including Q.No1 which is compulsory. Select one question from each unit.

Q1 Attempt **any Five** **[5x5=25]**

a) Differentiate between static and dynamic testing.
b) Distinguish between error, bug, fault and Failure with the help of suitable example.
c) Explain that Verification and Validation are often used interchangeably. Define these terms and establish their relationship with testing.
d) Define cause effect graphing technique.
e) What is risk, and how risk analysis is useful?
f) Is complete testing possible? When to stop testing? Explain the limitation of testing.

UNIT–I

Q2 a) Explain "Testing Life Cycle" with a neat diagram? **[6]**
b) How graph theory is useful in testing? **[6.5]**

Q3 a) Is complete testing possible? When to stop testing? Explain the limitation of Testing. **[6]**
b) What are the testing activities performed during requirement analysis phase of SDLC? **[6.5]**

UNIT–II

Q4 a) What is Cyclomatic Complexity, and how is it calculated for a software program? Explain with the help of an example. **[6]**
b) Describe the key elements of a cause-effect graph, such as conditions, causes, and effects. **[6.5]**

Q5 a) What is Boundary Value Analysis (BVA) in software testing? What are the boundary values for an input range of 1 to 100? Explain.**[6]**
b) What is Equivalence Class Testing (ECT), and how does it simplify the selection of test cases? **[6.5]**

UNIT–III

Q6 a) Consider a program for determination of previous date. **[6]**

1<=month<=12
1<=day<=31
1912<=year<=2020

Design decision table for given scenario.

b) Explain how risk matrix can be used to prioritize the test cases. Explain with example. Why do we need to prioritize the test cases? **[6.5]**

P.T.O.

ETIT-413
Q 1/2

Q7 a) What is debugging? Describe various debugging approaches. **[6]**
b) What is regression testing, and why is it an essential part of the software development process? **[6.5]**

UNIT–IV

Q8 a) How Object Oriented testing is different from Procedural testing?**[6]**
b) "Software testing is an incremental process", justify the statement. **[6.5]**

Q9 Write down Short note on following (**any two**): **[6.25, 6.25]**

a) Class Testing
b) GUI Testing
c) Dynamic testing tools.

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ETIT-413
Q 2/2

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END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETCS-403 Subject: Software Testing and Quality Assurance

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1 Answer the following in brief **(5x5=25)**

a) Discuss the tester role in software Development
b) Compare Testing and Debugging.
c) Distinguish between Quality Assurance and Quality control
d) Explain Decision Table based Testing with example
e) Discuss Software Test Automation

UNIT-I

Q2 a) Discuss the limitations of Software Testing **(6)**
b) Explain the Seven step software testing process in detail **(6.5)**

OR

Q3 a) Compare Verification and Validation **(6)**
b) What is Quality management? Discuss the methods of quality management **(6.5)**

UNIT-II

Q4 a) Discuss various integration testing approaches **(5)**
b) Explain Boundary Value Analysis and Equivalence Class Partitioning with suitable examples **(7.5)**

OR

Q5 a) Compare black box testing and white box testing **(5)**
b) Draw the control flow graph and calculate cyclomatic complexity for the given code **(7.5)**

```
1. IF A = 354
2. THEN IF B > C
3. THEN A = B
4. ELSE A = C
5. END IF
6. END IF
7. PRINT A
```

UNIT-III

Q6 a) Explain Total Quality Management **(6)**
b) Discuss the Six sigma concept in detail **(6.5)**

OR

Q7 a) What is zero defect movement? Explain **(6)**
b) Explain CMM with it's various levels **(6.5)**

UNIT-IV

Q8 a) What do you mean by Regression Testing? Explain the various steps of regression testing process **(7.5)**
b) Explain the testing tool Selenium **(5)**

OR

Q9 a) What do you mean by Test Management Process? Explain the various Steps in test management process **(6.5)**
b) Write short notes on Object Oriented Testing **(6)**

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(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETCS-409 *Subject: Intellectual Property Rights*

