

| Course Code: B20AD0E05                          |     |  |                  |    |     |
|---|-----|--|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |     |  |                  |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |     |  |                  |    |     |
| EMBEDDED SYSTEMS (Open Elective-IV)             |     |  |                  |    |     |
| (For CE, EEE & ME)                              |     |  |                  |    |     |
| Time: 3 Hrs.                                    |     |  | Max. Marks: 70 M |    |     |
| Answer ONE Question from EACH UNIT              |     |  |                  |    |     |
| All questions carry equal marks                 |     |  |                  |    |     |
| Assume suitable data if necessary               |     |  |                  |    |     |
|   |     |  | CO               | KL | M   |
| <b>UNIT-I</b>                                   |     |  |                  |    |     |
| 1.  | a). | Explain the Embedded systems and General computing system.                         | 1                | 2  | 7   |
|   | b). | Explain about Embedded systems major application areas.                            | 1                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 2.  | a). | Illustrate the purpose of embedded systems. Core of embedded system.               | 1                | 2  | 7   |
|   | b). | Explain memory, sensors and actuators, communication interface, embedded firmware. | 1                | 2  | 7   |
| <b>UNIT-II</b>                                  |     |  |                  |    |     |
| 3.  | a). | What are the various Characteristics, quality attributes of Microcontroller?       | 2                | 3  | 7   |
|   | b). | Explain about application specific, domain specific, embedded systems.             | 2                | 3  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 4.  | a). | Explain 8051 Micro Controller Architecture with a block diagram.                   | 2                | 3  | 7   |
|   | b). | Explain about memory organization, registers, oscillator unit, ports?              | 2                | 3  | 7   |
| <b>UNIT-III</b>                                 |     |  |                  |    |     |
| 5.  | a). | Differentiate Operating basics, types, RTOS.                                       | 3                | 2  | 7   |
|   | b). | Explain about tasks, process and threads, multiprocessing.                         | 3                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 6.  | a). | Explain the multitasking, types of multitasking.                                   | 3                | 3  | 7   |
|   | b). | What are the various non-pre-emptive, pre-emptive scheduling?                      | 3                | 3  | 7   |
| <b>UNIT-IV</b>                                  |     |  |                  |    |     |
| 7.  | a). | Explain the Task communication of RTOS, Shared memory and pipes.                   | 4                | 2  | 7   |
|   | b). | Explain about message passing, message queue, mailbox, signalling, RPC.            | 4                | 3  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 8.  | a). | Explain about various task communication/synchronization issues.                   | 4                | 3  | 7   |
|   | b). | Differentiate racing, deadlock, live lock, the dining philosopher's problem.       | 4                | 3  | 7   |
| <b>UNIT-V</b>                                   |     |  |                  |    |     |
| 9.  | a). | Explain the producer -consumer problem, Reader writers' problem.                   | 5                | 2  | 7   |

|     |     |  |   |   |   |
|-----|-----|--|---|---|---|
|     | b). | Explain about Priority Inversion, Priority ceiling, Task Synchronization techniques. | 5 | 2 | 7 |
|     |     | <b>OR</b>  |   |   |   |
| 10. | a). | Explain about semaphore, mutex, critical section objects, events.                    | 5 | 2 | 7 |
|     | b). | Explain about Integration and testing of embedded hardware and fire ware.            | 5 | 3 | 7 |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



**SRKR**  
**ENGINEERING COLLEGE**  
**AUTONOMOUS**

## SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

## IV B.Tech. I Semester MODEL QUESTION PAPER

## GREEN BUILDINGS (Open Elective-IV)

(For AIDS, CSBS, CSE, ECE, EEE, IT &amp; ME)

TIME: 3Hrs

Max. Marks: 70 M

Answer ONE Question from EACH UNIT

All questions carry equal marks

Assume suitable data if necessary

|                 |     |   | CO | KL | M |
|-----------------|-----|---|----|----|---|
| <b>UNIT-I</b>   |     |   |    |    |   |
| 1.              | a). | Discuss the concept of a 'Green' Building. Explain how it is different from a 'Sustainable Building'. Tabulate the typical features of a green building.  | 1  | 2  | 7 |
|                 | b). | What is a green field project? What aspects of building design, construction and operation are to be addressed for consideration as a sustainable site?   | 1  | 2  | 7 |
| <b>OR</b>       |     |   |    |    |   |
| 2.              | a). | What is the significance of selecting a site amongst multiple options in getting a higher green rating? If there is no option but one site for a building project, how do you maximise on getting green credits?  | 1  | 2  | 7 |
|                 | b). | What is a brown field project? What aspects of building design, construction and operation are to be addressed for consideration as a sustainable site?   | 1  | 2  | 7 |
| <b>UNIT-II</b>  |     |   |    |    |   |
| 3.              | a). | Discuss the significance of using only mechanically processed building materials such as rammed earth, stabilised mud and adobe. To what extent can they replace cement and steel which are amongst the most energy intensive and GHG intensive construction materials? | 2  | 2  | 7 |
|                 | b). | Highlight the importance of recycling in building materials used for Green Buildings. Distinguish between Post Industrial and Post Consumer wastes used in the recycling process for building materials.  | 2  | 2  | 7 |
| <b>OR</b>       |     |   |    |    |   |
| 4.              | a). | 'Cement and Steel though energy intensive, are versatile building materials. However, we can optimise their usage using a host of technologies and design systems.' Explain a few examples supporting the above statement.  | 2  | 2  | 7 |
|                 | b). | Identify value added finishes used for increasing the Indoor Environmental Quality of a green building. How can we justify their additional cost in attaining green credentials for buildings?  | 2  | 2  | 7 |
| <b>UNIT-III</b> |     |   |    |    |   |
| 5.              | a). | What is the Energy Conservation Building Code of India? What kind of buildings is required to comply with it? What is its relevance to getting a  | 3  | 2  | 7 |

|     |     |  |   |   |   |
|-----|-----|--|---|---|---|
|     |     | green building rating?   |   |   |   |
|     | b). | What is rainwater harvesting (RWH)? Why is it important in the sustainability of built environment? How do you estimate a building's RWH potential and design a storage or a percolation system?   | 3 | 2 | 7 |
|     |     | <b>OR</b>  |   |   |   |
| 6.  | a). | What is grey water and black water? How can it be recycled in large building complexes? What are its potential reuse cases?  | 3 | 2 | 7 |
|     | b). | Discuss the idea of embodied energy. How do you go about reducing the embodied energy accumulated in a building project?   | 3 | 2 | 7 |
|     |     | <b>UNIT-IV</b>   |   |   |   |
| 7.  | a). | Explain the significance of day lighting in green buildings. How does one strike a balance between day lighting and heat gain?   | 4 | 2 | 7 |
|     | b). | Fans, Air Coolers and Air Conditioners are all used for Thermal Comfort, yet they do not use the same amount of energy per hour of operation. Discuss their usage from a green building perspective, to maintain occupant comfort and minimise energy usage. | 4 | 2 | 7 |
|     |     | <b>OR</b>  |   |   |   |
| 8.  | a). | What are green roofs? What is their role in a green buildings. Explain with a case study.  | 4 | 2 | 7 |
|     | b). | Write a brief note on the scope of building automation and the role of BMS (Building Management System) in optimising the functionality of the managed spaces and resource consumption.  | 4 | 2 | 7 |
|     |     | <b>UNIT-V</b>  |   |   |   |
| 9.  | a). | Write a brief note on CII, IGBC and it's green rating programmes in India. State the rating levels offered by them.  | 5 | 2 | 7 |
|     | b). | Write a brief note on TERI, GRIHA Council and it's green rating programmes in India. State the rating levels offered by them   | 5 | 2 | 7 |
|     |     | <b>OR</b>  |   |   |   |
| 10. | a). | Write a brief note on USGBC, GBCI and it's green rating programmes in India. State the rating levels offered by them.  | 5 | 2 | 7 |
|     | b). | Write a brief note on World Bank Group, IFC and it's green rating programmes in India. State the rating levels offered by them.  | 5 | 2 | 7 |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

