

Course: TYBCA (Sem:VI)

Course Code: 603-01

Course Title: Fundamentals of Full Stack Web Development

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Question Bank

Unit:1 Fundamentals of Angular (v17) for Single Page Applications

❖ Long Questions

1. Differentiate between components and services in Angular.
2. Explain the purpose of routing in Angular with an example.
3. Explain lazy loading with an example of Admin and User feature modules.
4. What is a Route Guard? Explain CanActivate and CanDeactivate with examples.
5. Explain the working of Route Resolvers in Angular.
6. Differentiate between Subject and BehaviorSubject with examples.
7. Explain the importance of RxJS in state handling.
11. Explain the concept of Reactive Forms with an example.
12. How is a FormArray used to generate dynamic forms?
13. Explain how to create and use custom and async validators.
14. Explain the difference between ng-template, ng-container, and ng-content.
15. Write a short note on the Smart vs Dumb component pattern.

❖ Short Questions

1. What command is used to create a new Angular project?
2. What is the purpose of CanActivate?
3. What does CanDeactivate guard do?
4. What is a feature module?
5. What is the purpose of a custom validator?
6. What is FormBuilder in Angular?
7. Name the three states of an Angular form control.
8. What is the purpose of ng-template?
9. What is a "Smart Component"?
10. What is a "Dumb Component"?
11. What is the use of ng-container?
12. What is the advantage of reusable components?
13. What is component interaction?
14. What is OnPush change detection strategy?
15. What does trackBy function do in Angular?

❖ MCQs

1. Which decorator is used to define a service in Angular?

- a) @Pipe
- b) @Component
- c) @NgModule
- d) @Injectable

Answer: d) @Injectable

2. In Angular 17, which function bootstraps a standalone component?

- a) platformBrowserDynamic()
- b) bootstrapApplication()
- c) startApp()
- d) runAngular()

Answer: b) bootstrapApplication()

3. Which CLI command creates a new standalone component?

- a) ng g c myComp --standalone
- b) ng c myComp
- c) ng new component
- d) ng make component

Answer: a) ng g c myComp --standalone

4. Which file defines the root routes in a standalone Angular 17 project?

- a) app.module.ts
- b) main.ts
- c) app.routes.ts
- d) index.html

Answer: c) app.routes.ts

5. What is the purpose of CommonModule in a feature module?

- a) Provides HTTP services
- b) Provides common directives like *ngIf* and *ngFor*
- c) Defines main component
- d) Handles routing

Answer: b) Provides common directives like ngIf and ngFor

6. Lazy loading helps to –

- a) Load all modules at once
- b) Reduce bundle size by loading modules on demand
- c) Speed up server compilation
- d) Disable routing

Answer: b) Reduce bundle size by loading modules on demand

7. Which interface protects navigation into a route?

- a) CanLoad
- b) CanDeactivate
- c) CanActivate
- d) Resolve

Answer: c) CanActivate

8. Which guard executes when navigating away from a component?

- a) CanLoad
- b) CanDeactivate
- c) CanActivate
- d) Resolve

Answer: b) CanDeactivate

9. What does a Route Resolver do?

- a) Prevents access
- b) Preloads data before activating a route
- c) Destroys route
- d) Detects route changes

Answer: b) Preloads data before activating a route

10. Which syntax defines a lazy-loaded route for AdminModule?

- a) { path:'admin', load:AdminModule }
- b) { path:'admin', loadChildren:()=>import('./admin/admin.module').then(m=>m.AdminModule) }
- c) { path:'admin', component:AdminModule }
- d) { path:'admin', module:'AdminModule' }

Answer: b)

11. In RxJS, which Subject replays the last emitted value to new subscribers?

- a) Subject
- b) BehaviorSubject
- c) AsyncSubject
- d) ReplaySubject

Answer: b) BehaviorSubject

12. Which RxJS Subject emits only the final value when completed?

- a) ReplaySubject
- b) BehaviorSubject
- c) AsyncSubject
- d) Subject

Answer: c) AsyncSubject

13. Which Angular decorator marks a class as injectable for dependency injection?

- a) @Injectable
- b) @Component
- c) @Directive
- d) @Pipe

Answer: a) @Injectable

14. In Angular guards, what should be returned to allow navigation?

- a) false
- b) Observable = false
- c) true
- d) Promise

Answer: c) true

15. What type can a guard return in Angular 17?

- a) boolean | UrlTree | Observable<boolean | UrlTree> | Promise<boolean | UrlTree>
- b) number
- c) string
- d) void

