**20EC703**

**Hall Ticket Number:**

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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | |
| **January, 2024** | | **Electronics & Communication Engineering** | | |
| **Seventh Semester** | **Low Power VLSI** | | | |
| **Time:** Three Hours | | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | | **(4X14=56 Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | Draw the symbols of PMOS Depletion transistor. | CO1 | L1 | 1M |
|  | b) | List sources of power dissipations. | CO1 | L4 | 1M |
|  | c) | Define threshold voltage of a transistors | CO1 | L2 | 1M |
|  | d) | Draw the symbol of Transmission gate | CO1 | L1 | 1M |
|  | e) | Draw the Ideal transfer characteristics of an inverter. | CO2 | L1 | 1M |
|  | f) | What are the MOS Inverter Configurations | CO2 | L2 | 1M |
|  | g) | What is the difference between Switch Logic and Gate Logic? | CO3 | L2 | 1M |
|  | h) | Define propagation delay of a CMOS inverter | CO3 | L2 | 1M |
|  | i) | Define Threshold voltage | CO3 | L2 | 1M |
|  | j) | Define body effect. | CO3 | L2 | 1M |
|  | k) | Write any three characteristics of invertor | CO2 | L1 | 1M |
|  | l) | Expand VTCMOS | CO3 | L4 | 1M |
|  | m) | Compare Glitch power and switching power dissipations. | CO3 | L3 | 1M |
|  | n) | What are the different components of leakage power dissipation | CO4 | L2 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Explain the Evolution of IC Technology | CO1 | L2 | 7M |
|  | b) | Illustrate in detail about MOS Capacitor Fluid Model with neat sketch | CO1 | L3 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Explain the operation of nMOS Enhancement-Mode transistor with neat diagrams | CO1 | L2 | 7M |
|  | b) | Interpret in detail the Modes of Operation of MOS Transistors. | CO1 | L3 | 7M |
| **Unit-II** | | | | | |
| 4 |  | Draw and Explain the transfer characteristic of CMOS inverter | CO2 | L2 | 14M |
| **(OR)** | | | | | |
| 5 | a) | Determine Pull-up to Pull-down ratio for an nMOS inverter driven by another  nMOS inverter. | CO2 | L3 | 8M |
|  | b) | What are the advantages and disadvantages of Pass transistor | CO2 | L2 | 6M |
| **Unit-III** | | | | | |
| 6 | a) | What is leakage power dissipation? How can it be minimized? | CO3 | L1 | 7M |
|  | b) | Summarize on short-circuit power dissipation. | CO3 | L3 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Derive Expression for switching power dissipation. | CO3 | L3 | 7M |
|  | b) | What is sub threshold leakage current? Briefly explain the mechanisms that affect sub threshold leakage current. | CO3 | L1 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Write short notes on fabrication of multiple threshold voltages. | CO4 | L3 | 7M |
|  | b) | Identify the various approaches for minimizing leakage power. | CO4 | L4 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Define Battery-Driven System? How power dissipation is minimized using this technique. | CO4 | L2 | 7M |
|  | b) | List and explain the CAD Tools for Low Power VLSI Circuits. | CO4 | L3 | 7M |



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| **IV/IV B.Tech (Regular) DEGREE EXAMINATION** | | | | |
| **January, 2024** | | **Electronics & Communication Engineering** | | |
| **Seventh Semester** | **Advanced Sensors** | | | |
| **Time:** Three Hours | | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | | **(4X14=56 Marks)** |
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|  |  |  | CO | BL | M |
| 1 | a) | Define Sensor. | CO1 | L2 | 1M |
|  | b) | What is an IC sensor? | CO1 | L1 | 1M |
|  | c) | Define motion sensor. | CO1 | L1 | 1M |
|  | d) | What are the types of Hall Effect sensors? | CO1 | L2 | 1M |
|  | e) | What is optical sensor? | CO2 | L3 | 1M |
|  | f) | What are the advantages of fibre optic sensors? | CO2 | L2 | 1M |
|  | g) | List the applications of optical sensors? | CO3 | L2 | 1M |
|  | h) | Sensitivity of a sensor can be depicted by which plot? | CO3 | L2 | 1M |
|  | i) | Define resolution in sensors? | CO3 | L1 | 1M |
|  | j) | Give one applications of micro sensors. | CO3 | L2 | 1M |
|  | k) | Summarize the features of smart sensors. | CO4 | L3 | 1M |
|  | l) | Define multi-sensory system? | CO4 | L2 | 1M |
|  | m) | What is use of PIR sensor? | CO4 | L2 | 1M |
|  | n) | LM35 sensor is used to measure which parameter? | CO4 | L3 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Classify different types of sensors and explain | CO1 | L1 | 7M |
|  | b) | Discuss the various types of applications that can be used with Hall effect sensor | CO1 | L2 | 7M |
| **(OR)** | | | | | |
| 3 | a) | Explain the Micro machine technology. | CO1 | L2 | 7M |
|  | b) | Explain in detail the silicon planner Technology | CO1 | L1 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Discuss how optical fibre sensor works with an example. | CO2 | L1 | 7M |
|  | b) | Discuss in detail about Gas sensors. | CO2 | L2 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Explain about chemically modified electrodes | CO2 | L1 | 7M |
|  | b) | Explain about Thick Film Devices. | CO2 | L2 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Explain about thin film sensors? | CO3 | L2 | 7M |
|  | b) | Discuss about applications of Micro sensors | CO3 | L1 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Explain briefly about Acoustic steam leak detector? | CO3 | L2 | 7M |
|  | b) | Explain about Magnetic and Chemical signals in micro sensors? | CO3 | L1 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Explain the construction, operation and important characteristics of a smart sensor | CO4 | L1 | 7M |
|  | b) | Explain the concepts of redundant-system in interfacing of sensors? | CO4 | L2 | 7M |
| **(OR)** | | | | | |
| 9 |  | Explain briefly about Intelligent and smart sensors? | CO4 | L1 | 14M |