**NOTE :** Questions can be given as A,B splits or as a single Question for 14 marks

| Course Code: B20CBOE05                          |     |  |                  |    |     |
|---|-----|--|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |     |  |                  |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |     |  |                  |    |     |
| BIGDATA ANALYTICS (Open Elective-IV)            |     |  |                  |    |     |
| (For CE, ECE, EEE & ME)                         |     |  |                  |    |     |
| Time: 3 Hrs.                                    |     |  | Max. Marks: 70 M |    |     |
| Answer ONE Question from EACH UNIT              |     |  |                  |    |     |
| All questions carry equal marks                 |     |  |                  |    |     |
| Assume suitable data if necessary               |     |  |                  |    |     |
|   |     |  | CO               | KL | M   |
| <b>UNIT-I</b>                                   |     |  |                  |    |     |
| 1.  | a). | List out different challenges in Conventional Systems while handling big data.                           | 1                | 2  | 6   |
|   | b). | Discuss about Google File System (GFS)? List out differences between HDFS and GFS                        | 1                | 2  | 8   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 2.  | a). | What are the types of Big Data and Describe the characteristics of Big Data?                             | 1                | 2  | 6   |
|   | b). | What is HDFS? Explain about the building blocks of Hadoop?   | 1                | 2  | 8   |
| <b>UNIT-II</b>                                  |     |  |                  |    |     |
| 3.  | a). | Explain how map reduce jobs run on YARN  | 2                | 2  | 7   |
|   | b). | How sorting & shuffling is organized in map and reduce phases.   | 2                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 4.  | a). | Discuss about different counters in map reduce framework   | 2                | 2  | 7   |
|   | b). | What is serialization and Deserialization? Explain about java interfaces used in map reduce programming? | 2                | 2  | 7   |
| <b>UNIT-III</b>                                 |     |  |                  |    |     |
| 5.  | a). | Write a map reduce program to implement Friends of Friends algorithm.                                    | 3                | 3  | 7   |
|   | b). | Explain about map side join? List the advantages and limitations of Map side join?                       | 3                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 6.  | a). | Write a map reduce program to implement Matrix multiplication algorithm.                                 | 3                | 3  | 7   |
|   | b). | What is combiner? With a suitable example explain its advantages and limitations                         | 3                | 2  | 7   |
| <b>UNIT-IV</b>                                  |     |  |                  |    |     |
| 7.  | a). | Explain the Stream Model and Data Stream Management System Architecture.                                 | 4                | 2  | 7   |
|   | b). | Explain how to count 1's in a window using DGIM algorithm.   | 4                | 3  | 7   |

|            |            | <b>OR</b>  |          |          |          |
|------------|------------|--|----------|----------|----------|
| <b>8.</b>  | <b>a).</b> | What is Filtering Streams? Explain Bloom Filter with an example.   | <b>4</b> | <b>2</b> | <b>7</b> |
|            | <b>b).</b> | With a suitable example explain decaying window algorithm for Finding most popular elements.   | <b>4</b> | <b>3</b> | <b>7</b> |
|            |            | <b>UNIT-V</b>  |          |          |          |
| <b>9.</b>  | <b>a).</b> | With suitable examples explain the given features of PigLatin scripting language.<br>i) LOAD ii) DUMP iii) STORE iv) FOREACH v) GROUP BY | <b>5</b> | <b>3</b> | <b>7</b> |
|            | <b>b).</b> | What is Zookeeper explain its features with applications   | <b>5</b> | <b>2</b> | <b>7</b> |
|            |            | <b>OR</b>  |          |          |          |
| <b>10.</b> | <b>a).</b> | Explain the architecture of HIVE? List the features of HiveQL.   | <b>5</b> | <b>2</b> | <b>6</b> |
|            | <b>b).</b> | With a neat sketch explain different components of HBase architecture? How it is different from Traditional Data Base?                   | <b>5</b> | <b>2</b> | <b>8</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

**NOTE :** Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20CSOE10                          |            |   |               |          |          |
|---|------------|---|---------------|----------|----------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |            |   |               |          | R20      |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |            |   |               |          |          |
| BIG DATA ANALYTICS (Open Elective-IV)           |            |   |               |          |          |
| (For CE, ECE, EEE & ME)                         |            |   |               |          |          |
| Time: 3 Hrs                                     |            |   | Max. Marks:70 |          |          |
| Answer ONE Question from EACH UNIT              |            |   |               |          |          |
| All questions carry equal marks                 |            |   |               |          |          |
| Assume suitable data if necessary               |            |   |               |          |          |
|   |            |   | CO            | KL       | M        |
| <b>UNIT-I</b>                                   |            |   |               |          |          |
| <b>1</b>  | <b>a).</b> | Define Big data? Describe the main challenges of a big data in detail.  | <b>1</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain in detail about Types of Data and its applications.   | <b>1</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |   |               |          |          |
| <b>2</b>  | <b>a).</b> | List the main characteristics of Big Data.  | <b>1</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain in detail about different open source Technologies.   | <b>1</b>      | <b>3</b> | <b>7</b> |
| <b>UNIT-II</b>                                  |            |   |               |          |          |
| <b>3</b>  | <b>a).</b> | Explain Hadoop Architecture with a neat diagram.  | <b>3</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain in detail about analyzing data with the Hadoop  | <b>2</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |   |               |          |          |
| <b>4</b>  | <b>a).</b> | Explain Components of Hadoop.   | <b>2</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain in detail about Hadoop commands and design of HDFS  | <b>2</b>      | <b>3</b> | <b>7</b> |
| <b>UNIT-III</b>                                 |            |   |               |          |          |
| <b>5</b>  | <b>a).</b> | Explain working of following phases of Map Reduce with one example<br>i) Combiner Phrase ii) Shuffle and Sort Phase iii) Partitioning | <b>3</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Illustrate a simple example of the working of Map Reduce  | <b>3</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |   |               |          |          |
| <b>6</b>  | <b>a).</b> | Explain about Hadoop Yarn Architecture.   | <b>3</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain Parallel copying with distributed copying   | <b>3</b>      | <b>2</b> | <b>7</b> |
| <b>UNIT-IV</b>                                  |            |   |               |          |          |
| <b>7</b>  | <b>a).</b> | Explain about Pig Architecture.   | <b>4</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | What are the different Pig data types and syntax?   | <b>4</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |   |               |          |          |
| <b>8</b>  | <b>a).</b> | Describe two modes for running scripts in Pig.  | <b>4</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | How to execute the Pig Program  | <b>4</b>      | <b>3</b> | <b>7</b> |
| <b>UNIT-V</b>                                   |            |   |               |          |          |
| <b>9</b>  | <b>a).</b> | Explain about Hive Architecture with neat diagram.  | <b>5</b>      | <b>3</b> | <b>7</b> |
|   | <b>b).</b> | Explain in brief about Data manipulation in HIVE.   | <b>5</b>      | <b>2</b> | <b>7</b> |

|           |            | <b>OR</b>  |          |          |          |
|-----------|------------|--|----------|----------|----------|
| <b>10</b> | <b>a).</b> | Explain storage mechanism of HBase with an example.                | <b>5</b> | <b>2</b> | <b>7</b> |
|           | <b>b).</b> | Describe the following:<br>i)Hive Data types ii)joins iii)Indexing | <b>5</b> | <b>2</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

