QP Code: _____ **Reg. No: _____**
Name: _____

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) MODEL QUESTION PAPER
FIFTH SEMESTER BCA HONOURS EXAMINATION
Core Course
MG5CCRBCA300 – Computer Networks
(2024 ADMISSION ONWARDS)

Duration: 1.5 Hours **Maximum Marks: 50 marks**

Remember(K), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create(C), Skill(S), Interest(I)and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

PART A
Short Answer Questions
Answer all questions. Each question carries 2 marks.

1. What is meant by resource sharing in computer networks? [K]/ [CO1]
2. Differentiate LAN and WAN. [K] / [CO1]
3. Briefly explain simplex, half duplex and full duplex transmission. [U] / [CO1]
4. Explain the functions of the router. [U] / [CO1]
5. Explain TCP/IP reference model. [K] / [CO2]
6. What is meant by byte stuffing? [U] / [CO2]
7. How many bits are used in an IPv4 address? Explain the address space in IPV4. [A] / [CO2]
8. Explain handshaking in TCP. [A] / [CO3]
9. What is a VPN and why it is used? [U] / [CO3]
10. How SDN is different from traditional networking? [A] / [CO3]

[10 × 2 = 20]

PART B
Short Essay Questions
Answer any 3 out of 5 questions. Each question carries 5 marks.

11. Explain various network topologies. [U] / [CO1]
12. Explain Circuit switching and Packet switching. Differentiate Datagram Networks and Virtual Circuit Networks. [U] / [CO1]
13. Explain functions of each layer in OSI reference model with a neat diagram [K] / [CO2]
14. Explain ALOHA, CSMA/CD and CSMA/CA protocols. [U] / [CO2]
15. Explain various congestion control techniques in TCP. [U] / [CO3]

[3× 5 = 15]

PART C
Essay Questions

Answer any 1out of 2 questions. Each question carries 15 marks

16. Explain the role of data link layer in error detection and error correction. [U] / [CO2]
17. Explain SNMP in detail. Describe its components, working and applications in network management. [A] / [CO3]

[1 × 15 = 15]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) Semester V

Core Course - MG5CCRBCA301 - DIGITAL MARKETING

Model Question Paper (2024 ADMISSION ONWARDS)

Duration: 1 Hour **Maximum Marks: 35**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A
Very Short Answer Questions
Answer any 5 out of 7 Questions
Each question carries 3 marks

1. Briefly outline the key differences between digital marketing and traditional marketing. [U] / [CO1]
2. Define the "digital customer journey" within the context of strategic planning. [K] / [CO1]
3. What are meta tags, and why are they important for On-Page SEO? [U] / [CO1]
4. What is link building, and what common mistakes should be avoided during this Off-Page SEO technique? [U] / [CO1]
5. Explain the concept of content curation strategies in digital marketing. [U] / [CO2]
6. Define "social media listening" and state why it is crucial for online reputation management. [K] / [CO2]
7. Identify two emerging technologies impacting social media marketing and briefly state their potential effect. [U] / [CO2]

[5 × 3 = 15 Marks]

Part B
Short Answer Questions
Answer any 4 out of 6 Questions
Each question carries 5 marks

8. Discuss the essential components of strategic planning in digital marketing to successfully target the modern consumer journey.
[An] / [CO1]
9. Explain the mechanics of search engines. Detail how search engines crawl, index, and rank web pages to deliver search results.
[An] / [CO1]
10. Describe the relationship between URL structure, keyword research, and content optimization when executing an On-Page SEO strategy.
[A] / [CO1]
11. Analyze the role of social media advertising in building and nurturing online brand communities. [An] / [CO2]
12. How can marketers utilize performance analytics and data-driven insights to track campaign performance and optimize Return on Investment (ROI)?
[A] / [CO2]
13. Discuss the importance of online reputation management. What specific strategies can a company implement to manage and improve its online brand perception?
[A] / [CO2]

[4 × 5 = 20 Marks]

QP Code: _____ Reg. No: _____

Name: _____

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) MODEL QUESTION PAPER
FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

MG5DSCCMA300 – Digital Marketing

Duration: 2 Hours **Maximum Marks: 70 marks**

PART A
Very Short Answer Questions
Answer all questions. Each question carries 2 marks.

1. Explain the importance of digital marketing in the present business environment. [U]/[CO1]
2. Explain keyword stuffing. [K]/[CO2]
3. Explain Keyword research and its importance is search engine optimization. [K]/[CO2]
4. Explain how social media platforms can be used for business promotion. [U]/[CO3]
5. Explain the concept of linking in web analytics and its significance in tracking website user interactions. [U]/[CO4]

[5× 2 = 10]

PART B
Short Answer Questions
Answer any 6 out of 8 questions. Each question carries 5 marks.

