MCA Sem.-3 Examination
Full Stack Web Dev
January-2024

Time : 3-00 Hours]

[Max. Marks : 50

Instructions:

(a) Write both the Section in separate answer book.
(b) Both Section having equal weightage.
(c) Draw Diagram wherever necessary.
(d) Make Assumption wherever necessary.

Section-I

Q-1. Mark True of False. [Any 5]

(5)

1. Angular provides reusable components.
2. Angular is completely based on HTML and JavaScript.
3. {{var a = 5}} This Expression is correct in Angular.
4. {{5 + 5 / 2}} This Expression is correct in Angular.
5. Variables in JavaScript are strongly typed.
6. JavaScript is not an interpreted language.

Q-2. Fill in the Blank. [Any 4]

(4)

1. AngularJs was released in year _____.
2. AngularJs was released in by _____.
3. SPA Stands for _____.
4. Angular CLI Stands for _____.
5. _____ used for two-way binding.

Q-3. Answer Following.

(6)

1. Difference Between library and Framework.
2. What is SPA? Explain with advantages and disadvantages.

Q-4. Explain Following questions. [Any two]

(10)

1. Explain Component Lifecyle with its methods.
2. Explain data-binding with example of each.
3. Explain pipes or filter in angular with example.

P.T.O

Section-II

(3)

Q-5. Give answer in one line. [Any 3]

1. What is TypeScript?
2. Give Example of Interpolation.
3. Write syntax to display <p> tag 4 times using ngFor.
4. Write code for navigate to "product/update" on button click.

(12)

Q-6. Attempt the following. [Any 4]

1. Explain Hoisting feature in JavaScript and describe how it behaves Differently with let, var and const.
2. Explain Async/Await with example.
3. Explain map, filter and reduce method of array with example.
4. List and explain built-in directives with example.
5. List and explain any three pipes with example.

(5)

Q-7. Answer the following questions.

1. In Node.js, callbacks are often used to handle _____ operations.
2. Events in Node.js are instances of the EventEmitter class. [True/False]
3. What is Console in Nodejs?
4. Node Package Manager (NPM) is used for managing and installing JavaScript packages globally. [True/False]
5. HTTP stands for _____.

Q-8. Answer the following questions. (5)

1. Explain the roles of the http and https modules in Node.js.
2. What are callbacks in Node.js, and why are they important in an asynchronous environment?

OR

1. Explain commonly used console methods in Node.js for debugging and logging?
2. How to create and handle custom events in a Node.js application using the events module?

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0101E928   Candidate's Seat No :_____

MCA Sem.-3 Examination
Deep Learning
January-2024

Time : 3-00 Hours]   [Max. Marks : 50

Instructions:

- **Write both the Sections in the separate answer book.**
- **Both Sections having equal weightage.**
- **Draw Diagrams wherever necessary.**
- **Make Assumptions wherever necessary.**

SECTION – 1

Q-1   Explain the following terms with an appropriate example:
    a.   Why do we need an activation function in neural network?   (2)
    b.   Brief the concept of generalization.   (3)

Q-2   Attempt the following: (10)
    a.   What is a Convolutional Neural Network? Explain with the help of a labelled architecture.
    b.   Explain sparse interconnections in detail using an example.

OR

Q-2   Attempt the following:
    a.   Explain ReLu activation function. Also, explain what is dying   (10)
      ReLu and how to solve it.
    b.   Explain equivariant and invariant properties of CNN.

Q-3   Attempt the following :   (10)
    a.   What do you mean by Optimization in neural network? Explain any two optimization techniques.
   b.   Explain RNN using a fully labelled architecture.

OR

Q-3   Attempt the following: (10)
    a.   What is the purpose of regularization in model training? Explain any two regularization techniques.
    b.   What is cross entropy? Explain what is the relation between maximum likelihood and cross entropy.

P.T.O

SECTION – II

Q-4   Explain the following Terms with an appropriate example.
      a.   Implement backward propagation for the following computational   **(3)**
        graph. Find $\partial Y/\partial a$, $\partial Y/\partial b$, $\partial Y/\partial c$.
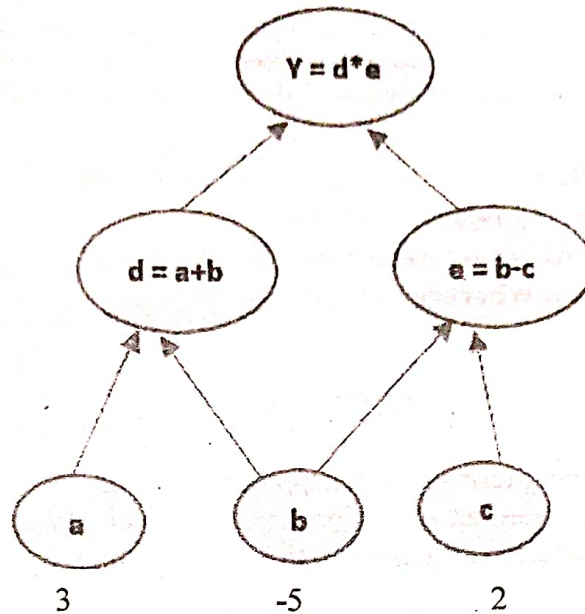
      b.   Explain what is exploding gradient problem.   **(2)**