Answer: a)

16. Which class is used to group multiple form controls?

- a) FormArray
- b) FormGroup
- c) FormControl
- d) FormBuilder

Answer: b) FormGroup

17. Which Angular class helps build form controls easily?

- a) FormArray
- b) FormBuilder
- c) Validators
- d) NgForm

Answer: b) FormBuilder

18. Custom validators must return –

- a) boolean
- b) string
- c) null or an error object
- d) Promise

Answer: c) null or an error object

19. Which validator checks for required fields?

- a) Validators.email
- b) Validators.required
- c) Validators.pattern
- d) Validators.minLength

Answer: b) Validators.required

- 20. Asynchronous validators are used when –**
- a) Validation depends on API calls or server data
 - b) Form loads
 - c) Component destroys
 - d) View initializes

Answer: a)

- 21. Which directive projects content from parent to child components?**

- a) ng-template
- b) ng-content
- c) ng-container
- d) ngSwitch

Answer: b) ng-content

- 22. ng-container is mainly used to –**

- a) Render extra DOM elements
- b) Group structural directives without adding extra HTML
- c) Create services
- d) Inject dependencies

Answer: b)

- 23. In Smart vs Dumb components, Smart components –**

- a) Handle presentation only
- b) Contain business logic and state
- c) Have no services
- d) Are stateless

Answer: b)

- 24. A Shared Service is used for –**

- a) Routing only
- b) Form validation only
- c) Data sharing between components
- d) Creating pipes

Answer: c) Data sharing between components

- 25. What does ChangeDetectionStrategy.OnPush do?**

- a) Checks changes on every tick
- b) Updates view only when input references change
- c) Disables change detection
- d) Forces full tree check

Answer: b)

Unit 2: Introduction to Express.js and Server-Side Basics with Node.js

❖ **Long Questions**

1. Describe the different HTTP methods (GET, POST, PUT, DELETE) with examples.
2. Write a note on route parameters and query parameters in Express.js with suitable examples.
3. What is middleware in Express.js? Explain the difference between built-in and custom middleware.
4. Explain how nodemon helps in project development and structuring.
5. Explain the process of creating a RESTful backend using Express.js with code examples.
6. Discuss how routes are connected to controller logic in Express.js. Include an example with separate files.
7. Explain CORS and environment variables in detail. Why are they important in API development?

❖ **Short Questions**

1. What is Express.js used for in a Node.js application?
2. What is the purpose of nodemon?
3. Which HTTP method is used to update an existing resource?
4. Explain CORS ?

5. Name any one built-in middleware in Express.js.
6. What is the default port commonly used for Express servers?
7. Write any one example of a route parameter in Express.js.
8. What is the function of res.send() in Express?

❖ **MCQs**

1. Node.js is built on which JavaScript engine?

- A. SpiderMonkey
- B. V8
- C. Chakra
- D. Rhino

✓ **Answer: B**

2. Which command is used to initialize a Node.js project?

- A. node start
- B. npm init
- C. npm install
- D. node init

✓ **Answer: B**

3. Express.js is mainly used for:

- A. Database management
- B. Frontend design
- C. Building web servers and APIs
- D. Operating system tasks

✓ **Answer: C**

4. Which HTTP method is used to create data?

- A. GET
- B. POST
- C. PUT
- D. DELETE

✓ **Answer: B**

5. The command to install Express.js is:

- A. npm install express
- B. node install express
- C. install express
- D. npm get express

✓ **Answer: A**

6. Nodemon is used for:

- A. Storing data
- B. Automatically restarting server on file changes
- C. Debugging
- D. Creating routes

✓ **Answer: B**

7. Which method in Express sends a response?

- A. req.send()
- B. res.end()
- C. res.send()
- D. res.route()

✓ **Answer: C**

8. A route parameter in Express is written using:

- A. {}
- B. ()
- C. []
- D. :

✓ Answer: D

9. Which HTTP method is used to delete data?

- A. UPDATE
- B. GET
- C. DELETE
- D. POST

✓ Answer: C

10. What does CORS stand for?

- A. Cross-Origin Resource Sharing
- B. Cross-Origin Response System
- C. Client-Origin Routing System
- D. Code-Origin Resource Service

✓ Answer: A

11. Middleware in Express is used to:

- A. Design UI
- B. Execute code between request and response
- C. Store data
- D. Compile JavaScript