6. Differentiate digital marketing from traditional marketing. [U]/[CO1]
7. Explain how Pay-Per-Click (PPC) advertising works and analyze its role in achieving digital marketing objectives. [U]/[CO1]
8. Write note on search engine optimization(SEO). Explain various on-page and off-page optimization techniques. [U]/[CO2]
9. Differentiate SEO and Google Ads based on their role in organic and paid search .[U]/[CO2]
10. Explain site targeting with reference to Google Ads? [U]/[CO2]
11. Discuss blogging in digital marketing? Write note on any online platform used for for blogging. [U]/[CO3]
12. Discuss Audience Report? Explain different types of audience reports. [U]/[CO4]
13. Describe campaign tagging and reporting? [U]/[CO4]

[6× 5 = 30]

PART C
Essay Questions
Answer any 2 out of 3 questions. Each question carries 15 marks

14. Discuss the various digital marketing techniques and explain how they contribute to the promotion of a business. [U]/[CO1]
15. Social media has transformed the way businesses communicate with and engage their customers. Discuss the impact of Social Media Marketing on modern businesses, highlighting its advantages and limitations . [U]/[CO3]
16. Discuss the importance of Web Analytics? Describe various measures used to assess the performance of a website with reference to Google Analytics. [U]/[CO4]

[2 × 15= 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER

Discipline Specific Core Course (DSC) - MG5DSCCSC300 – Software Engineering

(2024 ADMISSION ONWARDS)

MODEL QUESTION PAPER

Duration: 2 Hours **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each Course Outcome (CO) to enhance their overall outcome attainability.

Part A
Very Short Answer Questions
Answer All Questions
Each question carries 2 marks

1. Define Software Engineering. [U] [CO1]
2. Describe the meaning of a software requirement. [U] [CO2]
3. What is the purpose of a Software Requirements Document. [U] [CO2]
4. Explain user testing [U] [CO3]
5. Compile estimation technique. [U] [CO4]

(5 x 2 = 10 Marks)

Part B
Short Answer Questions
Answer any 6 Questions
Each question carries 5 marks

6. Differentiate Cohesion and Coupling.? [An] [CO3]
7. Differentiate User requirements and System requirements. [U] [CO2]
8. Compile Agile Planning [A][CO4]
9. List the three categories of McCall's software quality factors [A] [CO4]
10. Distinguish various steps of Requirement Analysis [U] [CO2]
11. Classify the Risk Management [A] [CO4]
12. Explain the purpose of a use case. [U] [CO1]
13. Illustrate Modularity and state its importance in software design. [An] [CO3]

(6 x 5 = 30 Marks)

Part C
Essay Questions
Answer any 2 Questions
Each question carries 15 marks

14. Discuss Functional and Non-Functional requirements.	[U] [CO2]
15. Distinguish Different Life Cycle Models	[U] [CO1]
16. Differentiate various Software Testing	[An] [CO3]

(2 x 15 = 30 Marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIFTH SEMESTER

Discipline Specific Core Course (DSC) - MG5DSCCSC301 - Operating Systems

(2024 ADMISSION ONWARDS)

MODEL QUESTION PAPER

Duration: 2 Hours **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each Course Outcome (CO) to enhance their overall outcome attainability.

Part A
Very Short Answer Questions
Answer All Questions
Each question carries 2 marks

1. Define an Operating System. [U] [CO1]
2. List any two types of operating systems, giving an example of each. [K] [CO1]
3. Name any two CPU scheduling criteria. [U] [CO2]
4. What is a deadlock? [U] [CO3]
5. State the concept of virtual memory. [U] [CO4]

(5 x 2 = 10 Marks)

Part B
Short Answer Questions
Answer any 6 Questions
Each question carries 5 marks

6. Distinguish between different types of user interfaces provided by an operating system. [U] [CO1]
7. Discuss the purpose of system calls and how a system call is made. [U] [CO1]
8. List the different types of system calls, giving one example of each. [K] [CO1]
9. Outline the contents of a Process Control Block (PCB). [U] [CO2]
10. Distinguish between long-term, short-term, and medium-term schedulers. [U] [CO2]
11. Describe the wait() and signal() operations of a semaphore, and their role in process synchronization. [U] [CO3]
12. Discuss the methods used for recovery from deadlock. [U] [CO3]
13. Illustrate the FIFO page replacement algorithm with a suitable example. [A] [CO4]

(6 x 5 = 30 Marks)

Part C
Essay Questions
Answer any 2 Questions
Each question carries 15 marks

14. Discuss the various methods of Inter-process Communication (IPC), with suitable examples of shared memory and message-passing systems. [A] [CO2]
15. Analyse the working of the Banker's Algorithm for deadlock avoidance with a suitable example. Compare its effectiveness with deadlock detection and recovery techniques in ensuring safe resource allocation. [An] [CO3]
16. Illustrate the memory management strategies of Contiguous Memory Allocation, Paging, and Segmentation, with suitable diagrams. [A] [CO4]

(2 x 15 = 30 Marks)

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP BCA (HONOURS)

FIFTH SEMESTER EXAMINATION (2024 ADMISSION ONWARDS)

MG5DSEBCA300: INTRODUCTION TO DATA SCIENCE

MODEL QUESTION PAPER

Duration: 2hrs Maximum Marks: 70

Remember(K), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create(C), Skill(S), Interest(I)and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

PART A

Answer all questions.