**NOTE :** Questions can be given as A,B splits or as a single Question for 14 marks





| Course Code: B20CSOE11                          |     |  |               |    |     |
|---|-----|--|---------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |     |  |               |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |     |  |               |    |     |
| DEEP LEARNING (Open Elective-IV)                |     |  |               |    |     |
| (For CE, ECE, EEE & ME)                         |     |  |               |    |     |
| Time: 3 Hrs                                     |     |  | Max. Marks:70 |    |     |
| Answer ONE Question from EACH UNIT              |     |  |               |    |     |
| All questions carry equal marks                 |     |  |               |    |     |
| Assume suitable data if necessary               |     |  |               |    |     |
|   |     |  | CO            | KL | M   |
| <b>UNIT-I</b>                                   |     |  |               |    |     |
| 1   | a). | Distinguish supervised vs unsupervised learning                      | 1             | 4  | 7   |
|   | b). | Explain about cross-validation                                       | 1             | 2  | 7   |
| <b>OR</b>                                       |     |  |               |    |     |
| 2   | a). | What is Dimensionality reduction? Explain                            | 1             | 2  | 7   |
|   | b). | Explain about overfitting and under fitting                          | 1             | 2  | 7   |
| <b>UNIT-II</b>                                  |     |  |               |    |     |
| 3   | a). | Illustrate Deep feed forward networks                                | 2             | 2  | 7   |
|   | b). | Explain about early stopping   | 2             | 2  | 7   |
| <b>OR</b>                                       |     |  |               |    |     |
| 4   | a). | Explain about Various Activation Functions                           | 2             | 3  | 7   |
|   | b). | What is Regularization for Deep learning? Explain Drop out           | 2             | 2  | 7   |
| <b>UNIT-III</b>                                 |     |  |               |    |     |
| 5   | a). | Illustrate Convolutional Network                                     | 3             | 2  | 7   |
|   | b). | What is max pooling? Explain   | 3             | 2  | 7   |
| <b>OR</b>                                       |     |  |               |    |     |
| 6   | a). | Illustrate Recurrent Neural Networks                                 | 3             | 2  | 7   |
|   | b). | Explain about Long Short-Term Memory                                 | 3             | 2  | 7   |
| <b>UNIT-IV</b>                                  |     |  |               |    |     |
| 7   | a). | What are Auto encoders? Explain                                      | 4             | 2  | 7   |
|   | b). | Explain about stochastic gradient descent                            | 4             | 2  | 7   |
| <b>OR</b>                                       |     |  |               |    |     |
| 8   | a). | What is denoising? Explain   | 4             | 2  | 7   |
|   | b). | What is Optimization for Deep Learning?                              | 4             | 2  | 7   |
| <b>UNIT-V</b>                                   |     |  |               |    |     |
| 9   | a). | Illustrate Alexnet architecture                                      | 5             | 2  | 7   |
|   | b). | Analyze how to improve performance of a model with Transfer learning | 5             | 4  | 7   |
| <b>OR</b>                                       |     |  |               |    |     |

|           |            |                                |                           |                |          |
|-----------|------------|--------------------------------|---------------------------|----------------|----------|
| <b>10</b> | <b>a).</b> | Illustrate ResNet architecture | <b>5</b>                  | <b>2</b>       | <b>7</b> |
|           | <b>b).</b> | Write about Image Segmentation | <b>5</b>                  | <b>3</b>       | <b>7</b> |
|           |            | <b>CO-COURSE OUTCOME</b>       | <b>KL-KNOWLEDGE LEVEL</b> | <b>M-MARKS</b> |          |

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20CSOE12                          |            |  |               |          |          |
|---|------------|--|---------------|----------|----------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |            |  |               | R20      |          |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |            |  |               |          |          |
| INTERNET OF THINGS (Open Elective-IV)           |            |  |               |          |          |
| (For CE, EEE & ME)                              |            |  |               |          |          |
| Time: 3 Hrs                                     |            |  | Max. Marks:70 |          |          |
| Answer ONE Question from EACH UNIT              |            |  |               |          |          |
| All questions carry equal marks                 |            |  |               |          |          |
| Assume suitable data if necessary               |            |  |               |          |          |
|   |            |  | CO            | KL       | M        |
| <b>UNIT-I</b>                                   |            |  |               |          |          |
| <b>1</b>  | <b>a).</b> | Explain the Characteristics of Internet of Things.                                   | <b>1</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Describe in detail about the IoT levels .  | <b>1</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |  |               |          |          |
| <b>2</b>  | <b>a).</b> | Explain in detail about the A Simplified IoT Architecture.                           | <b>1</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Discuss in detail about the logical design of IoT.                                   | <b>1</b>      | <b>2</b> | <b>7</b> |
| <b>UNIT-II</b>                                  |            |  |               |          |          |
| <b>3</b>  | <b>a).</b> | Define in detail about Wired Communication Technologies.                             | <b>2</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain the constrained application protocol (CoAP).                                 | <b>2</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |  |               |          |          |
| <b>4</b>  | <b>a).</b> | Detailed discussion about Bluetooth Low Energy.                                      | <b>2</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain in detail about MQTT communication technology.                               | <b>2</b>      | <b>2</b> | <b>7</b> |
| <b>UNIT-III</b>                                 |            |  |               |          |          |
| <b>5</b>  | <b>a).</b> | Explain about Basic building blocks of an IOT device.                                | <b>3</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Describe in detailed about Components of Arduino board.                              | <b>3</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |  |               |          |          |
| <b>6</b>  | <b>a).</b> | Explain in details about radio Frequency Identification technology.                  | <b>3</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Write a program for Arduino interface for Temperature dependent Auto cooling system. | <b>3</b>      | <b>2</b> | <b>7</b> |
| <b>UNIT-IV</b>                                  |            |  |               |          |          |
| <b>7</b>  | <b>a).</b> | Explain about Data Acquiring and storage.  | <b>4</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Describe in detailed about Knowledge Acquiring.                                      | <b>4</b>      | <b>2</b> | <b>7</b> |
| <b>OR</b>                                       |            |  |               |          |          |
| <b>8</b>  | <b>a).</b> | Describe about the Transaction and Business Processes.                               | <b>4</b>      | <b>2</b> | <b>7</b> |
|   | <b>b).</b> | Explain about Managing and Storing Processes.  | <b>4</b>      | <b>2</b> | <b>7</b> |
| <b>UNIT-V</b>                                   |            |  |               |          |          |
| <b>9</b>  | <b>a).</b> | Explain the Security Requirements and Threat Analysis                                | <b>5</b>      | <b>2</b> | <b>7</b> |

|           |            |  |          |          |          |
|-----------|------------|--|----------|----------|----------|
|           | <b>b).</b> | Illustrate in details about case study of smart irrigation system. | <b>5</b> | <b>2</b> | <b>7</b> |
|           |            | <b>OR</b>  |          |          |          |
| <b>10</b> | <b>a).</b> | Explain about the Access control secure message communication.     | <b>5</b> | <b>2</b> | <b>7</b> |
|           | <b>b).</b> | Illustrate about Home intrusion detection.                         | <b>5</b> | <b>2</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20ECOE07                             |     |  |                  |    |     |
|--|-----|--|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)    |     |  |                  |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER         |     |  |                  |    |     |
| INTRODUCTION TO VLSI TECHNOLOGY (Open Elective-IV) |     |  |                  |    |     |
| (For AIDS, CE, CSBS, CSE, EEE, IT & ME)            |     |  |                  |    |     |
| Time: 3 Hrs.                                       |     |  | Max. Marks: 70 M |    |     |
| Answer ONE Question from EACH UNIT                 |     |  |                  |    |     |
| All questions carry equal marks                    |     |  |                  |    |     |
| Assume suitable data if necessary                  |     |  |                  |    |     |
|  |     |  | CO               | KL | M   |
| <b>UNIT-I</b>                                      |     |  |                  |    |     |
| 1.   | a). | Explain the NMOS fabrication steps with neat diagrams.   | 1                | 3  | 7   |
|  | b). | Discuss alternate forms of Pull-up Configurations and derive the relation between pull –up tp pull-down ratio for nMOS inverter. | 1                | 3  | 7   |
| <b>OR</b>  |     |  |                  |    |     |
| 2.   | a). | With neat diagrams explain the process of P-well CMOS Inverter.  | 1                | 3  | 7   |
|  | b). | Compare CMOS, BiCMOS and Bipolar technologies.   | 1                | 3  | 7   |
| <b>UNIT-II</b>                                     |     |  |                  |    |     |
| 3.   | a). | Draw the stick diagrams and layouts for<br>(a) nMOS inverter<br>(b) CMOS inverter<br>3 Input NAND and NOR gates                  | 2                | 3  | 7   |
|  | b). | Explain briefly about Buried contact, Butting contact and Via contact. With neat sketch.   | 2                | 3  | 7   |
| <b>OR</b>  |     |  |                  |    |     |
| 4.   | a). | Sketch $\lambda$ -based design rules for wires, transistors and contacts.  | 2                | 3  | 7   |
|  | b). | Draw the layout diagram for OAI logic using CMOS.  | 2                | 4  | 7   |
| <b>UNIT-III</b>                                    |     |  |                  |    |     |
| 5.   | a). | explain the concept of capacitance in layout design  | 3                | 3  | 7   |
|  | b). | Calculate total on resistance of CMOS inverter where $Z_{PU}/Z_{PD}=4/1$   | 3                | 3  | 7   |
| <b>OR</b>  |     |  |                  |    |     |
| 6.   | a). | Define sheet resistance and Apply the concept to MOS transistors and inverters   | 3                | 3  | 7   |
|  | b). | Explain the concept of Area capacitance of layers with an example  | 3                | 3  | 7   |
| <b>UNIT-IV</b>                                     |     |  |                  |    |     |
| 7.   |     | Draw scaled NMOS transistor and derive all scaling factors for device parameters. Consider Combined V and D scaling model        | 3                | 2  | 14  |

