

| Course Code: B20AD0E04 | | | | | |
|-------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| MACHINE LEARNING (Open Elective-III) | | | | | |
| (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 |
| UNIT-I | | | | | |
| 1. | a). | Explain about Types of Machine Learning Systems? | 1 | 2 | 8 |
| | b). | Illustrate the following: 1) Artificial Intelligence 2) Machine Learning 3) Deep learning | 1 | 2 | 6 |
| OR | | | | | |
| 2. | a). | Differentiate between Supervised and Unsupervised Learning? | 1 | 3 | 7 |
| | b). | Write about Sampling distribution of an estimator? | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Discuss about various steps to construct the decision tree model. | 2 | 2 | 7 |
| | b). | Elaborate Naive Bayes probabilistic model for categorical data with an example? | 2 | 3 | 7 |
| OR | | | | | |
| 4. | a). | Explain types of Regression? | 2 | 2 | 7 |
| | b). | Differentiate between the One-Versus-One and One-versus-Rest methods for multi class classification using binary classification? | 2 | 3 | 7 |
| UNIT-III | | | | | |
| 5. | a). | Write about Ensemble Learning. Justify bagging with Random Forest algorithm with an example? | 3 | 3 | 7 |
| | b). | Write about Voting Classifiers? | 3 | 2 | 7 |
| OR | | | | | |
| 6. | | Explain how Support Vector Machine can be used for classification of linearly separable data? | 3 | 3 | 14 |
| UNIT-IV | | | | | |
| 7. | a). | Write about K-Means algorithm with an example? | 4 | 3 | 7 |
| | b). | Write about Clustering for Semi-Supervised Learning? | 4 | 2 | 7 |
| OR | | | | | |
| 8. | a). | What is meant by Dimensionality reduction? Apply PCA to reduce the dimensionality reduction. | 4 | 3 | 7 |

| | | | | | |
|------------|------------|--------------------------------------------------------------------------|---------------------------|----------------|-----------|
| | b). | Explain the concept of learning hidden layer representations | 4 | 2 | 7 |
| | | | | | |
| | | UNIT-V | | | |
| 9. | | Explain in detail about Implementation of MLP with Keras. | 5 | 2 | 14 |
| | | OR | | | |
| 10. | | Explain in detail about Loading and Preprocessing Data with Tensor Flow. | 5 | 2 | 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



| Course Code: B20CEO05 | | | | | |
|-------------------------------------------------|----|-----------------------------------------------------------------------------------|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| ALTERNATIVE ENERGY SOURCES (Open Elective-III) | | | | | |
| (For AIDS, CSBS, CSE, ECE & IT) | | | | | |
| 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 |
| UNIT-I | | | | | |
| 1. | a) | Explain the need for development of renewable energy sources. | 1 | 2 | 7 |
| | b) | Explain in detail the scarcity of conventional energy sources in global scenario. | 1 | 2 | 7 |
| OR | | | | | |
| 2. | a) | Explain hybrid systems in detail. | 1 | 2 | 7 |
| | b) | Explain the reduction potential of carbon dioxide gas. | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a) | Explain solar heating and cooling processes with a neat sketch. | 2 | 2 | 7 |
| | b) | Explain the measurement and estimation of solar radiation. | 2 | 2 | 7 |
| OR | | | | | |
| 4. | a) | Explain solar photovoltaic conversion processes | 2 | 2 | 7 |
| | b) | Explain the applications of solar energy conversion processes. | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5. | a) | Derive the expression for power generation from wind turbine using Betz model. | 3 | 2 | 7 |
| | b) | List and explain various types of winds and factors influencing wind generation. | 3 | 2 | 7 |
| OR | | | | | |
| 6. | a) | Explain the design aspects of windmill. | 3 | 2 | 7 |
| | b) | Explain the concepts of energy wheeling and energy banking concepts. | 3 | 2 | 7 |
| UNIT-IV | | | | | |
| 7. | a) | Explain how biomass is converted by gasification process. | 4 | 2 | 7 |
| | b) | Explain how biomass is converted by gasification process. | 4 | 2 | 7 |
| OR | | | | | |

| | | | | | |
|---------------|----|------------------------------------------------------------------------------------------------------|---|---|---|
| 8. | a) | Explain how urban waste is collected and converted into energy. | 4 | 2 | 7 |
| | b) | Explain how biomass is converted by pyrolysis and liquefaction processes. | 4 | 2 | 7 |
| UNIT-V | | | | | |
| 9. | a) | Explain the theory and working principle of ocean thermal energy conversion (OTEC) system. | 5 | 2 | 7 |
| | b) | Explain with a neat sketch, the operation of geothermal power plant. | 5 | 2 | 7 |
| OR | | | | | |
| 10. | a) | Explain with a neat sketch, the working and operation of any turbine used for hydropower generation. | 5 | 2 | 7 |
| | b) | Explain the tidal energy conversion process with a neat sketch | 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: B20CBOE04 | | | | | |
| SAGIRAMAKRISHNAMRAJUENGINEERINGCOLLEGE(A) | | | | R20 | |
| IV B.Tech I Semester MODEL QUESTION PAPER | | | | | |
| HUMAN RESOURCE MANAGEMENT (Open Elective-III) | | | | | |
| (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 |
| UNIT-I | | | | | |
| 1. | Define Human Resource Management. Explain the important functions of HR Manager. | | 1 | 2 | 14 |
| OR | | | | | |
| 2 | Discuss in detail about Strategic Human Resource Management | | 1 | 2 | 14 |
| UNIT-II | | | | | |
| 3. | Define Recruitment? Explain the sources of recruitment and factors influencing the recruitment | | 2 | 3 | 14 |
| OR | | | | | |
| 4. | Define Job Analysis, Job description and Job evaluation. Explain about the Merit Rating Method in detail | | 2 | 3 | 14 |
| UNIT-III | | | | | |
| 5. | Compare and Contrast different techniques of Performance appraisal | | 3 | 3 | 14 |
| OR | | | | | |
| 6. | Discuss in detail about the Promotion and Transfer | | 3 | 3 | 14 |
| UNIT-IV | | | | | |
| 7 | Explain briefly about the training methods | | 4 | 2 | 14 |
| OR | | | | | |
| 8 | Discuss in detail about the Career Development Planning | | 4 | 2 | 14 |
| UNIT-V | | | | | |
| 9. | How to manage Cross Cultural Issues? Explain in detail | | 5 | 3 | 14 |
| OR | | | | | |
| 10. | Discuss the HR issues like employee turnover, training and development and Wage and salary administration in the Global context. | | 5 | 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