Time: 3 Hours *Maximum Marks: 75*

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 Attempt **any five**:-

(a) Whats is an IPR? Why is it needed in a society? **(5)**

(b) Explain the term "copyright" and its significance. **(5)**

(c) Explain the significance of "trademark" in industry and commerce? **(5)**

(d) What is the state of biotechnology research and its protection in India? **(5)**

(e) Is "copyright" same as "trademark"? Give illustrations to demonstrate. **(5)**

(f) What are legal issues in biotechnology research rights management? **(5)**

UNIT-I

Q2 (a) Describe the state of Intellectual Property Rights in India. **(6)**

(b) Explain the process of patent filing. **(6.5)**

Q3 (a) What is the origin of IPR and how can it lead to protection of intellectual property from infringement? **(6)**

(b) What are Utility models? How can it protect technical inventions from commercial exploitation? **(6.5)**

UNIT-II

Q4 (a) What are industrial design patents and their scope? **(6)**

(b) Explain the copyright search process with the help of a diagram. Explain steps in brief. **(6.5)**

Q5 (a) What is copyright infringement? Explain with illustrations. **(6)**

(b) Explain the difference between designs and patents. **(6.5)**

UNIT-III

Q6 (a) Explain the role of trademark in commerce. **(6)**

(b) Write a short note on protection of breeder's rights in IPR. **(6.5)**

Q7 (a) What is a trademark license and what are its benefits? **(6)**

(b) What is the need to protect a domain name and how can it be done? **(6.5)**

UNIT-IV

Q8 (a) What are the legal protections available to a biotechnology researcher in India. What are its limitations? **(6)**

(b) Write a short note on guidelines for examination of biotechnology patents applications in India. **(6.5)**

Q9 (a) Discuss in detail a case study in IPR. **(6)**

(b) Discuss a legal provision that protects the interests of an Indian farmer in relation to plant varieties. **(6.5)**

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(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETCS-413 ***Subject: Data Mining and Business Intelligence***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit. Assume missing data, if any.

Q1 Attempt all questions:-

(a) List the characteristics of Datawarehouse. **(5)**

(b) State the differences between informational system and operational system. **(5)**

(c) How granularity plays its role in information package? **(5)**

(d) Differentiate between OLAP and data mining. **(5)**

(e) Discuss the KDD steps in brief. **(5)**

UNIT-I

Q2 (a) Discuss the basic components of datawarehouse with the help of a diagram. **(6.5)**

(b) Explain the differences between OLAP and OLTP with suitable example. **(6)**

Q3 (a) List out some popular ETL tools and briefly describe their key features. **(6.5)**

(b) Discuss junk dimensions and its applications in datawarehouse. **(6)**

UNIT-II

Q4 (a) How Dimensional modelling is different from E-R modelling technique? Explain with example. **(6.5)**

(b) What are the main types of OLAP operations and how do they support decision making? Discuss in detail. **(6)**

Q5 Discuss the challenges a company might face when implementing data warehouse asa part of its business strategy. **(12.5)**

UNIT-III

Q6 Explain the primary benefits of implementing data mining techniques in business operations. **(12.5)**

Q7 Describe about the fundamental idea behind the K-Nearest Neighbour algorithm. **(12.5)**

UNIT-IV

Q8 What is primary objective of the K-means algorithm, and how does it achieve clustering. **(12.5)**

Q9 Discuss some popular data mining tools used in the industry today. **(12.5)**

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(Please write your Exam Roll No.) *Exam Roll* .....

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETCS-423	*Subject: Advanced DBMS*
Time: 3 Hours	*Maximum Marks: 75*

Note: Attempt five questions in all including Q. No.1 which is compulsory. Select one question from each unit.

Q1 Attempt **any five** questions:- **(5x5=25)**

(a) How object-oriented database is different from relational database?
(b) Explain various steps of query processing with the help of a diagram.
(c) Describe with the help of an SQL query requiring join operation, Selection and projection.
(d) Describe XML specifications relate to Web Services and service-oriented architectures.
(e) What are Database Security features? Discuss with example how Oracle manages database security.
(f) What are Cursors, Stored Procedures and Triggers? Explain each with the help of an example code.
(g) What are Views in SQL? What is the significance of views? Give an example code in SQL to create.