|            |            |   |          |          |          |
|------------|------------|---|----------|----------|----------|
|            |            |   |          |          |          |
|            |            | <b>OR</b>   |          |          |          |
| <b>8.</b>  | <b>a).</b> | Explain about subthreshold currents and current density             | <b>3</b> | <b>2</b> | <b>7</b> |
|            | <b>b).</b> | Explain limitations of scaling.                                     | <b>3</b> | <b>2</b> | <b>7</b> |
|            |            |   |          |          |          |
|            |            | <b>UNIT-V</b>   |          |          |          |
| <b>9.</b>  | <b>a).</b> | Explain CMOS as a ratioed logic                                     | <b>4</b> | <b>2</b> | <b>7</b> |
|            | <b>b).</b> | Distinguish between combinational and sequential switching circuits | <b>4</b> | <b>2</b> | <b>7</b> |
|            |            | <b>OR</b>   |          |          |          |
| <b>10.</b> | <b>a).</b> | Explain charge leakage and charge sharing in dynamic logics.        | <b>4</b> | <b>2</b> | <b>7</b> |
|            | <b>b).</b> | Give a brief explanation about Latches and registers.               | <b>4</b> | <b>2</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20ECOE08                                 |     |   |                  |    |     |
|--|-----|---|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)        |     |   |                  |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER             |     |   |                  |    |     |
| EMBEDDED SYSTEMS & IOT APPLICATIONS (Open Elective-IV) |     |   |                  |    |     |
| (For CE, EEE & ME)                                     |     |   |                  |    |     |
| Time: 3 Hrs.   |     |   | Max. Marks: 70 M |    |     |
| Answer ONE Question from EACH UNIT                     |     |   |                  |    |     |
| All questions carry equal marks                        |     |   |                  |    |     |
| Assume suitable data if necessary                      |     |   |                  |    |     |
|  |     |   | CO               | KL | M   |
| <b>UNIT-I</b>  |     |   |                  |    |     |
| 1.   | a). | Explain the typical Embedded system architecture with relevant diagram?                 | 1                | 2  | 7   |
|  | b). | Illustrate an application-specific Embedded system with suitable examples?              | 1                | 2  | 7   |
| <b>OR</b>  |     |   |                  |    |     |
| 2.   | a). | Explain the characteristics of embedded systems   | 1                | 2  | 7   |
|  | b). | Discuss about Real time clock with respect to an Embedded Hardware?                     | 1                | 2  | 7   |
| <b>UNIT-II</b>   |     |   |                  |    |     |
| 3.   | a). | Explain about serial communication devices and parallel device ports?                   | 2                | 2  | 7   |
|  | b). | Discuss the significance of Watchdog timer in an Embedded System.                       | 2                | 2  | 7   |
| <b>OR</b>  |     |   |                  |    |     |
| 4.   | a). | What is a Device Driver? Explain different types of device drivers and use of them      | 2                | 2  | 7   |
|  | b). | Explain about memory organization in Embedded system                                    | 2                | 2  | 7   |
| <b>UNIT-III</b>  |     |   |                  |    |     |
| 5.   | a). | Draw and explain about Physical Design & Logical Design of IoT                          | 3                | 2  | 7   |
|  | b). | Define IoT and mention different Characteristics of IoT                                 | 3                | 2  | 7   |
| <b>OR</b>  |     |   |                  |    |     |
| 6.   | a). | Differences and Similarities between M2M and IoT.                                       | 3                | 2  | 7   |
|  | b). | Explain in detail about IoT protocols   | 3                | 2  | 7   |
| <b>UNIT-IV</b>   |     |   |                  |    |     |
| 7.   | a). | Name and explain in detail about any two communication concepts                         | 4                | 2  | 7   |
|  | b). | Explain about the following a) Ultrasonic Sensor b) IR Sensor c) Temperature & Humidity | 4                | 2  | 7   |
| <b>OR</b>  |     |   |                  |    |     |
| 8.   |     | Explain the Basic building blocks of an IoT Device & relate it with                     | 4                | 2  | 14  |

|            |            |   |                           |                |           |
|------------|------------|---|---------------------------|----------------|-----------|
|            |            | exemplary device  |                           |                |           |
|            |            |   |                           |                |           |
|            |            | <b>UNIT-V</b>   |                           |                |           |
| <b>9.</b>  | <b>a).</b> | Explain in detail about Web Application Messaging Protocol (WAMP)         | <b>5</b>                  | <b>3</b>       | <b>7</b>  |
|            | <b>b).</b> | Demonstrate the role of Cloud based communication & Data Analytics In IoT | <b>5</b>                  | <b>3</b>       | <b>7</b>  |
|            |            | <b>OR</b>   |                           |                |           |
| <b>10.</b> |            | Analyze IoT Design Methodology with a use case                            | <b>5</b>                  | <b>4</b>       | <b>14</b> |
|            |            | <b>CO-COURSE OUTCOME</b>  | <b>KL-KNOWLEDGE LEVEL</b> | <b>M-MARKS</b> |           |

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks





| Course Code: B20EEOE05                                     |     |   |               |    |     |
|--|-----|---|---------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)            |     |   |               |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER                 |     |   |               |    |     |
| INTRODUCTION TO SENSORS AND TRANSDUCERS (Open Elective-IV) |     |   |               |    |     |
| (For AIDS, CE, CSBS, CSE, ECE, IT & ME)                    |     |   |               |    |     |
| Time: 3 Hrs  |     |   | Max. Marks:70 |    |     |
| Answer ONE Question from EACH UNIT                         |     |   |               |    |     |
| All questions carry equal marks                            |     |   |               |    |     |
| Assume suitable data if necessary                          |     |   |               |    |     |
|  |     |   | CO            | KL | M   |
| <b>UNIT-I</b>  |     |   |               |    |     |
| 1  | a). | Classify Sensors based on their Parameters.   | 1             | 3  | 7   |
|  | b). | Define selectivity and specificity. How are they related?                                     | 1             | 3  | 7   |
| <b>OR</b>  |     |   |               |    |     |
| 2  | a). | Discuss the methods of sensor characterization. How is a sensor electrically characterized?   | 1             | 3  | 7   |
|  | b). | Explain different types of failures possible in a sensor and define the reliability function. | 1             | 3  | 7   |
| <b>UNIT-II</b>   |     |   |               |    |     |
| 3  | a). | Explain Ferromagnetic Plunger Type Transducers with a neat sketch                             | 2             | 3  | 7   |
|  | b). | Summarize the concepts of Photoconductive Cell-The LDR  | 2             | 3  | 7   |
| <b>OR</b>  |     |   |               |    |     |
| 4  | a). | Explain the operation of the Parallel Plate Capacitive Sensor                                 | 2             | 3  | 7   |
|  | b). | Summarize the concepts of Ultrasonic Sensors.   | 2             | 3  | 7   |
| <b>UNIT-III</b>  |     |   |               |    |     |
| 5  | a). | Demonstrate about Acoustic Temperature Sensor in detail                                       | 3             | 3  | 7   |
|  | b). | Explain in detail about Detectors   | 3             | 3  | 7   |
| <b>OR</b>  |     |   |               |    |     |
| 6  | a). | Compute Heat Flux Sensors with a neat sketch  | 3             | 3  | 7   |
|  | b). | Illustrate Spectroscopic Thermometry in detail  | 3             | 3  | 7   |
| <b>UNIT-IV</b>   |     |   |               |    |     |
| 7  | a). | Summarize the concepts of Hall Effect and Sensors   | 4             | 3  | 7   |
|  | b). | Illustrate in detail about Electromagnetic Flowmeter  | 4             | 3  | 7   |
| <b>OR</b>  |     |   |               |    |     |
| 8  | a). | Summarize the concepts of Inductance and Eddy Current Sensors                                 | 4             | 3  | 7   |
|  | b). | Describe in detail Angular/Rotary Movement Transducers  | 4             | 3  | 7   |
| <b>UNIT-V</b>  |     |   |               |    |     |
| 9  | a). | Illustrate the concepts of Film Sensors   | 5             | 3  | 7   |