Q-5   Attempt the following: **(10)**
      a.   Explain how GRU helps to overcome the vanishing gradient
        problem through its labelled architecture.
      b.   What is max pooling? Explain how max pooling is invariant to
        translation.

OR

Q-5   Attempt the following: **(10)**
      a.   What is model capacity? Why is it important?
      b.   Describe in brief the difference between GRU and LSTM. Which
        one is better out of the two and why?

Q-6   Attempt the following: **(10)**
      a.   Explain any five machine learning tasks.
      b.   Explain how LSTM stores long-term and short-term memories
        using architecture.

OR

Q-6   Attempt the following: **(10)**
      a.   Explain sigmoid and tanh activation functions in detail.
      b.   What are the different challenges faced in the optimization while
        training deep models?

MCA Sem.-3 Examination
Web Security
January-2024

४।५८

Time : 3-00 Hours]   [Max. Marks : 50

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

SECTION – I

Q-1   Answer the following   6

1. During a penetration test, what kind of attack is identified if JavaScript is injected into a web application's comment section?
a) Stored XSS
b) SQL Injection
c) Reflected XSS
d) CSRF Attack

2. A company's website allows file uploads but fails to check the file type server-side. What security control was bypassed?
a) Encryption
b) Server-side validation
c) Firewall
d) Intrusion Detection System

Q-2   Answer in brief   10

1. Describe the steps to perform a penetration test on a web application's login form suspected of SQL injection.

2. What steps would you take to determine if a web application is vulnerable to Command Injection via a form input?

Q-3   Attempt the following   9

Discuss the methodology for conducting a comprehensive security assessment on a web application, focusing on common vulnerabilities like SQL injection, XSS, and Command Injection.

P.T.o

SECTION – II

Q-4 **Answer the following** 6

1. A security analyst notices unusual activity on a server. What type of attack is most likely being executed?
a) DDoS Attack
b) SQL Injection
c) Command Injection
d) Phishing Attack

2. While conducting a network audit, you discover that entering a specific SQL query in the search field returns the entire customer database. What type of vulnerability is this?

a) SQL Injection
b) Buffer Overflow
c) Cross-Site Request Forgery
d) Insecure Cryptographic Storage

Q-5 **Attempt the following:** 10
1. Describe the various HTTP status codes and their significance.

2. Differentiate between TCP, HTTP and HTTPS.

Q-6 **Attempt the following:** 9

What is Burp proxy? How is it different from web browser's developer tools? Explain how to get started with Burp proxy.

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Candidate's Seat No :_____

MCA Sem.-3 Examination

Computer Vision

January-2024

Time : 3-00 Hours]

[Max. Marks : 50

SECTION I

Q1.(a)   i.   Explain computer vision system. List examples of vision using   [09]
             different bands of electro magnetic spectrum

Q2.(a)   Explain image smoothing. Write effects and convolution masks for   [08]
         following filters:

    i.   Mean

    ii.   Weighted mean

    iii.   Median

    iv.   Max

    v.   Min

OR

Q2.   With an example . Explain different types of edges   [08]

Q3.   Define segmentation. Give difference between **(any two)**   [08]
    i.   Region based and boundary based segmentation
    ii.   Structural and stochastic segmentation
    iii.   Simple and adaptive thresholding
    iv.   Region growing and region splitting and merging

SECTION II

Q4.(a)   Define morphological image processing. Explain using the following: [09]
    i.   Structuring element
    ii.   Types with examples of structuring elements
    iii.   Hits and fits

Give difference between dilation and erosion .·What effects do they have
on image? For the given image and structuring element S, find the erosion
and dilation image

P.T.o

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0	0	0	0	0	0	0	0	0	0	1	0
0	0	1	1	1	0	0	0	0	0	0	0
0	0	0	1	1	1	0	0	0	0	0	0
0	0	1	1	1	1	1	0	0	0	0	0
0	0	0	1	0	1	1	1	1	0	0	0
0	0	1	1	1	1	1	1	1	0	0	0
0	0	1	1	1	1	1	0	0	0	0	0
0	0	1	1	1	1	0	0	0	0	0	0
0	0	1	0	1	1	1	0	0	0	0	0
0	0	0	0	0	0	1	1	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