Each question carries 2 marks.

1. What is Data Science? Mention any one need for Data Science. **[K] [CO1]**

2. List the steps involved in the Data Science Life Cycle? **[K] [CO1]**

3. Define data. Mention any two types of data. **[K] [CO2]**

4. What is Exploratory Data Analysis? State its importance. **[U] [CO3]**

5. What is meant by Data Science Modelling? **[K] [CO4]**

(5 × 2 = 10 Marks)

PART B

Answer any five questions.

Each question carries 6 marks.

6. Explain the evolution of Data Science and describe the different roles in Data Science. **[U] [CO1]**

7. Explain the applications of Data Science in various fields. Discuss the prerequisites required for learning Data Science. **[U] [CO1]**

8. Discuss any three technical skills required for working with data science. **[U] [CO1]**

9. Explain the basic features of R and describe R data types and operators with suitable examples. **[U] [CO2]**

10. Explain the different types of Exploratory Data Analysis with suitable examples. **[U] [CO3]**

11. Explain Univariate, Bivariate and Multivariate Analysis with suitable examples**. [U] [CO3]**

12. Explain K-fold Cross-Validation and Stratified Cross-Validation**. [U] [CO4]**

(5 × 6 = 30 Marks)

PART C

Answer any two questions.

Each question carries 15 marks.

13. Duscuss the major Data Pre-processing techniques used to prepare raw data for analysis. **[An] [CO2]**

14. Apply the steps of EDA to a given dataset. Illustrate how appropriate EDA techniques and tools can be used to understand the characteristics and patterns of the data. **[A] [CO3]**

15. Analyse the process of Linear Model Selection and Diagnostics. Explain the importance of Model Evaluation and Metrics in Data Science. **[An] [CO4]**

(2 × 15 = 30 Marks)

QP Code: _____ Reg. No: _____

Name : _____

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) MODEL QUESTION PAPER

FIFTH SEMESTER BCA HONOURS EXAMINATION

MG5DSEBCA301 – TIME SERIES ANALYSIS

(2024 ADMISSION ONWARDS)

Duration: 2 Hours **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create(C), Skill(S), Interest(I)and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

PART A
Short Answer Questions
Answer all questions. Each question carries 2 marks.

1.	Define a time series. Give any two examples.	[K]/ [CO1]
2.	State any four applications of time series analysis.	[K] / [CO1]
3.	What is a time series plot? State its importance.	[U] / [CO2]
4.	Define Weighted Least Squares.	[K] / [CO3]
5.	Define a Vector Autoregressive (VAR) model.	[K] / 'CO4]

[5 × 2 = 10]

PART B
Short Essay Questions
Answer any 5 out of 7 questions. Each question carries 6 marks.

6.	Explain the different types of data used in time series analysis. Distinguish between cross-sectional data and time series data with suitable examples.	[U] / [CO1]
7.	Define forecasting and state its major objectives and uses	[U] / [CO1]
8.	Explain the internal structures of a time series. Discuss trend, seasonal, cyclical and irregular variations.	[U] / [CO1]
9.	Explain the role of graphical displays and time series plots in the preliminary analysis of forecasting data.	[U] / [CO2]
10.	Explain the purpose of model adequacy checking. Describe the importance of residual analysis in regression models.	[U] / [CO3]
11.	Explain the basic architecture of a Neural Network used for time series forecasting. Describe the input, hidden and output layers.	[U] / [CO4]
12.	Define Spectral Analysis. Explain how a periodogram helps identify periodic or cyclical patterns in a time series.	[U] / [CO4]

[5 × 6 = 30]

PART C
Essay Type Questions
Answer any 2 out of 3 questions. Each question carries 15 marks.

13. Explain the general approach to time series modelling and forecasting in detail. Discuss the major stages involved from preliminary data analysis and model identification through parameter estimation, diagnostic checking, forecasting and evaluation of forecasting performance. [An] / CO2]

14. Discuss Regression Models for General Time Series Data in detail. Explain the problems that may arise due to autocorrelated errors and analyse the role of appropriate regression methods, including Generalized and Weighted Least Squares, in improving model estimation and inference. [An] / [CO3]

15. Explain the major approaches used in multivariate time series forecasting. Discuss Multivariate Stationary Processes, Vector ARIMA Models and Vector AR (VAR) Models. Analyse how Bayesian methods or Neural Networks can contribute to modern forecasting. [An] / [CO4]

[2 × 15 = 30]

——— End of Question Paper ———

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) MODEL QUESTION PAPER

Semester V

MG5DSEBCA302 - Machine Learning

(*2024 ADMISSION ONWARDS*)

Duration: 2 Hours **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries **2** marks.