|           |            |  |          |          |          |
|-----------|------------|--|----------|----------|----------|
|           | <b>b).</b> | <b>Explain</b> the application of Sensors for Environmental Monitoring | <b>5</b> | <b>3</b> | <b>7</b> |
|           |            | <b>OR</b>  |          |          |          |
| <b>10</b> | <b>a).</b> | <b>Explore</b> in detail Semiconductor IC Technology-Standard Methods. | <b>5</b> | <b>3</b> | <b>7</b> |
|           | <b>b).</b> | <b>Explain</b> the application of Sensors for Aerospace.               | <b>5</b> | <b>3</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20ITOE06                          |     |  |                  |    |     |
|---|-----|--|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |     |  |                  |    | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |     |  |                  |    |     |
| MOBILE COMPUTING (Open Elective-IV)             |     |  |                  |    |     |
| (For CE, ECE, EEE & ME)                         |     |  |                  |    |     |
| Time: 3 Hrs.                                    |     |  | Max. Marks: 70 M |    |     |
| Answer ONE Question from EACH UNIT              |     |  |                  |    |     |
| All questions carry equal marks                 |     |  |                  |    |     |
| Assume suitable data if necessary               |     |  |                  |    |     |
|   |     |  | CO               | KL | M   |
| <b>UNIT-I</b>                                   |     |  |                  |    |     |
| 1.  | a). | What are some common applications of wireless networks in today's world? Provide examples.   | 1                | 2  | 7   |
|   | b). | Describe the simplified reference model for wireless networks, including the different layers and their functions.   | 1                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 2.  | a). | Discuss wireless transmission, including frequencies used, types of signals, and characteristics of antennas.  | 1                | 2  | 7   |
|   | b). | Explain modulation techniques used in wireless networks to convert data into radio signals for transmission.   | 1                | 2  | 7   |
| <b>UNIT-II</b>                                  |     |  |                  |    |     |
| 3.  | a). | Describe the concepts of SDMA (Space Division Multiple Access), FDMA (Frequency Division Multiple Access), TDMA (Time Division Multiple Access), and CDMA (Code Division Multiple Access) in wireless communication. | 2                | 2  | 7   |
|   | b). | Discuss the architecture of GSM (Global System for Mobile Communications) including location tracking, call setup, and mobility management.  | 2                | 2  | 7   |
| <b>OR</b>                                       |     |  |                  |    |     |
| 4.  | a). | Explain the concept of international roaming in GSM, including the processes involved in providing mobile services to subscribers when they are abroad.  | 2                | 3  | 7   |
|   | b). | Discuss the call recording functions in GSM, including call setup, call termination, and call routing.   | 2                | 2  | 7   |
| <b>UNIT-III</b>                                 |     |  |                  |    |     |
| 5.  | a). | Compare and contrast infrared and radio transmission in the context of Wireless LAN (WLAN) technologies, including their advantages, limitations, and typical use cases.   | 3                | 2  | 7   |
|   | b). | Discuss the concept of ad hoc network in WLAN, including the formation of independent basic service sets (IBSS) and their applications in peer-to-peer communication.  | 3                | 2  | 7   |

|            |            | <b>OR</b>   |          |          |           |
|------------|------------|---|----------|----------|-----------|
| <b>6.</b>  | <b>a).</b> | Describe the IEEE 802.11 WLAN standards, including 802.11a, 802.11b, 802.11g, 802.11n, 802.11ac, and 802.11ax, highlighting their differences in terms of frequency bands, data rates, and features.                | <b>3</b> | <b>2</b> | <b>7</b>  |
|            | <b>b).</b> | Describe the HIPERLAN (High Performance Radio Local Area Network) standard, including its features, advantages, and applications in high-speed wireless communication.  | <b>3</b> | <b>2</b> | <b>7</b>  |
|            |            | <b>UNIT-IV</b>  |          |          |           |
| <b>7.</b>  | <b>a).</b> | Discuss the Dynamic Host Configuration Protocol (DHCP) in the context of mobile networks, including its role in automatically assigning IP addresses, subnet masks, and other network parameters to mobile devices. | <b>4</b> | <b>2</b> | <b>7</b>  |
|            | <b>b).</b> | Describe the Mobile Transport Layer, including the challenges of reliable communication in mobile networks, and the role of transport layer protocols in overcoming these challenges.                               | <b>4</b> | <b>2</b> | <b>7</b>  |
|            |            | <b>OR</b>   |          |          |           |
| <b>8.</b>  |            | Compare and contrast Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, and other variants of TCP used in mobile networks, including their advantages, limitations, and performance characteristics.          | <b>4</b> | <b>3</b> | <b>14</b> |
|            |            | <b>UNIT-V</b>   |          |          |           |
| <b>9.</b>  | <b>a).</b> | Discuss the role and features of Wireless Datagram Protocol (WDP) in the WAP architecture.  | <b>5</b> | <b>2</b> | <b>7</b>  |
|            | <b>b).</b> | Describe the Wireless Transport Layer Security (WTLS) protocol, including its role in providing secure communication between wireless devices and WAP servers.  | <b>5</b> | <b>2</b> | <b>7</b>  |
|            |            | <b>OR</b>   |          |          |           |
| <b>10.</b> | <b>a).</b> | Discuss the challenges and solutions in developing and deploying wireless applications using WAP technologies.  | <b>5</b> | <b>2</b> | <b>7</b>  |
|            | <b>b).</b> | Discuss WML Scripts, including their syntax, programming constructs, and their role in adding interactivity and dynamic functionality to WAP applications.  | <b>5</b> | <b>2</b> | <b>7</b>  |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