IV B.Tech I Semester MODEL QUESTION PAPER

OPERATING SYSTEMS (Open Elective-III)

(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 |
|----------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|----------|
| | | UNIT-I | | | |
| 1 | a) | Explain the abstract view of system components. | 1 | 2 | 7 |
| | b) | Discuss the Simple Operating System Structure. | 1 | 2 | 7 |
| | | OR | | | |
| 2 | a) | Explain different types of Operating Systems. | 1 | 2 | 7 |
| | b) | Define a System call. Explain the various types of system calls provided by Operating System. | 1 | 2 | 7 |
| | | UNIT-II | | | |
| 3 | a) | Differentiate one- to- one, many- to-one multi-threading models. | 2 | 2 | 7 |
| | b) | Explain Dining Philosophers problem? Discuss the solution to Dining Philosopher's problem using monitors. | 2 | 2 | 7 |
| | | OR | | | |
| 4 | a) | Explain Primitive Priority Scheduling Algorithms with an Example? | 2 | 2 | 7 |
| | b) | Discuss the solution to Reader/Writers Problem using semaphores. | 2 | 2 | 7 |
| | | UNIT-III | | | |
| 5 | a) | Differentiate paging and segmentation. | 3 | 2 | 7 |
| | b) | Explain briefly the performance of Demand paging with an example. | 3 | 2 | 7 |
| | | OR | | | |
| 6 | a) | Define Page Fault. When does a page fault occur? Describe the action taken by OS when page fault occurs. | 3 | 2 | 7 |
| | b) | Apply FIFO and LRU page replacement algorithms for the following string to determine the number of page faults. 7 0 1 2 0 3 0 4 2 3 0 2 1 2 0 1 7 0 1 for a memory with '3' frames. | 3 | 3 | 7 |
| | | UNIT-IV | | | |
| 7 | a) | Apply the deadlock detection algorithm to determine deadlock will exist or not for the following system with 5 process and 3 resource types (resource type A has 7 instances, B has 2 instances, and C has 6 instances) Snapshot at | 4 | 3 | 7 |

| | | time T0 | | | | | | | | | | | |
|---------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---|---|---------|---|---|-----------|---|----------|----------|----------|
| | | Process | Allocation | | | Request | | | Available | | | | |
| | | | A | B | C | A | B | C | A | B | C | | |
| | | P0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | P1 | 2 | 0 | 0 | 2 | 0 | 2 | | | | | |
| | | P2 | 3 | 0 | 3 | 0 | 0 | 0 | | | | | |
| | | P3 | 2 | 1 | 1 | 1 | 0 | 0 | | | | | |
| | | P4 | 0 | 0 | 2 | 0 | 0 | 2 | | | | | |
| | b) | Explain how do we prevent dead lock with an example | | | | | | | | | 4 | 2 | 7 |
| OR | | | | | | | | | | | | | |
| 8 | a) | Explain deadlock avoidance using banker's algorithm with suitable example. | | | | | | | | | 4 | 2 | 7 |
| | b) | Apply FCFS, SSTF disk arm scheduling schemes to find total number head movements for the following string 98 183 37 122 14 124 65 67 assume the head pointer at 53. | | | | | | | | | 4 | 3 | 7 |
| UNIT-V | | | | | | | | | | | | | |
| 9 | a) | Explain System and Network Threats | | | | | | | | | 5 | 2 | 7 |
| | b) | Explain different methods used to solve the problem of security at the operating system level. | | | | | | | | | 5 | 2 | 7 |
| OR | | | | | | | | | | | | | |
| 10 | a) | Explain Principles and domain Protections. | | | | | | | | | 5 | 2 | 7 |
| | b) | Explain the access matrix structure employed in protection domain? | | | | | | | | | 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

IV B.Tech I Semester MODEL QUESTION PAPER

MACHINE LEARNING (Open Elective-III)