1. Define Machine Learning. How does it differ from conventional programming? [U] [CO1]
2. Distinguish between a labelled dataset and an unlabelled dataset. [U] [CO1]
3. Differentiate between regression and classification problems. [An] [CO2]
4. Analyse the significance of linear separability in the working of a Linear Perceptron. [An] [CO3]
5. Mention any two ethical considerations in Machine Learning. [U] [CO4]

[2*5=10 Marks]

Part B

Short Answer Questions

Answer any 5 questions

Each question carries **6** marks.

6. Explain the Confusion Matrix. [U] [CO1]
7. Compare Simple Linear Regression, Multiple Linear Regression. [U] [CO2]
8. Analyse the structure and working of a Multilayer Perceptron in comparison with a Linear Perceptron. [An] [CO3]
9. Apply the K-Means clustering algorithm to group a given set of data points into an appropriate number of clusters. Explain the steps involved. [A] [CO4]
10. A large dataset requires efficient and scalable clustering. Explain how BIRCH can be applied for clustering such data. [U] [CO4]

11. Explain any three realworld applications of Machine Learning [U] [CO4]
12. Explain different clustering validation measures to assess the quality of the clusters obtained from a clustering algorithm. [U] [CO4]

[6*5=30 Marks]

Part C

Essay Questions
Answer any 2 questions
Each question carries **15** marks

13. Describe the Machine Learning learning framework. [U] [CO1]
14. Analyse the importance of data preprocessing, feature selection, and feature extraction in developing Machine Learning models. [An] [CO2]
15. Analyse the architecture and working of a Feed Forward Neural Network. [An] [CO3]

[15*2=30 Marks]

QPCode……

Reg.No : .....

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP BCA (HONOURS) EXAMINATION OCTOBER 2026

FIFTH SEMESTER

DSE-MG5DSEBCA303-NEURAL NETWORKS

(2024 ADMISSION ONWARDS)

Duration: 2 hours Maximum Marks: 70

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries 2 marks

1. What is the purpose of the ReLU activation function? [K] [CO1]

2. What is a feature map in a Convolutional Neural Network? [K] [CO2]

3. What is the exploration–exploitation trade-off in reinforcement learning? [U] [CO3]

4. What is the main purpose of dimensionality reduction? [U] [CO4]

5. What is Unsupervised Learning? [K] [CO4]

[2 × 5 = 10]

Part B

Short Answer Questions

Answer any 5 questions

Each question carries 6 marks

6. Explain the backpropagation algorithm used for training a neural network. [U] [CO1]

7. Explain convolution operation, filters and feature extraction in CNNs. [U] [CO2]

8. Explain stride, padding and output dimension calculation in a convolutional layer. [U] [CO2]

9. Explain the architecture and working of a basic Recurrent Neural Network. [U] [CO3]

10. Explain the PCA algorithm and discuss how dimensionality reduction is achieved using PCA. [An] [CO4]

11. Explain the architecture of Deep Convolutional GAN. [U] [CO4].

12. Explain K-Means clustering as unsupervised learning technique. [U] [CO4]

[6 × 5 = 30]

Part C

Essay Questions

Answer any 2 questions

Each question carries 15 marks

13. Explain the fundamentals of neural networks in detail. Discuss feedforward computation, weights and biases. Also describe the basic features and uses of TensorFlow and PyTorch. [U] [CO1]

14. Explain Convolutional Neural Networks in detail. Discuss the design features of LeNet, AlexNet, VGG and ResNet. [K] [CO2]

15. Compare advanced RNN architectures-LSTM and GRU [An] [CO3]

[15 × 2 = 30]

MAHATMA GANDHI UNIVERSITY

BCA (HONOURS) FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

MG5DSEBCA304 -Digital Image Processing

Model Question Paper

Max. Marks: 70 **Time 2 Hours**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries **2** marks

1	Describe brightness adaptation.	[U][CO 1]
2	Define digital image processing. Compute the space requirement of a 250X250 color image.	[U][CO 1]
3	Explain the role of basic set operations in image processing	[An][CO 3]
4	Explain the concepts of dilation operation.	[U][CO 3]
5	How does impulse noise affect an image,.	[R][CO 4]

(5*2=10 Marks)

Part B

Short Answer Questions

Answer any **5** questions

Each question carries **6** marks

6	Compare different color models	[An][CO 1]
7	Explain the different components of Digital image processing system.	[U][CO 1]
8	Describe the fundamental steps in digital image processing.	[U][CO 1]
9	Explain basic intensity transformation functions.	[U][CO 2]
10	Analyse the effect of Histogram matching on the contrast and brightness of an image	[An][CO 2]
11	Explain the use of closing and opening operation in noise removal.	[An][CO 3]
12	Compare horizontal and vertical edge detection filters.	[An][CO 4]

(6*5=30 Marks)

Part C

Essay Questions

Answer any **2** questions

Each question carries **15** marks

13	Compare smoothing and sharpening spatial filters	[An][CO 2]
14	Explain Hit-or-miss transformation with suitable example, How it is used for pattern recognition	[An][CO 3]
15	Compare different region based segmentation methods,	[An][CO 4]

(2*15=30 Marks)

QPCode

Reg.No : .....