**NOTE :** Questions can be given as A,B splits or as a single Question for 14 marks

| <b>Course Code: B20MEOE10</b>                          |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
|--|--------------|--|-------------------------|--------------|------------|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|------|---|---|---|----------|----------|----------|
| <b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b> |              |  |                         |              | <b>R20</b> |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>IV B.Tech. I Semester MODEL QUESTION PAPER</b>      |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>PROJECT MANAGEMENT (Open Elective-IV)</b>           |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>(For AIDS, CE, CSBS, CSE, ECE, EEE &amp; IT)</b>    |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>Time: 3 Hrs</b>                                     |              |  | <b>Max. Marks: 70 M</b> |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| Answer <b>ONE Question</b> from <b>EACH UNIT</b>       |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| All questions carry equal marks                        |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| Assume suitable data if necessary                      |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
|  |              |  | <b>CO</b>               | <b>KL</b>    | <b>M</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>UNIT-I</b>  |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>1.</b>  | <b>a).</b>   | Elucidate the characteristics of projects.   | <b>1</b>                | <b>2</b>     | <b>7</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
|  | <b>b).</b>   | Elucidate different forms of project management.   | <b>1</b>                | <b>2</b>     | <b>7</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>OR</b>  |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>2.</b>  | <b>a).</b>   | Define and describe the objectives of project management.  | <b>1</b>                | <b>2</b>     | <b>7</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
|  | <b>b).</b>   | Describe in detail the project life cycle.   | <b>1</b>                | <b>2</b>     | <b>7</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>UNIT-II</b>   |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>3.</b>  | <b>a).</b>   | Describe the role of work break down structure in project planning and control.  | <b>2</b>                | <b>2</b>     | <b>7</b>   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
|  | <b>b).</b>   | <p>Given the immediate predecessors and Optimistic time (<math>a</math>), most likely time (<math>m</math>), and pessimistic time (<math>b</math>) for each activity in the table below, compute:</p> <p>a. Mean time and Variance for each activity</p> <p>b. Early start time, Early finish time, Latest start time, and Latest finish time for each activity.</p> <p>c. Total project completion time (<math>T_e</math>) and Variance for the project.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Activity</th> <th>Predecessors</th> <th>a</th> <th>m</th> <th>b</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>—</td> <td>7</td> <td>9</td> <td>11</td> </tr> <tr> <td>B</td> <td>A</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>C</td> <td>A</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>D</td> <td>B</td> <td>2</td> <td>5</td> <td>11</td> </tr> <tr> <td>E</td> <td>C</td> <td>2</td> <td>3</td> <td>4</td> </tr> <tr> <td>F</td> <td>C</td> <td>1</td> <td>4</td> <td>8</td> </tr> <tr> <td>G</td> <td>D, E</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>H</td> <td>F, E</td> <td>2</td> <td>6</td> <td>9</td> </tr> </tbody> </table> | Activity                | Predecessors | a          | m | b | A | — | 7 | 9 | 11 | B | A | 1 | 2 | 3 | C | A | 7 | 8 | 9 | D | B | 2 | 5 | 11 | E | C | 2 | 3 | 4 | F | C | 1 | 4 | 8 | G | D, E | 6 | 7 | 8 | H | F, E | 2 | 6 | 9 | <b>2</b> | <b>3</b> | <b>7</b> |
| Activity   | Predecessors | a  | m                       | b            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| A  | —            | 7  | 9                       | 11           |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| B  | A            | 1  | 2                       | 3            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| C  | A            | 7  | 8                       | 9            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| D  | B            | 2  | 5                       | 11           |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| E  | C            | 2  | 3                       | 4            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| F  | C            | 1  | 4                       | 8            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| G  | D, E         | 6  | 7                       | 8            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| H  | F, E         | 2  | 6                       | 9            |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>OR</b>  |              |  |                         |              |            |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |
| <b>4.</b>  |              | The following table gives information on a project ( $T$ in days, $C$ in Rupees 1000s).  | <b>2</b>                | <b>3</b>     | <b>14</b>  |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |   |   |   |   |      |   |   |   |   |      |   |   |   |          |          |          |

|                          | Activity   | Immediate predecessors   | Normal                    |          | Crash    |                |  |  |  |
|--------------------------|------------|--|---------------------------|----------|----------|----------------|--|--|--|
|                          |            |  | $T_n$                     | $C_n$    | $T_c$    | $C_c$          |  |  |  |
|                          | A          | —  | 6                         | 10       | 2        | 38             |  |  |  |
|                          | B          | —  | 4                         | 12       | 4        | 12             |  |  |  |
|                          | C          | —  | 4                         | 18       | 2        | 36             |  |  |  |
|                          | D          | A  | 6                         | 20       | 2        | 40             |  |  |  |
|                          | E          | B, D   | 3                         | 30       | 2        | 33             |  |  |  |
|                          | F          | C  | 10                        | 10       | 6        | 50             |  |  |  |
|                          | G          | F, E   | 6                         | 20       | 2        | 100            |  |  |  |
| <b>UNIT-III</b>          |            |  |                           |          |          |                |  |  |  |
| <b>5.</b>                | <b>a).</b> | Describe different types of risks and their causes   | <b>3</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Describe various risk identification techniques.   | <b>3</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>OR</b>                |            |  |                           |          |          |                |  |  |  |
| <b>6.</b>                | <b>a).</b> | Elucidate different risk response planning methods.  | <b>3</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Explain the principles of risk management  | <b>3</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>UNIT-IV</b>           |            |  |                           |          |          |                |  |  |  |
| <b>7.</b>                | <b>a).</b> | Present a brief note on different types of meetings for the purpose of project communication | <b>4</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Delineate different types of project evaluations.  | <b>4</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>OR</b>                |            |  |                           |          |          |                |  |  |  |
| <b>8.</b>                | <b>a).</b> | Describe various closeout responsibilities.  | <b>4</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Explain the reasons for terminating the project.   | <b>4</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>UNIT-V</b>            |            |  |                           |          |          |                |  |  |  |
| <b>9.</b>                | <b>a).</b> | Explain the role of project manager and his responsibilities.                                | <b>5</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Present a note on different types of authorities in project management.                      | <b>5</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>OR</b>                |            |  |                           |          |          |                |  |  |  |
| <b>10.</b>               | <b>a).</b> | Explain the process of team building approach.   | <b>5</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
|                          | <b>b).</b> | Write about stress in projects and the way to manage it.                                     | <b>5</b>                  | <b>2</b> | <b>7</b> |                |  |  |  |
| <b>CO-COURSE OUTCOME</b> |            |  | <b>KL-KNOWLEDGE LEVEL</b> |          |          | <b>M-MARKS</b> |  |  |  |

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks

| <b>Course Code: B20MEOE11</b>                          |           |  |                         |           |            |
|--|-----------|--|-------------------------|-----------|------------|
| <b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b> |           |  |                         |           | <b>R20</b> |
| <b>IV B.Tech. I Semester MODEL QUESTION PAPER</b>      |           |  |                         |           |            |
| <b>NANO TECHNOLOGY (Open Elective-IV)</b>              |           |  |                         |           |            |
| <b>(For AIDS, CE, CSBS, CSE, ECE, EEE &amp; IT)</b>    |           |  |                         |           |            |
| <b>Time: 3 Hrs.</b>                                    |           |  | <b>Max. Marks: 70 M</b> |           |            |
| <b>Answer ONE Question from EACH UNIT</b>              |           |  |                         |           |            |
| All questions carry equal marks                        |           |  |                         |           |            |
| Assume suitable data if necessary                      |           |  |                         |           |            |
|  |           |  | <b>CO</b>               | <b>KL</b> | <b>M</b>   |
| <b>UNIT-I</b>  |           |  |                         |           |            |
| <b>1.</b>  | <b>a)</b> | Discuss how the materials change their behavior at nano level?   | <b>1</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | Illustrate crystal symmetries.   | <b>1</b>                | <b>3</b>  | <b>7</b>   |
| <b>OR</b>  |           |  |                         |           |            |
| <b>2.</b>  | <b>a)</b> | Write a short note on classification of nanomaterials.   | <b>1</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | Briefly explain about Anisotropy in a single crystal.  | <b>1</b>                | <b>3</b>  | <b>7</b>   |
| <b>UNIT-II</b>   |           |  |                         |           |            |
| <b>3.</b>  |           | Discuss in detail the optical and electronic properties of metal nanoparticles                                     | <b>2</b>                | <b>3</b>  | <b>14</b>  |
| <b>OR</b>  |           |  |                         |           |            |
| <b>4.</b>  | <b>a)</b> | Briefly discuss the effects of nano scale dimension on Mechanical properties.                                      | <b>2</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | What are the applications of nanomaterials in mechanical engineering? Explain.                                     | <b>2</b>                | <b>3</b>  | <b>7</b>   |
| <b>UNIT-III</b>  |           |  |                         |           |            |
| <b>5.</b>  | <b>a)</b> | Briefly explain the following: (a) Ion implantation and (b) Electron beam lithography.                             | <b>3</b>                | <b>3</b>  | <b>14</b>  |
| <b>OR</b>  |           |  |                         |           |            |
| <b>6.</b>  | <b>a)</b> | Discuss the top down and bottom-up nanofabrication methods with their merits and demerits.                         | <b>3</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | Write a short note on sol-gel method and explain its principle.  | <b>3</b>                | <b>3</b>  | <b>7</b>   |
| <b>UNIT-IV</b>   |           |  |                         |           |            |
| <b>7.</b>  | <b>a)</b> | What is the basic principle in Scanning Electron Microscope? How is it different from optical microscopy? Explain. | <b>4</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | Explain how to characterize a material with scanning electron microscope (SEM) with neat sketch.                   | <b>4</b>                | <b>3</b>  | <b>7</b>   |
| <b>OR</b>  |           |  |                         |           |            |
| <b>8.</b>  | <b>a)</b> | Differentiate SEM and TEM.   | <b>4</b>                | <b>3</b>  | <b>7</b>   |
|  | <b>b)</b> | Illustrate in detail about Raman spectroscopy.   | <b>4</b>                | <b>3</b>  | <b>7</b>   |
| <b>UNIT-V</b>  |           |  |                         |           |            |
| <b>9.</b>  | <b>a)</b> | Discuss briefly about carbon nano tubes and their fields of application.   | <b>5</b>                | <b>3</b>  | <b>7</b>   |