(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 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| UNIT-I | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | a) | Explain about Types of Machine Learning Systems? | 1 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b) | Demonstrate about curse of Dimensionality and Overfitting. | 1 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | a) | List out & explain the models in the output of Machine Learning. | 1 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b) | Differentiate between Prior Probability and Conditional Probability. | 1 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNIT-II | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | a) | Demonstrate least-squares method using least square regression for classification. | 2 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b) | Demonstrate Nearest Neighbor Classification with suitable example. | 2 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | a) | Develop Decision trees for following set of training examples | 2 | 3 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>Day</th> <th>Outlook</th> <th>Temperature</th> <th>Humidity</th> <th>Wind</th> <th>Play Tennis</th> </tr> </thead> <tbody> <tr><td>D1</td><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr> <tr><td>D2</td><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr> <tr><td>D3</td><td>Overcast</td><td>Hot</td><td>High</td><td>Weak</td><td>Yes</td></tr> <tr><td>D4</td><td>Rain</td><td>Mild</td><td>High</td><td>Weak</td><td>Yes</td></tr> <tr><td>D5</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr> <tr><td>D6</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Strong</td><td>No</td></tr> <tr><td>D7</td><td>Overcast</td><td>Cool</td><td>Normal</td><td>Strong</td><td>Yes</td></tr> <tr><td>D8</td><td>Sunny</td><td>Mild</td><td>High</td><td>Weak</td><td>No</td></tr> <tr><td>D9</td><td>Sunny</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr> <tr><td>D10</td><td>Rain</td><td>Mild</td><td>Normal</td><td>Weak</td><td>Yes</td></tr> <tr><td>D11</td><td>Sunny</td><td>Mild</td><td>Normal</td><td>Strong</td><td>Yes</td></tr> <tr><td>D12</td><td>Overcast</td><td>Mild</td><td>High</td><td>Strong</td><td>Yes</td></tr> <tr><td>D13</td><td>Overcast</td><td>Hot</td><td>Normal</td><td>Weak</td><td>Yes</td></tr> <tr><td>D14</td><td>Rain</td><td>Mild</td><td>High</td><td>Strong</td><td>No</td></tr> </tbody> </table> | | | | Day | Outlook | Temperature | Humidity | Wind | Play Tennis | D1 | Sunny | Hot | High | Weak | No | D2 | Sunny | Hot | High | Strong | No | D3 | Overcast | Hot | High | Weak | Yes | D4 | Rain | Mild | High | Weak | Yes | D5 | Rain | Cool | Normal | Weak | Yes | D6 | Rain | Cool | Normal | Strong | No | D7 | Overcast | Cool | Normal | Strong | Yes | D8 | Sunny | Mild | High | Weak | No | D9 | Sunny | Cool | Normal | Weak | Yes | D10 | Rain | Mild | Normal | Weak | Yes | D11 | Sunny | Mild | Normal | Strong | Yes | D12 | Overcast | Mild | High | Strong | Yes | D13 | Overcast | Hot | Normal | Weak | Yes | D14 | Rain | Mild | High | Strong | No |
| Day | Outlook | Temperature | | | | Humidity | Wind | Play Tennis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D1 | Sunny | Hot | | | | High | Weak | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D2 | Sunny | Hot | | | | High | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D3 | Overcast | Hot | | | | High | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D4 | Rain | Mild | | | | High | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D5 | Rain | Cool | | | | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D6 | Rain | Cool | | | | Normal | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D7 | Overcast | Cool | | | | Normal | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D8 | Sunny | Mild | | | | High | Weak | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D9 | Sunny | Cool | | | | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D10 | Rain | Mild | | | | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D11 | Sunny | Mild | | | | Normal | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D12 | Overcast | Mild | High | Strong | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D13 | Overcast | Hot | Normal | Weak | Yes | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D14 | Rain | Mild | High | Strong | No | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b) | Explain distance based clustering. | 2 | 2 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNIT-III | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | |
|-----------|-----------|--------------------------------------------------------------------------------|----------|----------|----------|
| 5 | a) | Explain Feature construction and selection. | 3 | 2 | 7 |
| | b) | Compare Bagging and random forests. | 3 | 2 | 7 |
| | | OR | | | |
| 6 | a) | Explain how thresholding and discretisation is done in feature transformations | 3 | 2 | 7 |
| | b) | Demonstrate Adaboost. | 3 | 2 | 7 |
| | | UNIT-IV | | | |
| 7 | a) | Summarize Principle Component Analysis. | 4 | 2 | 7 |
| | b) | Demonstrate the grid search process in Model Evaluation and Optimization | 4 | 2 | 7 |
| | | OR | | | |
| 8 | a) | Compare Model Evaluation Techniques. | 4 | 2 | 7 |
| | b) | Demonstrate the Regularization Process | 4 | 2 | 7 |
| | | UNIT-V | | | |
| 9 | a) | Explain back propagation in Neural Network with suitable Example. | 5 | 2 | 7 |
| | b) | Explain Markov Decision Process. | 5 | 2 | 7 |
| | | OR | | | |
| 10 | a) | Compare multilayer perceptrons with respect to linear perceptron. | 5 | 2 | 7 |
| | b) | Outline the uses of Reinforcement Learning. | 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

IV B.Tech I Semester MODEL QUESTION PAPER

DATA SCIENCE (Open Elective-III)

(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 |
|-----------------|-----|-----------------------------------------------------------------|----|----|---|
| UNIT-I | | | | | |
| 1 | a). | Compare Tuples and Dictionaries | 1 | 2 | 7 |
| | b). | Explain about Control Flow. | 1 | 2 | 7 |
| OR | | | | | |
| 2 | a). | Explain about Object-Oriented Programming. | 1 | 2 | 7 |
| | b). | Discuss in detail about Automated Testing and assert. | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3 | a). | Discuss in detail about matplotlib. | 2 | 2 | 7 |
| | b). | Compare Bar Charts and Line Charts. | 2 | 2 | 7 |
| OR | | | | | |
| 4 | a). | Explain about Linear Algebra. | 2 | 2 | 7 |
| | b). | Describe a Single Set of Data. | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5 | a). | Elaborate the Idea Behind Gradient Descent. | 3 | 2 | 7 |
| | b). | Explain about Choosing the Right Step Size in Gradient Descent. | 3 | 2 | 7 |
| OR | | | | | |
| 6 | a). | Explain in detail about the Stochastic Gradient Descent. | 3 | 2 | 7 |
| | b). | Describe the Minibatch Gradient Descent. | 3 | 2 | 7 |
| UNIT-IV | | | | | |
| 7 | a). | Discuss in detail about the stdin and stdout. | 4 | 2 | 7 |
| | b). | Explain about Scraping the Web with suitable Example. | 4 | 2 | 7 |
| OR | | | | | |
| 8 | a). | Explain about Cleaning and Munging with example. | 4 | 2 | 7 |
| | b). | Explain the Dimensionality Reduction. | 4 | 2 | 7 |