1	1	1
1	1	1
1	1	1

Q5.   Explain image negation, bit plane slicing and contrast streching   [08]

OR

Q5.   Write application of histogram equalisation . What are its effects?   [08]

Q6.   Explain different arithmetic and logical operations on images   [08]

OR

Q6.   Explain image transformations. Write the 3-D matrices and effects of rotation, translation, scaling and perspective transformation.   [08]

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MCA Sem.-3 Examination
Cloud Computing
December-2023

41

[Max. Marks : 50

Time : 3-00 Hours]

Section – 1

[08 marks]

Q1   Answer the followings in 2-3 sentences: (Any 4)
1) What do you understand by 'Autonomic Computing' ?
2) Discuss the term 'On Demand' service model.
3) Why is Multi-Tenancy model helpful in cloud computing?
4) Explain the term 'Metered Service' with reference to cloud computing.
5) When will you use private cloud over public cloud ?
6) Suppose you wish to use any online application like Reservation System for Flights, which cloud will you prefer – IAAS/PAAS/SAAS ? Why ?

[08 marks]

Q2   Do as Directed: (Any 4)
1) Discuss cloud deployment models in detail.
2) Differentiate between Cluster Computing & Grid Computing
3) Write a short note on Virtualization. Discuss type-1 and type-2 hypervisor
4) Discuss any 5 Elements of Cloud Security Model
5) Explain following terms in brief :
   (a) Database as a Service
   (b) Firewall as a Service
   (c) Backup as a Service
   (d) Identity Management as a Service
   (e) Storage as a Service

[09 marks]

Q3   Do as directed (Any 3)
1) Discuss how billing & pricing is done in AWS
2) Discuss Virtual Private Cloud in detail
3) Write a note on Simple Storage Service in detail
4) What is Serverless Computing? Discuss with reference to AWS

Section – 2

[08 marks]

Q4   Answer the followings in 2-3 sentences: (Any 4)
1) What do you understand by SLA?
2) How is Portability different from Interoperability in Cloud
3) What is PII related to privacy?
4) How is SQL different from NoSQL ?
5) Briefly, list advantages of CDN
6) State any 2 open source software used for Cloud Computing

P.T.o   1/2

[08 marks]

Q5   Do as Directed: (Any 4)

1) What is the necessity of Cloud Cube Model? Discuss 4 different parameters of cloud cube model.

2) What can be threats to the Virtualization ? Discuss atleast 3 recommendations to secure Virtualized environment.

3) Differentiate between Static Provisioning Vs. Dynamic Provisioning

4) When do we use Scaling in Cloud ? Discuss Horizontal and Vertical Scaling with suitable examples.

5) Justify that Big Data Problems can be easily solved using Cloud Technologies.

[09 marks]

Q6   Discuss AWS Services (Any 3)

1) AWS EC2
2) AWS EBS
3) AWS IAM
4) AWS Lambda
5) AWS Glacier

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Candidate's Seat No : 30029

MCA Sem.-3 Examination
Object Oriented Software Engineering
December-2023

35

Time : 3-00 Hours]

[Max. Marks : 50

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

SECTION – I

✓ Q-1	**Discuss following terms**	09	6
	a) Class		
	b) Object composition		
	c) Pair programming		
Q-2	a) Explain prototyping model with its advantages and disadvantages.	04	
	b) Discuss nature of SRS document.	04	
	OR		
✓ Q-2	a) Discuss FAST session.	04	3
	b) Draw a use-case diagram for e-shopping system for customer.	04	3
Q-3	a) Discuss Lorenz and Kidd estimation method with suitable example.	04	2
	b) Describe the framework for managing risk.	04	2
	OR		
Q-3	a) Explain types of classes identified in the class point method.	04	
	b) Draw an activity diagram for withdrawing cash from ATM.	04	

SECTION – II

Q-4	What is software quality? Explain the various software quality attributes.	09	6
Q-5	a) What is software coupling? Explain some coupling metrics with example.	04	3
	b) Discuss the characteristics of ISO 9126.	04	3
	OR		
Q-5	a) Write a brief note on CMM.	04	
	b) What is software cohesion? Explain some cohesion metrics with example.	04	
Q-6	a) Write a note on Unit testing.	04	
	b) List and explain categories of software maintenance.	04	
	OR		
Q-6	a) List down software verification techniques and explain any one.	04	4
	b) What are the challenges of software maintenance?	04	3

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MCA Sem.-3 Examination
Mobile Application Development
December-2023

25

[Max. Marks : 50

Time : 3-00 Hours]

Instructions:

(a) Use of calculators, mobiles, etc. strictly prohibited.
(b) Time allowed Max. 3 hrs

Section – I

9

[10]

Q.1 Do as Directed (Any 10)

1. ____ file explains what the application consists and glues everything together.
2. ____ method is used to stop a service in android.
3. All UI controls are derived from View class. – True/False
4. List out the methods provided by Log class in android.
5. Define context
6. What is the version name of android version 7.0?
7. Define Application class
8. Which function is used to fetch the UI widgets from Layout into java objects?
9. ____ can be used to bind data from an SQL database to a ListView in an Android application?
10. Android Studio uses the _____ system for building and managing projects.
11. The method used to retrieve data passed from one activity to another is _____.
12. The Android _____ is responsible for managing the application's life cycle.