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP BCA (HONOURS) EXAMINATION OCTOBER 2026

FIFTH SEMESTER
DSE- MG5DSEBCA305- NATURAL LANGUAGE PROCESSING
(2024 ADMISSION ONWARDS)

Duration: 2 hours **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries **2** marks

1. What is meant by Natural Language Processing (NLP)? [K] / [CO1]
2. What is articulatory phonetics? [U] / [CO1]
3. What is a Finite State Automaton? [K] / [CO2]
4. Define a lexeme and a phoneme. [K] / [CO3]
5. Give the significance of text coherence? [U] / [CO4]

[2x5 = 10]

Part B

Short Answer Questions

Answer any **5** questions

Each question carries **6** marks

6. Explain the different levels of language analysis in NLP. [K] / [CO1]
7. What is WordNet? Mention its main purpose in NLP. [U] / [CO1]
8. Describe stochastic Part-of-Speech tagging using Hidden Markov Models. [U] / [CO2]
9. Explain Context-Free Grammar (CFG) and construct a simple CFG for generating basic English sentences. [A] / [CO3]
10. Explain the structure and applications of TreeBank in natural language processing. [U] / [CO3]
11. Given the sentence "The student went to the bank to deposit money," explain how context helps in identifying the correct sense of the word *bank*. [A] / [CO4]
12. Analyse how pronoun resolution, cohesion, and coherence help an NLP system understand the structure and meaning of a text. [An]/[CO4]

[6x5 = 30]

Part C

Essay Questions

Answer any **2** questions

Each question carries **15** marks

13. Explain Finite State Transducers (FSTs) in detail. Describe their role in morphological analysis and generation with a suitable example. [An] / [CO2]

14. Describe the major parsing techniques used in NLP. Discuss top-down parsing, bottom-up parsing, chart parsing, unification-based parsing, and probabilistic parsing using PCFGs. [An] / [CO3]

15. Explain the major approaches to Word Sense Disambiguation. Discuss dictionary-based and machine learning approaches and the evaluation of WSD systems. [U] / [CO4]

[15x2 = 30]

QPCode……

Reg.No : .....
Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP BCA (HONOURS) EXAMINATION OCTOBER 2026

FIFTH SEMESTER

DSC-MG5DSEBCA306-WEB DEVELOPMENT WITH PYTHON DJANGO/FLASK

(2024 ADMISSION ONWARDS)

Duration: 2 hours **Maximum Marks: 70**

Remember (K), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C), Skill (S), Interest (I) and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries 2 marks

1. What is the purpose of Flask-WTF? [K] [CO1]

2. What is Flask-SQLAlchemy? [K] [CO2]

3. What is the MVT pattern in Django? [K] [CO3]

4. What is the purpose of LoginRequiredMixin in Django? [U] [CO4]

5. List any three Generic Class-Based Editing Views (GCBVs) used for form handling. [K] [CO4]

[2 × 5 = 10]

Part B

Short Answer Questions

Answer any 5 questions

Each question carries 6 marks

6. Explain the request-response cycle in a Flask application with routes and view functions.[U][CO1]

7. Explain Jinja2 template inheritance in Flask. [U] [CO1]

8. Explain the CRUD operations using Flask-SQLAlchemy. [U] [CO2]

9. Explain the MVT architecture of Django and the role of Model, View and Template. [U][CO3]

10. Detail how to create a custom user model by extending AbstractUser [U] [CO4]

11. Explain the use of Django's authentication system for login and logout. [U] [CO4]

12. List the main components used for deploying a Django application to Heroku [K][CO4]

[6 × 5 = 30]

Part C

Essay Questions

Answer any 2 questions

Each question carries 15 marks

13. Explain the main features of Flask web application development, including routes, view functions, Jinja2 templates and Flask-WTF forms. [U] [CO1]

14. Explain database operations in Flask using Flask-SQLAlchemy and Flask-Migrate. [U] [CO2]

15. Explain the main components of Django, including MVT architecture, URL dispatcher, templates, models, ORM, and Django Admin. [U] [CO3]

[15 × 2 = 30]

QPCode **Reg.No : .....**

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU-UGP (HONOURS) EXAMINATION
FIFTH SEMESTER
MG5DSEBCA307 - CROSS-PLATFORM APPLICATION DEVELOPMENT WITH DART AND FLUTTER
(2024 ADMISSION ONWARDS)

Duration: 2 Hours **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Answer all questions. Each question carries 2 marks

1. What is the purpose of the abstract keyword in Dart? [U] / [CO1]
2. List any four key features of the Dart programming language [K] / [CO1]
3. Differentiate between ?? and ??= operators in Dart. [U] / [CO2]
4. State the difference between MaterialApp and CupertinoApp widgets. [U] / [CO3]
5. What is a Tween in Flutter animations? [K] / [CO4]