| | | UNIT-V | | | |
|-----------|------------|-----------------------------------------------------|---------------------------|----------------|----------|
| 9 | a). | Explain about the Overfitting and Underfitting. | 5 | 2 | 7 |
| | b). | Discuss about the Feature Extraction and Selection. | 5 | 2 | 7 |
| | | OR | | | |
| 10 | a). | Describe the Simple Linear Regression. | 5 | 2 | 7 |
| | b). | Explain in detail about the k-Nearest Neighbors | 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: B20ECOE05 | | | | | |
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech I Semester MODEL QUESTION PAPER | | | | | |
| DIGITAL SIGNAL PROCESSING (Open Elective-III) | | | | | |
| (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 |
| UNIT-I | | | | | |
| 1. | a). | Find the Z-transform of the signal $x_n = 2^n u(n) - 3^n u(n-1)$ and its region of convergence | 1 | 2 | 7 |
| | b). | Realise the series & parallel canonical realizations of the following digital transfer function $X(Z) = z^2 + 2z + 4 / (z-8)(z^2 - 0.9z + 0.14)$ | 1 | 2 | 7 |
| OR | | | | | |
| 2. | a). | Compute the response of the system $y_n = 0.7y_{n-1} - 0.12y_{n-2} + x_{n-1} + x_{n-2}$ to the input $x_n = u(n)$. Discuss the stability of the above DT system? | 1 | 2 | 7 |
| | b). | Find the inverse Z transform of $X_z = \frac{z^2}{z^2 - 2rz \cos \theta + r^2}$ | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Compute the DFT of the following sequence using Radix-2 DIT FFT flow graph. Show the all intermediate stage results: $x_n = \{0, 1, 2, 0, -2, -1, 0, 0\}$ | 2 | 2 | 7 |
| | b). | Find the DFT of the sequence $x(n) = \{3, 2, 5, 4\}$, Using this result, find the DFT of $\{25, 20, 15, 10\}$. State the property of DFT used? | 2 | 2 | 7 |
| OR | | | | | |
| 4. | a). | Obtain the circular convolution of the two sequences given below using DFT method $x_1[n] = 1, -2, 3, 1$, $x_2[n] = 2, 3, 0, -4$ | 2 | 2 | 7 |
| | b). | Compare in place computation and natural input-natural output computation methods. Discuss the computational complexities involved in direct DFT and FFT. | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5 | a). | Design a linear-phase low pass FIR digital filter to meet the following specifications: (i) Pass band = 0 to 10 kHz (ii) Sampling frequency = 100 kHz (iii) Filter order = 10. Compute the impulse response of the | 3 | 2 | 7 |

| | | | | | |
|-----|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|
| | | desired FIR digital filter using Hamming window | | | |
| | b). | What is Gibb's phenomenon? Discuss the selection criteria of windows with respect to FIR filter design | 3 | 3 | 7 |
| | | OR | | | |
| 6. | a). | explain about constant group delay and phase delay provided by FIR filters? | 3 | 2 | 7 |
| | b). | Design a lowpass FIR filter using Hamming window function with 7 samples and with cut-off frequency of 0.35π rad. Find the digital filter transfer function. | 3 | 3 | 7 |
| | | UNIT-IV | | | |
| 7. | a). | Explain how Sub band coding of speech signals reduces the bit rate. | 4 | 3 | 7 |
| | b). | Discuss about DTMF signaling | 4 | 2 | 7 |
| | | OR | | | |
| 8. | a). | Explain Spectral analysis of sinusoidal signals using FFT? | 4 | 2 | 14 |
| | | UNIT-V | | | |
| 9. | a). | Illustrate the operation of up-sampler, down-sampler with block diagrams. | 5 | 2 | 14 |
| | | OR | | | |
| 10. | a). | Illustrate the operation of Interpolator and Decimator with block diagrams. | 5 | 2 | 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

| | | | | | |
|--------------------------------------------------------|------------|----------------------------------------------------------------------------------------------|-------------------------|------------|-----------|
| Code: B20ECOE06 | | | | | |
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | R20 | |
| IV B.Tech I Semester MODEL QUESTION PAPER | | | | | |
| IMAGE PROCESSING (Open Elective-III) | | | | | |
| (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 |
| UNIT-I | | | | | |
| 1. | a). | Define adjacency in digital image and discuss various adjacencies available. | 1 | 2 | 7 |
| | b). | Mention any four fields that use digital image processing. | 1 | 2 | 7 |
| OR | | | | | |
| 2. | | Explain the fundamental steps of digital image processing. | 1 | 2 | 14 |
| UNIT-II | | | | | |
| 3. | a). | Discuss about the histogram specification algorithm in detail. | 2 | 2 | 7 |
| | b). | Explain the averaging spatial filtering with the help of an example. | 2 | 3 | 7 |
| OR | | | | | |
| 4. | a). | With the help of a block diagram explain basic steps involved in frequency domain filtering. | 2 | 2 | 7 |
| | b). | Discuss about the Butter worth low pass filtering. | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5. | a). | What are the derivative operators useful in image segmentation? explain | 3 | 2 | 7 |
| | b). | Explain about Region Splitting and Merging with an example | 3 | 3 | 7 |
| OR | | | | | |
| 6. | a). | Explain about wavelet-based image processing. | 3 | 2 | 7 |
| | b). | Discuss the main steps involved in Continuous Wavelet Transform. | 3 | 3 | 7 |
| UNIT-IV | | | | | |
| 7. | a). | Explain about lossless predictive coding. | 4 | 3 | 7 |
| | b). | Explain Arithmetic encoding with an example. | 4 | 3 | 7 |
| OR | | | | | |
| 8. | a). | Explain about image compression models. | 4 | 3 | 7 |

| | | | | | |
|------------|------------|------------------------------------------------------------------|---------------------------|----------------|----------|
| | b). | Discuss about the lossy predictive coding | 4 | 2 | 7 |
| | | | | | |
| | | UNIT-V | | | |
| 9. | a). | Discuss inverse filtering and how we can improve its performance | 4 | 3 | 7 |
| | b). | Explain the process of image restoration in presence of noise. | 4 | 2 | 7 |
| | | OR | | | |
| 10. | a). | Explain about opening and closing morphological operators. | 4 | 3 | 7 |
| | b). | Describe the Hit or miss transformation algorithm in detail. | 4 | 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