Q.2 Explain android platform architecture with diagram. [8]

OR

4

Q.2 What are resources? List different types of resources with required directory filename and xml tag. [8]

3

Q.3 What is SQLite database? Explain methods for creating, updating, deleting and querying database records by giving a suitable example. [7]

OR

Q.3 What is Dialog? List different types of dialogs. Discuss AlertDialog with example. [7]

P.T.O

Section – II

Q.4 List and explain types of sensors available in android. **[8]**

OR

Q.4 Write Code Snippet to display minimum 3 Sensor data **[8]**

Q.5 What is intent? Differentiate between implicit and explicit intent? **[8]**

OR

Q.5 Explain Android Development Tools in detail. **[8]**

Q.6 Write Code Snippet: To display Toast Message in Activity when an item in RecyclerView is Clicked or Selected from RecyclerViewAdapter **[9]**

OR

Q.6 Write Code Snippet for the following **[9]**
1. To create Employee and Salary Table
2. Edit Salary where employee id is 3
3. Delete all Employees where salary is less then 50,000

3012E905   Candidate's Seat No : 30029

MCA Sem.-3 Examination
Enterprise Java Technologies
December-2023

Time : 3-00 Hours]   [Max. Marks : 50

Instructions:

- Write both the Sections in the separate answer book.
- Both Sections having equal weightage.
- Draw Diagrams wherever necessary.
- Make Assumptions wherever necessary.

Marks

SECTION – I

6

Q-1   Differentiate the following (Any three):
1. CGI and Servlet.
2. Servlet and JSP
3. GenericServlet and HttpServlet
4. GET and POST
5. Statement and PreparedStatement.

Q-2   Attempt Any three:

15

1. Explain Java Web Application directory structure and importance of web.xml file.

2. Pertaining to the jdbc java.sql package, what is,
   a) Connection
   b) DriverManager
   c) Statement
   d) PreparedStatement e) Resultset
   f) DatabaseMetaData g) ResultsetMetaData

3. List the different types of JDBC drivers. Compare the various driver types for their advantages and disadvantages.

4. Write a Java program to fetch and display all the records of Employee table (EmpId, EName, Email, Age).

5. Explain various Session tracking mechanisms in servlet with example.

P.T.o

Q-3   **Attempt any Four:**

1. Which of the following methods is used to perform Select statements in JDBC?
   a) executeResult()
   b) executeQuery()
   c) executeUpdate()
   d) None of the above

2. What is the return type of executeUpdate() method?
   a) int
   b) ResultSet
   c) null
   d) None of the above

3. What is the correct syntax for JSP comments?
   a) <@-- %>
   b) <%-- --%>
   c) <%-- %>
   d) None of the above

4. Is following generic serviet's life cycle steps are in order? If not, write it in order.
   1) Call init()
   2) Load and instantiate the servlet class
   3) Call destroy()
   4) Call service

5. Which of the following is advantage of using PreparedStatement in Java?
   a) Slow performance
   b) Encourages SQL injection
   c) Prevents SQL injection
   d) More memory usage

6. Stored procedure can be called by using ...
   a) CallableStatement
   b) Statement
   c) CalledStatement
   d) PreparedStatement

7. Tomcat is _____
   a) Application Server
   b) Web Server
   c) None of the above

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SECTION – II

16

Q-4   Attempt Any Four:

1. What is Servlet? Explain its advantages.
2. What is JSP? Differentiate Servlet and JSP and Explain JSF life cycle phases.
3. Define JSTL. State types of JSTL and discuss c:catch, c:import and c:param.
4. Explain use of ResultSetMetaData with example
5. What are Beans? Explain the required steps for implementing MVC with RequestDispatcher with example code.
6. Explain the MVC architecture with diagram.
7. What is session object in JSP? Show its use explain with proper example.
8. List and explain the JSP directives.

09

Q-5   Attempt Any Two:

1. Write a Java Servlet to print MCA Semester 3 Marksheet of entered enrollment number by user using JDBC.

2. Write code for servlet that will save the entered details as a new record in database table Employee with fields (EmpId, EName, Email, Age).

3. What is JSP EL? How can you access a scoped variable using expression language.

4. (a) What is Request Dispatcher? What is the difference between Request dispatcher's forward() and include() method?
    (b) List and explain the JSP implicit objects.

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