[5 x 2 = 10]

Part B

Short Answer Questions

Answer any 5 questions. Each question carries 6 marks

6. Explain the concept of named constructors and mixins in Dart with examples. [U] / [CO1]
7. Compare and contrast the use of switch statements and if-else blocks for conditional flow in Dart, and demonstrate how to use iterable-specific loops to process a collection with a code snippet [U] / [CO1]
8. Describe the structure of a Dart function, and differentiate between positional optional parameters and named optional parameters, providing examples of how default values are assigned to each [U] / [CO1]
9. Explain the concept of Isolates in Dart. How do they differ from Futures in handling concurrent operations? [U] / [CO2]
10. Explain the basics of navigation and routing in a Flutter application, detailing the various techniques that can be utilized to pass data between different pages and widgets. [U] / [CO3]
11. How can you create responsive layouts in Flutter? Explain the use of LayoutBuilder and MediaQuery. [A] / [CO3]
12. Write the steps to perform manual JSON parsing in a Flutter application with a suitable example. [A] / [CO4]

[5 x 6 = 30]

Part C

Essay Questions

Answer any 2 questions. Each question carries 15 marks

13. Compare Stateless and Stateful widgets, and explain the distinct roles of the Element and RenderObject in Flutter's architecture. Demonstrate the use cases for fundamental layout widgets like Row, Column, and Stack [A] / [CO2]

14. Explain the Provider pattern for state management in Flutter. How do you pass the state down the widget tree and update the UI efficiently? [A] / [CO3]

15. Describe how to fetch data from the internet using HTTP packages in Flutter. Explain the procedure to persist this fetched data locally using SQLite. [A] / [CO4]

[2 x 15 = 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP(HONOURS) FIFTH SEMESTER EXAMINATION

MG5DSECSC300- COMPUTER SECURITY

(2024 ADMISSION ONWARDS)

Duration: 2 Hours **Max. Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation (Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer **all** questions

Each question carries **2** marks

1) Describe the importance of security in a computer network. [U] [CO1]
2) State the purpose of password policies. [U] [CO3]
3) Identify the three basic factors used for authentication. [U] [CO3]
4) Define biometric authentication. [U] [CO4]
5) Identify which VPN architecture is suitable for securely connecting two branch networks. [U] [CO4]

Part B

Short Answer Questions

Answer any **6** questions

Each question carries **5** marks

6) Explain the major approaches used for computer security. [K] [CO1]
7) Differentiate between specific security mechanisms and pervasive security mechanisms. [U] [CO1]
8) Compare active attacks and passive attacks with suitable examples. [U] [CO1]

9) Discuss the importance of security awareness training in reducing the success rate of phishing attacks. [U] [CO1]

10) Encrypt the message "HELLO" using a Caesar cipher with a shift of 3 and show the steps. [A] [CO2]

11) Discuss the advantages and limitations of the Vigenère cipher. [U] [CO2]

12) Explain Network Behavior Analysis (NBA) and its significance in intrusion detection. [U] [CO3]

13) Explain packet-filtering firewalls and how they use packet information to make filtering decisions. [U] [CO4]

Part C

Essay Questions

Answer any **2** questions

Each question carries **15** marks

14) Explain monoalphabetic cipher in detail? Describe its encryption mechanism, illustrate it with a suitable example, and discuss its limitations and vulnerability to frequency analysis. [A] [CO2]

15) Explain various techniques used by malware to infect and compromise computer systems. [U] [CO3]

16) Define biometric authentication. Examine the various biometric techniques employed in security systems, highlighting their advantages and limitations. [U] [CO4]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

BSc (Honours) Computer Science
FIFTH SEMESTER EXAMINATION
(2024 Admission Onwards)

MG5DSECSC301: RESOURCE OPTIMIZATION TECHNIQUES

MODEL QUESTION PAPER

Duration: 2 Hrs Maximum Marks: 70

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

PART A: Very Short Answer Questions.
(Answer **All** Questions. Each question carries **2** marks.)

1. What are the exceptional cases that may arise while solving an LPP graphically? [U] [CO1]
2. A primal LPP has 3 decision variables and 5 constraints. Apply the properties of duality to determine the number of variables and constraints in its dual problem. [A]CO2]
3. What is a prohibited assignment problem? [K] [CO3]
4. Distinguish between PERT and CPM. [An] [CO4]
5. List any two steps involved in the Operations Research methodology. [K] [CO1]

[5 × 2 = 10]

PART B: Short Answer Questions
(Answer **6** out of **8** questions, each question carries **5** marks.)