| | | | | | |
|---------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------|------------|
| Course Code: B20EEOE02 | | | | | |
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech I Semester MODEL QUESTION PAPER | | | | | |
| MATLAB PROGRAMING FOR ENGINEERING APPLICATIONS (Open Elective-III) | | | | | |
| (For AIDS, CE, CSBS, CSE, 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 |
| UNIT-I | | | | | |
| 1. | a). | Explain the vectors, matrices, and its conversions procedures with an example using MATLAB. | 1 | 3 | 7 |
| | b). | Explain the different data types in MATLAB? How are they represented in MATLAB programming? | 1 | 3 | 7 |
| OR | | | | | |
| 2. | a). | Explain the line plots, subplots, bar plots, surface plots with suitable examples. | 1 | 3 | 7 |
| | b). | Consider three matrices given as follows: $\text{MatA} = \begin{bmatrix} 4 & 7 & 1 \\ 7 & 2 & 3 \\ 5 & 5 & 9 \end{bmatrix}; \text{MatB} = \begin{bmatrix} 6 & 0 & 4 \\ 9 & 8 & 1 \\ 7 & 5 & 2 \end{bmatrix}; \text{MatC} = \begin{bmatrix} 2 & 5 & 3 \\ 0 & 17 & 9 \\ 8 & 0 & 1 \end{bmatrix}$ Write a MATLAB program to find the following: (a) MatA + MatB, (b) MatB – MatC, (c) MatA *MatC, (d) Determinant of MatC. | 1 | 3 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Explain the different types of conditional statements with an example. | 2 | 4 | 7 |
| | b). | For the arrays x and y given below, use the MATLAB program to obtain all the elements in x that are greater than the corresponding elements in y. x = [-3, 0, 0, 2, 6, 8], y = [-5, -2, 0, 3, 4, 10] | 2 | 3 | 7 |
| OR | | | | | |
| 4. | a). | Explain the different loop control statements with suitable example. | 2 | 3 | 7 |
| | b). | Write a program using FOR loop to evaluate the equation $y(x) = x^2 - 3x + 2$ for all values of x between -1 and 3, with increment of 0.1. | 2 | 4 | 7 |
| UNIT-III | | | | | |
| 5. | a). | Explain the terms Mean, Standard Deviation, Median and Mode with MATLAB syntax. | 3 | 3 | 7 |
| | b). | Illustrate the difference between the rand (), randn(), and randi() | 3 | 4 | 7 |

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|-----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|
| | | functions? and explain with examples. | | | |
| | | OR | | | |
| 6. | | Write a program to Compute the (a) P (4), (b) P' (4), for a given expression $P(x) = -0.02x^3 + 0.1x^2 - 0.2x + 1.66$, which passes through the four points (1, 1.54), (2, 1.5), (3, 1.42), and (5, 0.66). | 3 | 3 | 14 |
| | | | | | |
| | | UNIT-IV | | | |
| 7. | a). | Write a program to find the rank of M and N, the Eigenvalues and eigenvector of M and N of a given matrices $(i) M = \begin{bmatrix} -4 & 5 \\ 8 & -11 \end{bmatrix} \quad (ii) N = \begin{bmatrix} 0.33 & 1 & 3.3 \\ 0.5 & 0.45 & -5.12 \\ 2 & -2 & 0 \end{bmatrix} :$ | 4 | 3 | 7 |
| | b). | Write a program to solve the set of linear system equations using the Matrix inverse method. $2x_1 + 4x_2 - 6x_3 = -4$ $x_1 + 5x_2 + 3x_3 = 10$ $x_1 + 3x_2 + 2x_3 = 5$ | 4 | 3 | 7 |
| | | OR | | | |
| 8. | | Write a program to solve the first order ordinary differential equation as given below: $dx/dt = x + t$.With the initial conditions $x(0) = 0$. | 4 | 3 | 14 |
| | | | | | |
| | | UNIT-V | | | |
| 9. | | Write a simple program to solve a nonlinear equation using gauss-seidel Iteration. Assume necessary data is required. $f(x) = x^3 - 6x^2 + 11x + 6 = 0$. | 5 | 3 | 14 |
| | | OR | | | |
| 10. | a). | Explain in detail about the Rungekutta-4 method for solving ordinary differential equation. | 5 | 3 | 7 |
| | b). | Explain in detail about the trapezoidal method for solving integral equation. | 5 | 4 | 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: B20ITOE05 | | | | | |
|--------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------|------------|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| CLOUD COMPUTING (Open Elective-III) | | | | | |
| (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 |
| UNIT - I | | | | | |
| 1 | a). | What is Cloud Computing? Explain about Cloud Components with neat diagrams. | 1 | 2 | 7 |
| | b). | Distinguish and differentiate Full Virtualization and Para Virtualization. | 1 | 2 | 7 |
| OR | | | | | |
| 2 | a). | How do you Apply and Distinguish Full Virtualization and Para Virtualization concepts in high performance computing applications? | 1 | 2 | 14 |
| UNIT - II | | | | | |
| 3 | a). | Analyze open SaaS Solution and Mashup with real time examples? How to apply Service Oriented Architecture diagrams in developing any cloud application? | 2 | 2 | 7 |
| | b). | Build a PaaS application using Google App Engine and Force.com? | 2 | 2 | 7 |
| OR | | | | | |
| 4 | a). | Apply IaaS concepts to improving Performance through Load Balancing with neat diagrams? | 2 | 2 | 7 |
| | b). | Write and Analyze different types of Server in IaaS solutions? Apply IaaS Solution concepts to build a RACKSPACE? | 2 | 2 | 7 |
| UNIT - III | | | | | |
| 5 | a). | Discuss and Analyze Client Server Distributed Architecture for Cloud? | 3 | 2 | 7 |
| | b). | Distinguish the Traditional Apps and Cloud Apps. | 3 | 2 | 7 |
| OR | | | | | |
| 6 | a). | Apply Design concepts to design a Cloud based solutions? | 3 | 2 | 7 |
| | b). | Design Web application Framework by applying AJAX framework concepts? | 3 | 2 | 7 |
| UNIT - IV | | | | | |