|            |           |  |          |          |          |
|------------|-----------|--|----------|----------|----------|
|            | <b>b)</b> | Discuss in detail about graphene.                                      | <b>5</b> | <b>3</b> | <b>7</b> |
|            |           | <b>OR</b>  |          |          |          |
| <b>10.</b> | <b>a)</b> | Discuss the applications of Nano technology in energy and environment. | <b>5</b> | <b>3</b> | <b>7</b> |
|            | <b>b)</b> | What are the potential effects of nanomaterials to environment?        | <b>5</b> | <b>3</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks





|  |            |  |                         |            |          |
|--|------------|--|-------------------------|------------|----------|
| <b>Course Code: B20MEOE12</b>                          |            |  |                         |            |          |
| <b>SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)</b> |            |  |                         | <b>R20</b> |          |
| <b>IV B. Tech. I Semester MODEL QUESTION PAPER</b>     |            |  |                         |            |          |
| <b>ADDITIVE MANUFACTURING (Open Elective-IV)</b>       |            |  |                         |            |          |
| <b>(For AIDS, CE, CSBS, CSE, ECE, EEE &amp; IT)</b>    |            |  |                         |            |          |
| <b>Time: 3 Hrs.</b>                                    |            |  | <b>Max. Marks: 70 M</b> |            |          |
| Answer <b>ONE Question</b> from <b>EACH UNIT</b>       |            |  |                         |            |          |
| All questions carry equal marks                        |            |  |                         |            |          |
| Assume suitable data if necessary                      |            |  |                         |            |          |
|  |            |  | <b>CO</b>               | <b>KL</b>  | <b>M</b> |
| <b>UNIT-I</b>  |            |  |                         |            |          |
| <b>1.</b>  | <b>a).</b> | Describe the Generic process of CAD to part  | <b>1</b>                | <b>2</b>   | <b>7</b> |
|  | <b>b).</b> | Preparation of CAD model in additive manufacturing.  | <b>1</b>                | <b>2</b>   | <b>7</b> |
| <b>OR</b>  |            |  |                         |            |          |
| <b>2.</b>  | <b>a).</b> | Briefly explain the generalized AM process chain.  | <b>1</b>                | <b>2</b>   | <b>7</b> |
|  | <b>b).</b> | Discuss the file format used in additive manufacturing   | <b>1</b>                | <b>2</b>   | <b>7</b> |
| <b>UNIT-II</b>   |            |  |                         |            |          |
| <b>3.</b>  | <b>a).</b> | Illustrate the working principal of Stereo Lithography apparatus.                                | <b>2</b>                | <b>3</b>   | <b>7</b> |
|  | <b>b).</b> | Explain the path generation in fusion decomposition modeling (FDM).                              | <b>2</b>                | <b>3</b>   | <b>7</b> |
| <b>OR</b>  |            |  |                         |            |          |
| <b>4.</b>  | <b>a).</b> | Explain the limitations and applications of liquid based AM.                                     | <b>2</b>                | <b>3</b>   | <b>7</b> |
|  | <b>b).</b> | List out the applications, advantages and disadvantages of laminated object manufacturing (LOM)? | <b>2</b>                | <b>3</b>   | <b>7</b> |
| <b>UNIT-III</b>  |            |  |                         |            |          |
| <b>5.</b>  | <b>a).</b> | Explain with a neat sketch the working principle of Selective Laser Sintering process.           | <b>3</b>                | <b>3</b>   | <b>7</b> |
|  | <b>b).</b> | Explain the steps involved in post processing technique in AM                                    | <b>3</b>                | <b>3</b>   | <b>7</b> |
| <b>OR</b>  |            |  |                         |            |          |
| <b>6.</b>  | <b>a).</b> | Describe the working principle with benefits and limitations of Electron beam melting            | <b>3</b>                | <b>3</b>   | <b>7</b> |
|  | <b>b).</b> | Explain the techniques used to enhance mechanical properties for AM parts                        | <b>3</b>                | <b>3</b>   | <b>7</b> |
| <b>UNIT-IV</b>   |            |  |                         |            |          |
| <b>7.</b>  | <b>a).</b> | Describe how reverse engineering will be applied to rapid prototyping technique.                 | <b>4</b>                | <b>3</b>   | <b>7</b> |
|  | <b>b).</b> | Discuss various materials available for AM.  | <b>4</b>                | <b>2</b>   | <b>7</b> |
| <b>OR</b>  |            |  |                         |            |          |
| <b>8.</b>  | <b>a).</b> | Explain the steps involved in reverse engineering.   | <b>4</b>                | <b>3</b>   | <b>7</b> |

|            |            |   |          |          |          |
|------------|------------|---|----------|----------|----------|
|            | <b>b).</b> | Explain about ceramic tooling process.  | <b>4</b> | <b>3</b> | <b>7</b> |
|            |            |   |          |          |          |
|            |            | <b>UNIT-V</b>   |          |          |          |
| <b>9.</b>  | <b>a).</b> | Differentiate direct and indirect rapid tooling method.   | <b>5</b> | <b>3</b> | <b>7</b> |
|            | <b>b).</b> | Explain the process of 3D keltool in brief.   | <b>5</b> | <b>3</b> | <b>7</b> |
|            |            | <b>OR</b>   |          |          |          |
| <b>10.</b> | <b>a).</b> | Explain the process of RTVepoxy tooling. Write advantages, disadvantages, and applications of it. | <b>5</b> | <b>3</b> | <b>7</b> |
|            | <b>b).</b> | Write the applications of additive manufacturing in automotive and aerospace industries           | <b>5</b> | <b>2</b> | <b>7</b> |