6. Explain the nature, characteristics and methodology of Operations Research. [U] [CO1]
7. Estimate the following LPP graphically:
   Maximize
   $Z = 5x_1 + 4x_2$
   Subject to
   $6x1 + 4x2 \leq 24$
   $x1 + 2x2 \leq 6$
   $x1, x2 \geq 0$ [U] [CO1]
8. Distinguish slack and surplus variable. [U] [CO1]
9. Formulate the dual problem of the following primal LPP:
   Maximize
   Z=3x1+5x2
   Subject to
   $x1 + 2x2 \leq 8$
   $3x1 + 2x2 \leq 12$
   $x1, x2 \geq 0$ [A] [CO2]
10. Obtain an initial basic feasible solution for a given transportation problem using the Vogel's Approximation Method. Explain the steps involved in the method. [A] [CO3]
11. Illustrate the step-by-step procedure for applying the North-West Corner Method to obtain an initial basic feasible solution in a transportation problem. [A] [CO3]
12. A set of jobs has to be processed through two machines in the order M1–M2. Given the processing times for each job, determine the optimal sequence and minimum total elapsed time using Johnson's rule. [A] [CO4]
13. Illustrate the concept of Maintenance Crew Scheduling and analyse its main objectives. [An] [CO4]

[6 × 5 = 30]

PART C : Essay Questions

(Answer **2** out of **3** questions, each question carries **15** marks.)

14. Solve the following LPP using the simplex method and determine the optimal solution:

Maximize

$Z = 3x_1 + 5x_2$

Subject to

$x_1 + 2x_2 \leq 8$

$3x_1 + 2x_2 \leq 12$

$x_1, x_2 \geq 0$

Show the complete simplex table at each iteration. [A] [CO2]

15. Solve the following assignment problem using the Hungarian method and determine the minimum-cost assignment:

	J1	J2	J3	J4
W1	9	2	7	8
W2	6	4	3	7
W3	5	8	1	8
W4	7	6	9	4

[A] [CO3]

16. For the project activities and their precedence relationships given below, construct the network, determine the critical path and calculate the project duration using CPM. Also determine the slack of the non-critical activities.

Activity	**Predecessor**	**Duration**
A	–	4
B	–	6
C	A	5
D	A	3
E	B, C	4
F	C	6
G	D, E	5
H	F, G	3

[An] [CO4]

[2 ×15 = 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM
MGU – UGP (HONOURS) FIFTH SEMESTER EXAMINATION
MG5DSECSC302 - ARTIFICIAL INTELLIGENCE
(2024 ADMISSION ONWARDS)

Duration: 2 Hours **Max. Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions
Answer **all** questions
Each question carries **2** marks

1. Define Artificial Intelligence. [K] [CO1]
2. List two applications of Artificial Intelligence. [K] [CO1]
3. State the search order followed by Depth-First Search. [U] [CO2]
4. Differentiate between Prior Probability and Posterior Probability. [U] [CO4]
5. A person has a membership value of 0.8 in the fuzzy set Young. Interpret this value. [U] [CO4]

Part B

Short Answer Questions
Answer any **6** questions
Each question carries **5** marks

6. Define control strategy in AI problem solving. [U] [CO1]
7. Demonstrate Breadth-First Search for a given tree and trace the order of node expansion. [U] [CO2]
8. Analyze the advantages and limitations of Breadth-First Search. [A] [CO2]

9. Demonstrate the complete search path of A* Search for a given search tree using f(n)=g(n)+h(n). [A] [CO2]
10. Compare Hill Climbing and Greedy Best-First Search with respect to node selection, memory usage, and search behavior. [A] [CO2]
11. Represent the following statements using First-Order Predicate Logic: All humans are mortal. Socrates is a human. Some students are intelligent. [U] [CO3]
12. Explain the working principle of Backward Chaining with a suitable example. [U] [CO3]
13. A fuzzy controller receives a crisp value of 70 as its input. Explain how fuzzification converts this numerical input into fuzzy information. Analyze the significance of membership values obtained during this process. [An] [CO4]

Part C

Essay Questions

Answer any **2** questions

Each question carries **15** marks

14. Discuss how Expert Systems can be used as a knowledge-based tool in Environmental Management. Explain the process of using expert knowledge for environmental problem solving with suitable examples. [U] [CO1]
15. Analyze the role of universal and existential quantifiers in First-Order Predicate Logic and illustrate their use in representing real-world knowledge. [An] [CO3]
16. Analyze the complete process of fuzzification and defuzzification in a fuzzy system. Use a suitable example to support your analysis. [An] [CO4]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

MG5DSECSC303 – Web Designing using PHP

Duration: 2 Hrs Maximum Marks: 70

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions
Answer All Questions
Each question carries 2 marks

1. Define HTTP and state its default port number in WWW architecture. (K, CO1)
2. List any four primitive data types supported in PHP. (K, CO2)
3. State the syntax of a switch statement in PHP. (K, CO3)
4. Identify how an associative array is declared in PHP with a simple example. (K, CO3)
5. Name the four basic SQL data manipulation operations in CRUD. (K, CO4)

[5x2 = 10]