| | | | | | |
|----|-----|-------------------------------------------------------------------------------------------------------|---|---|---|
| 7 | a). | Write an Analysis Document on the business continuity and Disaster Recovery in the Cloud environment? | 4 | 2 | 7 |
| | b). | Explain about the managing the cloud. | 4 | 2 | 7 |
| | | OR | | | |
| 8 | a). | Analyze Data Storage Wiping concept to prevent inadvertent data access? | 4 | 2 | 7 |
| | b). | Discuss about the migrating to the cloud. | 4 | 2 | 7 |
| | | UNIT - V | | | |
| 9 | a). | Write an Analysis Document on MapReduce and Hadoop? | 5 | 3 | 7 |
| | b). | Analysis and access the Big Data and its impact on Cloud? | 5 | 3 | 7 |
| | | OR | | | |
| 10 | a). | Summarize the features of Google web tool kit | 5 | 2 | 7 |
| | b). | Elaborate on share point services and Exchange Online. | 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: B20MEOE07 | | | | | |
|-------------------------------------------------|-----|------------------------------------------------------------------------------|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| GREEN ENERGY SYSTEMS (Open Elective-III) | | | | | |
| (For AIDS, CE, CSBS, CSE, ECE & IT) | | | | | |
| 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 |
| UNIT-I | | | | | |
| 1. | a). | Explain the extraterrestrial and terrestrial solar radiation. | 1 | 2 | 7 |
| | b). | Explain any two solar radiation measurement devices with help of neat sketch | 1 | 2 | 7 |
| OR | | | | | |
| 2. | a). | Enumerate the different types of concentrating type collectors. | 1 | 2 | 7 |
| | b). | Discuss the difference between a pyrliometer and pyranometer | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Illustrate the solar pond with neat sketch. | 2 | 3 | 7 |
| | b). | How are wind energy systems classified? Explain | 2 | 2 | 7 |
| OR | | | | | |
| 4. | a). | Illustrate the central tower receiver power plant with neat sketch | 2 | 3 | 7 |
| | b). | Explain the Horizontal axis wind mill with neat sketch | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5. | a). | Explain the three basic kinds of geo thermal resources. | 3 | 2 | 7 |
| | b). | Explain the methods of harnessing of geo -thermal energy | 3 | 2 | 7 |
| OR | | | | | |
| 6. | a). | Illustrate how heat is extracted from hot dry rocks with neat sketch | 3 | 3 | 7 |
| | b). | Discuss the working of KVIC digester with neat sketch | 3 | 2 | 7 |
| UNIT-IV | | | | | |
| 7. | a). | Explain the controls of HVAC. | 4 | 2 | 7 |
| | b). | Describe the classification of fuel cells based on the type of electrolyte | 4 | 2 | 7 |
| OR | | | | | |
| 8. | a). | Discuss the working of hydrogen –oxygen fuel cell | 4 | 2 | 7 |
| | b). | Explain the working of Axial flow compressor with neat sketch | 4 | 2 | 7 |

| | | UNIT-V | | | |
|------------|------------|-----------------------------------------------------------------------------|---------------------------|----------------|----------|
| 9. | a). | List the construction material used in green buildings and explain briefly. | 5 | 2 | 7 |
| | b). | Discuss the benefits of green manufacturing systems. | 5 | 2 | 7 |
| | | OR | | | |
| 10. | a). | Explain the environmental impact of current manufacturing systems | 5 | 2 | 7 |
| | b). | Describe about the vegetable based cutting fluids | 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

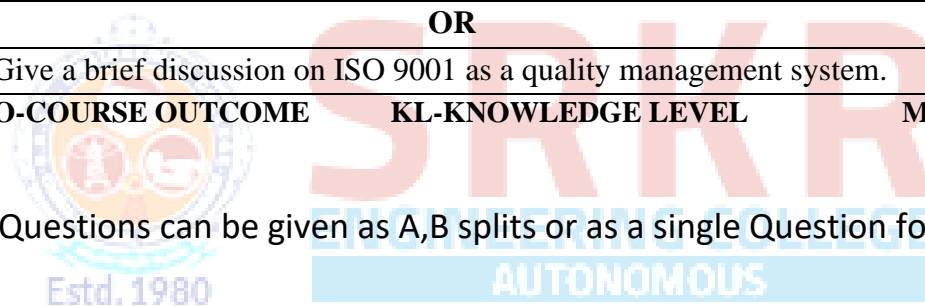


| Course Code: B20MEOE08 | | | | | |
|-------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------------------|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| TOTAL QUALITY MANAGEMENT (Open Elective-III) | | | | | |
| (For AIDS, CE, CSBS, CSE, ECE, EEE & IT) | | | | | |
| 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 |
| UNIT-I | | | | | |
| 1. | a). | What is TQM? Explain the basic approach of TQM. | 1 | 2 | 7 |
| | b). | What are the contributions of quality gurus in TQM journey? | 1 | 2 | 7 |
| OR | | | | | |
| 2. | a). | Explain the framework for TQM system with a neat schematic diagram. | 1 | 2 | 7 |
| | b). | What are the obstacles in implementing TQM? Explain | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Explain the Deming's philosophy and 14 points. | 2 | 2 | 7 |
| | b). | Briefly discuss the quality statements of an organization. | 2 | 2 | 7 |
| OR | | | | | |
| 4. | a). | Explain the Kano model of transforming customer needs into requirements with a neat diagram. | 2 | 2 | 7 |
| | b). | Give an overview of unions and employee involvement. What are their benefits? | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5. | a). | Explain with a schematic the input – output process model. What are the basic ways to improve a process? | 3 | 2 | 7 |
| | b). | What are the approaches towards continuous process improvement? Explain briefly Juran's trilogy. | 3 | 2 | 7 |
| OR | | | | | |
| 6. | | Explain the concept of PDSA cycle in detail. | 3 | 2 | 14 |
| UNIT-IV | | | | | |
| 7. | | The number of letter misprints per page of a book, where 24 pages have been taken at random from this book, is given below. Draw appropriate | 4 | 3 | 14 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | control chart and state the control of the printing process. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <tr> <td>Page</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> </tr> <tr> <td>Misprints</td> <td>7</td> <td>0</td> <td>7</td> <td>8</td> <td>17</td> <td>2</td> <td>6</td> <td>6</td> </tr> <tr> <td>Page</td> <td>9</td> <td>10</td> <td>11</td> <td>12</td> <td>13</td> <td>14</td> <td>15</td> <td>16</td> </tr> <tr> <td>Misprints</td> <td>8</td> <td>5</td> <td>3</td> <td>5</td> <td>2</td> <td>5</td> <td>1</td> <td>5</td> </tr> <tr> <td>Page</td> <td>17</td> <td>18</td> <td>19</td> <td>20</td> <td>21</td> <td>22</td> <td>23</td> <td>24</td> </tr> <tr> <td>Misprints</td> <td>1</td> <td>9</td> <td>0</td> <td>1</td> <td>0</td> <td>9</td> <td>3</td> <td>8</td> </tr> </table> | Page | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Misprints | 7 | 0 | 7 | 8 | 17 | 2 | 6 | 6 | Page | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | Misprints | 8 | 5 | 3 | 5 | 2 | 5 | 1 | 5 | Page | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | Misprints | 1 | 9 | 0 | 1 | 0 | 9 | 3 | 8 | | | |
| Page | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Misprints | 7 | 0 | 7 | 8 | 17 | 2 | 6 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Page | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Misprints | 8 | 5 | 3 | 5 | 2 | 5 | 1 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Page | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Misprints | 1 | 9 | 0 | 1 | 0 | 9 | 3 | 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | OR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | a). | What is meant by Taguchi's loss function? Outline nominal the best type loss function. | 4 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b). | What are the different categories of quality cost? Give examples for them. | 4 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | UNIT-V | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | What is the use of QFD? How do you build the house of quality (HOQ) in QFD? | 5 | 3 | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | OR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10. | | Give a brief discussion on ISO 9001 as a quality management system. | 5 | 2 | 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