UNIT-I

Q2 (a) Draw diagram of the parallel database architecture. Explain its types and advantages and disadvantage. **(6)**
(b) Differentiate between DBMS and RDBMS. What are different Codd's 12 rules for Relational Database? **(6.5)**

Q3 (a) With the help of a diagram, explain the reference architecture of Distributed DBMS. How is this different from component Architecture of DDBMS? **(6)**
(b) Explain the following two ways to implement the object – oriented concepts in DBMS: **(6.5)**
(i) To extend the existing RDBMS to include object orientation.
(ii) To create a new DBMS that is exclusively devoted to OODBMS.

UNIT-II

Q4 (a) What do you understand by query optimization? What are query trees? Explain with an example. **(6)**
(b) What is multiversion concurrency control? Explain how multiversion concurrency control can be achieved based on time stamp ordering? **(6.5)**

Q5 (a) Explain the relational model concept and discuss the different relational model constraints. **(6)**
(b) Differentiate between DBMS and RDBMS. What are different Codd's 12 rules for Relational Database? **(6.5)**

UNIT-III

Q6 (a) Explain concept of inheritance in SQL with example. **(6)**
(b) Explain the following: **(6.5)**
(i) Dynamic SQL
(ii) Spatial Databases
(iii) Temporal Databases

P.T.O.

Q7 (a) What are mobile databases? Give characteristics of mobile databases. **(6)**
(b) Explain concept of object relational database and temporal database in detail. **(6.5)**

UNIT-IV

Q8 (a) Explain the following in the context of ORACLE/POSTGRESQL: **(6)**
(i) Triggers
(ii) Security
(iii) Data Dictionary
(b) Explain the data integrity and triggers in Oracle database management system. **(6.5)**

Q9 (a) List the index implementation available in PostgreSQL. Explain each index available in PostgreSQL. **(6)**
(b) List any four transaction management features of PostgreSQL. **(6.5)**

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(Please write your Exam Roll No.) *Exam Roll No. .....*

END TERM EXAMINATION

SEVENTH SEMESTER [B.TECH] JANUARY 2024

Paper Code: ETEE-419 ***Subject: Renewable Energy Resources***

Time: 3 Hours ***Maximum Marks: 75***

Note: Attempt five questions in all including Q.No.1 which is compulsory. Select one question from each unit.

Q1

(a) Discuss why it is necessary to develop non-conventional method of generating electrical energy. (4)

(b) Give any two applications of solar energy. (3)

(c) Discuss some organic materials used in bio mass plant? (5)

(d) Compare among different types of wind mills. (5)

(e) Discuss the advantages of tidal power plant. (4)

(f) Differentiate between biomass and biogas. (4)

Unit-I

Q2 (a) Interpret the principle of conversion of solar energy into heat. (6)

(b) Discuss the basic principle of solar photovoltaic power generation. Name and explain the main elements of PV systems. (6.5)

Q3 (a) Compare and Contrast among different types of solar collectors. (6)

(b) Explain the constructional details of a flat plate type solar collector. What are its main advantages? (6.5)

Unit-II

Q4 (a) Discuss the basic principle of wind energy conversion? Why a tall tower is essential for mounting a horizontal axis wind turbine? Explain. (8)

(b) Analyze the parameters which should be considered while selecting the wind mill location. (4.5)

Q5 (a) Analyze the operation of geothermal power plant with suitable diagrams. (8)

(b) Discuss various benefits of solar power generation in rural area. (4.5)

Unit-III

Q6 (a) What are the different biomass energy resources and what is the energy yield from each of them. (6.5)

(b) Interpret the process ofIncineration, Pyrolysis and Gasification. Discuss the difference among these processes. (6)

Q7 (a) Describe the procedure of ocean tides generation and also discuss how power can be trapped? Mention the limitation of this method. (8)

(b) Examine the factors that affect the biogas generation. (4.5)

Unit-IV

Q8 (a) Write short notes on: (6)

(i) Reverse Requirements

(ii) Frequency and Voltage Control

(b) Why do we require to connect the electrical power obtained from the renewable energy resources to be connected to the power grids. (6.5)

Q9 Use the neat sketch to explain the working principle of standalone and grid connected solar system. (12.5)

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