Part B

Short Answer Questions
Answer any 6 Questions
Each question carries 5 marks

6. Explain the basic structural tags of an HTML5 document and describe the role of the <head> and <meta> tags. (U, CO1)
7. List the four distinct layers of the CSS Box Model and describe the function of each layer. (K, CO2)
8. Describe how CSS properties are used to format typography, text alignment, and background colors of a webpage. (U, CO2)
9. Execute the steps required to configure XAMPP and run a PHP script on a local Apache server. (A, CO2)
10. Write a PHP script employing a foreach loop to traverse and display all elements of an array. (A, CO3)
11. List the built-in PHP functions used to search and sort elements in an array. (K, CO3)
12. Differentiate between mysqli_fetch_assoc() and mysqli_fetch_row() when retrieving result sets from a database query. (An, CO4)

13. Examine the role of prepared statements in PHP-MySQL and explain how parameter binding prevents SQL injection. (An, CO4)

[6x5 = 30]

Part B

Short Answer Questions
Answer any 2 Questions
Each question carries 15 marks

14. Describe in detail the creation of tables and forms in HTML. Explain the structural tags (<table>, <tr>, <td>, <th>), form methods (GET/POST), and various input elements with examples. (U, CO1)
15. Implement an interactive registration form in PHP that receives user data using $_POST, executes basic validation checks, and displays an appropriate confirmation message. (A, CO3)
16. Break down the complete process of establishing a database connection in PHP using mysqli_connect(), examine error handling using mysqli_connect_error(), and show how queries are executed securely. (An, CO4)

[2x15 = 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) FIFTH SEMESTER EXAMINATION
(2024 ADMISSION ONWARDS)

MG5DSECSC304 – Design Principles of User Computer Interaction

Duration: 2 Hrs Maximum Marks: 70

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A
Very Short Answer Questions
Answer All Questions
Each question carries 2 marks

1. List the different input-output channels involved in human-computer interaction. (K, CO1)
2. Describe the Model Human Processor (MHP). (U, CO2)
3. State Norman's seven stages of action. (K, CO3)
4. Explain any three of Shneiderman's eight golden rules of interface design. (U, CO3)
5. Define ergonomics in the context of interaction design. (K, CO4)

[5x2 = 10]

Part B
Short Answer Questions
Answer any 6 Questions
Each question carries 5 marks

6. List the three stages of human memory. (K, CO1)
7. State any four psychological principles applied in interactive system design. (K, CO1)
8. Identify the various input devices used in modern computing systems. (K, CO1)
9. Name the key design considerations for developing a navigation application for visually impaired users. (K, CO1)
10. Differentiate between heuristic evaluation and usability testing. (An, CO2)
11. Illustrate a suitable dialog design notation to represent a login interface. (A, CO3)
12. Discuss the major security considerations in human-computer interaction. (U, CO4)
13. Illustrate a framework for implementing groupware in a collaborative application. (A, CO4)

[6x5 = 30]

Part B
Short Answer Questions
Answer any 2 Questions
Each question carries 15 marks

14. Examine the process of usability testing for a task management application, comparing heuristic evaluation with contextual evaluation techniques. (An, CO2)
15. Discuss face-to-face and text-based communication in HCI, and summarize their impact on analyzing user feedback in collaborative video conferencing tools. (U, CO3)
16. Illustrate, with a suitable design, how Augmented and Virtual Reality can be employed in developing a health monitoring wearable device, addressing associated user privacy concerns. (A, CO4)

[2x15 = 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) MODEL QUESTION PAPER

Semester V

MG5DSEBCA308 - Modern Web Application Development with React.js

(*2024 ADMISSION ONWARDS*)

Duration: 2 Hours **Maximum Marks: 70**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer all questions

Each question carries **2** marks.

1. What is a Single Page Application (SPA)? [U] [CO1]
2. What is JSX? [U] [CO1]
3. A child component needs to change a piece of state that is maintained by its parent component. What React technique should be used to enable this? [A] [CO2]
4. What is conditional rendering in React? [U] [CO3]
5. What is the purpose of React Testing Library? [U] [CO4]

[2*5=10 Marks]

Part B

Short Answer Questions

Answer any 5 questions

Each question carries **6** marks.

6. Explain the component-based architecture of React.js. [U] [CO1]
7. A student wants to create a form containing Name, Email, and Age fields and display the entered values when the form is submitted. Explain how useState and controlled components can be applied to implement this form. [A] [CO2]
8. Explain how data can be fetched from an API in a React application using the Fetch API [U] [CO3]
9. Explain React Router and its role in navigation and routing in a React application. [U] [CO3]

10. Explain Context API and Redux Toolkit as approaches to state management in React. [U] [CO3]
11. Explain the main differences between REST and GraphQL. [U] [CO3]
12. Explain BEM naming convention. [U] [CO4]

[6*5=30 Marks]

Part C

Essay Questions

Answer any 2 questions

Each question carries **15** marks

13. Explain the process of setting up a React.js project [U] [CO1]
14. Explain the concept of React Hooks and the Rules of Hooks. [U] [CO2]
15. Explain the major techniques used for performance optimization in React. [U] [CO4]

[15*2=30 Marks]