**CO-COURSE OUTCOME**

**KL-KNOWLEDGE LEVEL**

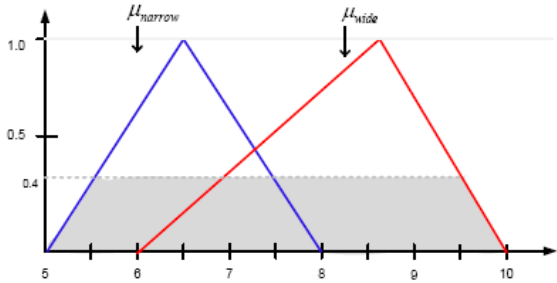
**M-MARKS**

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks



| Course Code: B20BSOE04                          |            |   |                 |          |           |
|---|------------|---|-----------------|----------|-----------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) |            |   |                 |          |           |
| IV B.Tech. I Semester MODEL QUESTION PAPER      |            |   |                 |          |           |
| FUZZY SETS AND FUZZY LOGIC (Open Elective-IV)   |            |   |                 |          |           |
| (For AIDS, CE, CSBS, CSE, ECE, EEE, IT & ME)    |            |   |                 |          |           |
| TIME: 3Hrs                                      |            |   | Max. Marks: 70M |          |           |
| Answer ONE Question from EACH UNIT              |            |   |                 |          |           |
| All questions carry equal marks                 |            |   |                 |          |           |
| Assume suitable data if necessary               |            |   |                 |          |           |
|   |            |   | CO              | KL       | M         |
| <b>UNIT-I</b>                                   |            |   |                 |          |           |
| <b>1</b>  | <b>a).</b> | Develop a reasonable membership function for the following fuzzy sets based on height measured in centimeters: (i) “tall” (ii) “short” (iii) “not short”  | <b>1</b>        | <b>3</b> | <b>7</b>  |
|   | <b>b).</b> | Develop the fuzzy membership functions for each of the following<br>(i) Person X is considerably heavier than 100 pounds<br>(ii) Car Z costs approximately \$30,000<br>(iii) $\mu_A(x) = 0$ for $x \leq 5$ and $1-(x-5)^2$ when $x > 5$   | <b>1</b>        | <b>3</b> | <b>7</b>  |
| <b>OR</b>                                       |            |   |                 |          |           |
| <b>2</b>  |            | We want to compare two sensors based upon their detection levels and gains setting for a universe of discourse of gain settings $X = \{0, 20, 40, 60, 80, 100\}$ , the sensor detection levels for the monitoring of a standard item provides typical membership functions to represent the detection levels for each of the sensors; these are given below in standard discrete form<br>$S1 = \left\{ \frac{0}{0} + \frac{0.5}{20} + \frac{0.65}{40} + \frac{0.85}{60} + \frac{1}{80} + \frac{1}{100} \right\} \quad S2 = \left\{ \frac{0}{0} + \frac{0.45}{20} + \frac{0.6}{40} + \frac{0.8}{60} + \frac{0.95}{80} + \frac{1}{100} \right\}$ Find the following membership functions using standard fuzzy operations<br>(i) $\mu_{S1 \cup S2}(x)$ (ii) $\mu_{S1 \cap S2}(x)$ (iii) $\mu_{\bar{S1} \cup S1}(x)$ (iv) $\mu_{\bar{S1} \cap S2}(x)$ (v) $\mu_{S1 \cap \bar{S2}}(x)$ | <b>1</b>        | <b>3</b> | <b>14</b> |
| <b>UNIT-II</b>                                  |            |   |                 |          |           |
| <b>3</b>  |            | In the field of computer networking there is an imprecise relationship between the level of use of a network communication bandwidth and the latency experienced in peer-to-peer communications. Let X be the fuzzy set of use levels (in terms of percentage of full bandwidth used) and Y be a fuzzy set of latencies (in milliseconds) with the following membership functions:<br>find the Cartesian product represented by $R = X \times Y$ .  | <b>2</b>        | <b>3</b> | <b>14</b> |

|                 |     |  |   |   |   |
|-----------------|-----|--|---|---|---|
|                 |     | $X = \left\{ \frac{0.2}{10} + \frac{0.5}{20} + \frac{0.8}{40} + \frac{1}{60} + \frac{0.6}{80} + \frac{0.1}{100} \right\}$ $Y = \left\{ \frac{0.3}{0.5} + \frac{0.6}{1} + \frac{0.9}{1.5} + \frac{1}{4} + \frac{0.6}{8} + \frac{0.3}{20} \right\}$ <p>Now, suppose we have a second fuzzy bandwidth usage <math>Z = \left\{ \frac{0.3}{10} + \frac{0.6}{20} + \frac{0.7}{40} + \frac{0.9}{60} + \frac{1}{80} + \frac{0.5}{100} \right\}</math> set of given by</p> <p>Find <math>S = Z \circ R</math> using max-min composition.</p>  |   |   |   |
| <b>OR</b>       |     |  |   |   |   |
| 4               | a). | <p>In a computer engineering different logic families are often compared on the basis of their power-delay product. The fuzzy set F is the logic families <math>F = \{NMOS, CMOS, TTL, ECL, JJ\}</math>. The range of delay time <math>D = \{0.1, 1, 10, 100\}</math> in Nano seconds. The power dissipation in micro watts <math>P = \{0.01, 0.1, 1, 10, 100\}</math>. and the fuzzy relations <math>R_1 (D \times F)</math> and <math>R_2 (F \times P)</math> are as given below:</p> $R_1 = \begin{array}{c ccccc} & N & C & T & E & J \\ \hline 0.1 & 0 & 0 & 0 & .6 & 1 \\ 1 & 0 & .1 & .5 & 1 & 0 \\ 10 & .4 & 1 & 1 & 0 & 0 \\ 100 & 1 & .2 & 0 & 0 & 0 \end{array}$ <p style="text-align: center;">and</p> $R_2 = \begin{array}{c ccccc} & .01 & .1 & 1 & 10 & 100 \\ \hline N & 0 & .4 & 1 & .3 & 0 \\ C & .2 & 1 & 0 & 0 & 0 \\ T & 0 & 0 & .7 & 1 & 0 \\ E & 0 & 0 & 0 & 1 & .5 \\ J & 1 & .1 & 0 & 0 & 0 \end{array}$ <p>By using max-min composition, obtain a fuzzy relation between delay time and power dissipation.</p> | 2 | 3 | 7 |
|                 | b). | <p>Let R be a fuzzy relation defined on the set of cities representing the concept 'very near'. Discuss the properties of fuzzy equivalence relation.</p>  | 2 | 3 | 7 |
| <b>UNIT-III</b> |     |  |   |   |   |
| 5               | a). | <p>The following are the fuzzified outputs of three fired rules:</p> <p>Find the crisp output from the union of fuzzified outputs by using any one of the defuzzification methods.</p>   | 3 | 3 | 7 |
|                 | b). | <p>Explain centroid method for defuzzification.</p>  | 4 | 3 | 7 |
| <b>OR</b>       |     |  |   |   |   |
| 6               | a). | <p>Suppose a fuzzy set young is defined as follows <math>young = \{(15,0.5), (20,0.8), (25,0.8), (30,0.5), (35,0.3)\}</math>. Find the crisp value of young using mean of maxima method</p>  | 3 | 3 | 7 |

|                |   |   |   |    |
|----------------|---|---|---|----|
|                | <p>b). The width of a road as narrow and wide is defined by two fuzzy sets, whose membership functions are plotted as shown below. If a road with its degree of membership value is 0.4 then what will be its width (in crisp) measure.</p>   | 4 | 3 | 7  |
| <b>UNIT-IV</b> |   |   |   |    |
| 7              | a). Construct a truth table for $(p \rightarrow r) \wedge (q \rightarrow r) \vee (\sim p \wedge q)$   | 5 | 3 | 7  |
|                | b). Write the symbolic form of the following statement "you cannot ride the roller coaster if you are under 4 feet tall unless you are older than 16 years old"   | 5 | 3 | 7  |
| <b>OR</b>      |   |   |   |    |
| 8              | <p>Given P : Bob is brilliant ; T(P) = 0.8; Q : John is brilliant; T(Q) = 0.6;<br/>         Find the truth values of the following fuzzy propositions<br/>         (i) Bob is not brilliant<br/>         (ii) Bob is brilliant and so is John<br/>         (iii) Either Bob or John is brilliant<br/>         (iv) if Bob is brilliant then so is John<br/>         (v) Bob is brilliant if and only if John is brilliant</p>   | 5 | 3 | 14 |
| <b>UNIT-V</b>  |   |   |   |    |
| 9              | Explain in detail any one application of Fuzzy Logic Controller   | 6 | 3 | 14 |
| <b>OR</b>      |   |   |   |    |
| 10             | <p>Explain how would you design a washing machine to have fuzzy inference in a real world environment. In your discussion include the following factors<br/>         (i) A practical choice of the fuzzy input &amp; output variables<br/>         (ii) A practical no. of quantizations and choice of linguistic labels<br/>         (iii) Draw and indicate a reasonable membership functions for each fuzzy variable.<br/>         (iv) Indicate practical values of universe of discourse<br/>         (v) Three examples of rules<br/>         (vi) The most practical approach of defuzzification technique</p> | 6 | 3 | 14 |

CO-COURSE OUTCOME

KL-KNOWLEDGE LEVEL

M-MARKS

NOTE : Questions can be given as A,B splits or as a single Question for 14 marks