| Course Code: B20MEOE09 | | | | | |
|-------------------------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------|------------------|----|-----|
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | | R20 |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| SUPPLY CHAIN MANAGEMENT (Open Elective-III) | | | | | |
| (For AIDS, CE, CSBS, CSE, ECE, EEE & IT) | | | | | |
| 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 |
| UNIT-I | | | | | |
| 1. | a). | What is the concept of Supply chain and explain its objective. | 1 | 2 | 7 |
| | b). | Describe the cycle view of supply chain processes with an example | 1 | 2 | 7 |
| OR | | | | | |
| 2. | a). | Describe how a company achieves strategic fit between its supply chain strategy and its competitive strategy. | 1 | 2 | 7 |
| | b). | Describe the major challenges to achieving and maintaining strategic fit. | 1 | 2 | 7 |
| UNIT-II | | | | | |
| 3. | a). | Describe the Impellers of supply chain developments. | 2 | 2 | 7 |
| | b). | Describe the roles of different drivers of supply chain and depict the cross functional framework of supply chain drivers. | 2 | 2 | 7 |
| OR | | | | | |
| 4. | a). | Define the key metrics of supply chain performance in terms of the driver "Transportation" | 2 | 2 | 7 |
| | b). | Describe the components of the driver "Sourcing" | 2 | 2 | 7 |
| UNIT-III | | | | | |
| 5. | a). | Discuss factors influencing distribution network design. | 3 | 2 | 7 |
| | b). | Describe the distribution network design "manufacturer storage with direct shipping and in-transit merge". | 3 | 2 | 7 |
| OR | | | | | |
| 6. | a). | Describe the role of network design in the supply chain? | 3 | 2 | 7 |
| | b). | What are the factors influencing network design decisions? Explain them in brief. | 3 | 2 | 7 |
| UNIT-IV | | | | | |

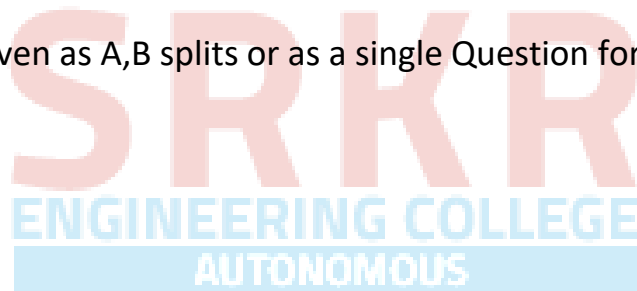
| | | | | | |
|-----|-----|--------------------------------------------------------------------------------------------------|---|---|---|
| 7. | a). | What is Bullwhip effect? What is the impact of lack of coordination on supply chain performance? | 4 | 2 | 7 |
| | b). | Describe briefly the levers to achieve coordination. | 4 | 2 | 7 |
| | | OR | | | |
| 8. | a). | Present a note on continuous replenishment and vendor managed inventories. | 4 | 2 | 7 |
| | b). | Describe the obstacles in achieving supply chain coordination. | 4 | 2 | 7 |
| | | UNIT-V | | | |
| 9. | a). | What is the role of sustainability in the supply chain? | 5 | 2 | 7 |
| | b). | Present a note on the metrics for sustainability. | 5 | 2 | 7 |
| | | OR | | | |
| 10. | a). | What is the role played by any two supply chain drivers in improving the sustainability? | 5 | 2 | 7 |
| | b). | Present a note on Closed-loop supply chains. | 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: B20BSOE03 | | | | | |
| SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) | | | | R20 | |
| IV B.Tech. I Semester MODEL QUESTION PAPER | | | | | |
| MATHEMATICAL MODELLING FOR DATA SCIENCE (Open Elective-III) | | | | | |
| (For CE, CSBS, CSE, ECE, 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 |
| UNIT-I | | | | | |
| 1. | a). | Explain the following: (i) Joint Probability distribution function for discrete random variables. (ii) Marginal probability distribution (iii) Conditional probability distribution | 1 | 3 | 7 |
| | b). | Two cards are selected at random from a box which contains five cards numbered 1, 1, 2, 2 and 3. Find the joint distribution of X and Y where X denotes the sum and Y, the maximum of the two numbers drawn. Also determine Cov (X,Y) and $\rho(X,Y)$. | 1 | 3 | 7 |
| OR | | | | | |
| 2. | | Every year, a man trades his car for a new car. If he has a Maruti, he trades it for an Ambassador. If he has an ambassador, he trades it for Santro. However, if he has a Santro, he is just as likely to trade it for a new Santro as to trade it for a Maruti or an Ambassador. In 2020 he bought his first car, which was a Santro. (a) Find the probability that he has (i) 2022 Santro (ii) 2022 Maruti (iii) 2023 Ambassador (iv) 2023 Santro. (b) In the long run, how often will he have a Santro? | 1 | 3 | 14 |
| UNIT-II | | | | | |
| 3. | a). | Explain Queuing theory with block diagram and discuss the characteristics of queuing models. | 2 | 3 | 7 |
| | b). | A T.V. repair man finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. He repairs sets in the order in which they arrive. The arrival of the sets is approximately Poisson with an average of 10 per an eight-hour day. Find the repairman's idle time each day. How many jobs are ahead of the average set just brought in? | 2 | 3 | 7 |
| OR | | | | | |
| 4. | a). | Mention the characteristics of (M/M/1: ∞ /FIFO) queuing system. | 2 | 3 | 7 |
| | b). | In a railway marshaling yard, goods trains arrive at a rate of 30 trains per day. | 2 | 3 | 7 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|------|------|------|------|------|------|------|-------------------------|------|----------------------------------------|-----------|------|------|------|------|----|----|----|----|---|---|---|---|----|
| | | Assuming that inter-arrival times follow an exponential distribution and the service time distribution is also exponential with an average 36 minutes. Calculate the following: (i) The average number of trains in the queue. (ii) The Probability that the queue size exceeds 10 If the input trains increases to average 33 per day, what will be the change in (i) & (ii)? | | | | | | | | | | | | | | | | | | | | | | | | | |
| UNIT-III | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5. | a). | What is simulation? Write the steps in simulation process. | 3 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | |
| | b). | Explain the following: (i) Monte-Carlo simulation (ii) Types of Simulation Models (iii) Phases of Simulation Models | 3 | 3 | 7 | | | | | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6. | | Records of 100 truckloads of finished jobs arriving in a department's check-out area show the following: Checking-out takes 5 minutes and checker takes care of only one truck at a time. The data is summarized in the following table. <table border="1" style="margin-left: 20px;"> <tr> <td>Truck inter-arrival time(min)</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> <td>10</td> </tr> <tr> <td>Frequency</td> <td>1</td> <td>4</td> <td>7</td> <td>17</td> <td>31</td> <td>23</td> <td>7</td> <td>5</td> <td>3</td> <td>2</td> </tr> </table> As soon as the trucks are checked out, the truck drivers take them to the next departments. Using Monte-Carlo simulation, determine: (i) What is the average waiting time before service? (ii) What is likely to be the longest wait? | Truck inter-arrival time(min) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Frequency | 1 | 4 | 7 | 17 | 31 | 23 | 7 | 5 | 3 | 2 | 3 | 3 | 14 |
| Truck inter-arrival time(min) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | | | | | | | | | | | | | | | |
| Frequency | 1 | 4 | 7 | 17 | 31 | 23 | 7 | 5 | 3 | 2 | | | | | | | | | | | | | | | | | |
| UNIT-IV | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | a). | What is the Time series? Explain Components of a Time Series. | 4 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | |
| | b). | The following are the figures for the production of a firm for 9 years. Fit a trend line by the method of semi-averages. Predict the trend values for 1992 and 1994. <table border="1" style="margin-left: 20px;"> <tr> <td>Year (X)</td> <td>1982</td> <td>1983</td> <td>1984</td> <td>1985</td> <td>1986</td> <td>1987</td> <td>1988</td> <td>1989</td> <td>1990</td> </tr> <tr> <td>Production ([^]000 tons)</td> <td>30</td> <td>40</td> <td>35</td> <td>55</td> <td>45</td> <td>50</td> <td>64</td> <td>50</td> <td>60</td> </tr> </table> | Year (X) | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | Production ([^] 000 tons) | 30 | 40 | 35 | 55 | 45 | 50 | 64 | 50 | 60 | 4 | 3 | 7 | | |
| Year (X) | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | | | | | | | | | | | | | | | | | | |
| Production ([^] 000 tons) | 30 | 40 | 35 | 55 | 45 | 50 | 64 | 50 | 60 | | | | | | | | | | | | | | | | | | |
| OR | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8. | a). | Given the population figures of a country. Fit an exponential trend $y = a b^x$ and find the trend values. Estimate the population in 2031 <table border="1" style="margin-left: 20px;"> <tr> <td>Year (X)</td> <td>1961</td> <td>1971</td> <td>1981</td> <td>1991</td> <td>2001</td> <td>2011</td> <td>2021</td> </tr> <tr> <td>Population(Y) in crores</td> <td>25.0</td> <td>25.1</td> <td>27.9</td> <td>31.9</td> <td>36.1</td> <td>43.9</td> <td>54.7</td> </tr> </table> | Year (X) | 1961 | 1971 | 1981 | 1991 | 2001 | 2011 | 2021 | Population(Y) in crores | 25.0 | 25.1 | 27.9 | 31.9 | 36.1 | 43.9 | 54.7 | 4 | 3 | 7 | | | | | | |
| Year (X) | 1961 | 1971 | 1981 | 1991 | 2001 | 2011 | 2021 | | | | | | | | | | | | | | | | | | | | |
| Population(Y) in crores | 25.0 | 25.1 | 27.9 | 31.9 | 36.1 | 43.9 | 54.7 | | | | | | | | | | | | | | | | | | | | |
| | b). | Explain the following in the context of time series (i) Method of moving averages (ii) Method of semi averages | 4 | 2 | 7 | | | | | | | | | | | | | | | | | | | | | | |
| UNIT-V | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9. | | Explain the uncertainties in the least square coefficients. Also find the Hooke's law data compute S , $S_{\hat{\beta}_0}$ and $S_{\hat{\beta}_1}$ | 5 | 3 | 14 | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|------------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|------|------|------|------|------|------|------|------|----------|----------|----------|
| | | Weight | 0.0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | | | |
| | | Measured length | 5.06 | 5.01 | 5.12 | 5.13 | 5.14 | 5.16 | 5.25 | 5.19 | 5.24 | 5.46 | | | |
| | | Weight | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | | | |
| | | Measured length | 5.4 | 5.57 | 5.47 | 5.53 | 5.61 | 5.59 | 5.61 | 5.75 | 5.68 | 5.80 | | | |
| | | OR | | | | | | | | | | | | | |
| 10. | a). | Discuss the terms Outliers and Influential points in the context of Transforming the data. | | | | | | | | | | | 5 | 2 | 7 |
| | b). | In a study of reaction times, the time to respond to a visual stimulus(x) and the time to respond to an auditory stimulus(y) were recorded for each of 10 subjects. Times were measured in ms. The results are presented in the following table. | | | | | | | | | | | 5 | 3 | 7 |
| | | x | 161 | 203 | 235 | 176 | 201 | 188 | 228 | 211 | 191 | 178 | | | |
| | | y | 159 | 206 | 241 | 163 | 197 | 193 | 209 | 189 | 169 | 201 | | | |
| | | Find a 95% confidence interval for the correlation between the two reaction times. | | | | | | | | | | | | | |

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