✓ Answer: B

12. Which middleware is used to parse JSON data?

- A. express.static
- B. express.yaml
- C. express.json
- D. express.form

✓ Answer: C

13. The default port number developers often use for local servers is:

- A. 80
- B. 3000
- C. 500
- D. 1000

✓ Answer: B

14. Query parameters are added to a URL using:

- A. @
- B. &
- C. ?
- D. #

✓ Answer: C

15. Which Express method defines a GET route?

- A. app.route()
- B. app.get()
- C. app.getRoute()
- D. app.getMethod()

✓ Answer: B

16. Which of the following is NOT an HTTP method?

- A. PUT
- B. FETCH
- C. DELETE
- D. POST

✓ Answer: B

17. Environment variables in Node.js can be accessed via:

- A. process.variables
- B. process.env
- C. env.process
- D. node.env

✓ Answer: B

18. To run a Node.js file named server.js, use:

- A. node run server.js
- B. run server.js
- C. node server.js
- D. start server.js

✓ Answer: C

19. Which command installs nodemon globally?

- A. npm install nodemon
- B. npm install -g nodemon
- C. node install nodemon -g
- D. express install nodemon

✓ Answer: B

20. The Express function used to serve static files is:

- A. express.static()
- B. express.files()
- C. express.serve()
- D. express.public()

✓ Answer: A

21. When building REST APIs, PUT is used for:

- A. Deleting resources
- B. Updating existing resources
- C. Creating resources
- D. Redirecting users

✓ Answer: B

22. Which statement is true about GET requests?

- A. GET requests modify data
- B. GET requests cannot have URLs
- C. GET requests retrieve data
- D. GET requests always require a body

✓ Answer: C

23. Route handlers in Express take which parameters?

- A. req, res
- B. request, output
- C. event, context
- D. input, result

✓ Answer: A

24. Which of the following is a custom middleware?

- A. `express.json()`
- B. `express.urlencoded()`
- C. Any user-defined function with `(req, res, next)`
- D. `express.static()`

✓ Answer: C

25. CORS is mainly used to:

- A. Speed up APIs
- B. Allow cross-domain requests
- C. Secure login systems
- D. Format JSON responses

✓ Answer: B

Unit 3: Building Web App Components and Backend Integration

❖ Long Questions

1. Explain how Express handles form submissions with an example.
2. Describe the role of models, services, and controllers in backend structuring.
3. Write a short note on sending JSON responses in Express.
4. Explain how Angular forms can be connected to Express API endpoints.
5. Explain the steps required to add email/password authentication using Firebase.
7. Explain in detail how to structure backend code using models, services, and controllers, with examples.
8. How can Angular forms be integrated with Express APIs to send and receive data? Explain with examples.
9. Describe JWT authentication workflow and how it secures Express routes.

❖ Short Questions

1. What is the purpose of handling form submissions in Express?
2. Which method in Express is typically used to extract request data?
3. What type of data does `res.json()` send?
4. Name any one component used in MVC architecture.
5. What is Firebase Authentication mainly used for?
6. In Express, which object holds form input data sent via POST?

❖ MCQs

1. What does Express use to handle form data?

- A. Controllers
- B. Routers
- C. Middleware
- D. Database drivers

✓ Answer: C

2. Which method is used to send JSON from an Express server?

- A. `res.sendJson()`
- B. `res.json()`
- C. `res.text()`
- D. `res.response()`

✓ Answer: B

3. Mongoose is primarily used for:

- A. Routing
- B. Database modeling
- C. UI designing
- D. Handling cookies

✓ Answer: B

4. Angular communicates with Express APIs using:

- A. Pipes
- B. Services (HTTPClient)
- C. Direct database calls
- D. Components

✓ **Answer: B**

5. CRUD "C" stands for:

- A. Connect
- B. Create
- C. Configure
- D. Convert

✓ **Answer: B**

6. In MVC, models are used to:

- A. Store UI
- B. Handle database structure
- C. Serve static files
- D. Render templates

✓ **Answer: B**

7. Which package is commonly used for MongoDB in Node.js?

- A. mysql
- B. sequelize
- C. mongoose
- D. firebase

✓ **Answer: C**

8. To extract POST data in Express, we use:

- A. express.xml()
- B. express.static()
- C. express.json()
- D. express.query()

✓ **Answer: C**

9. Firebase Authentication allows:

- A. Database operations
- B. Email/password login
- C. Payment processing
- D. Server hosting

✓ **Answer: B**

10. JWT is used for:

- A. Storing forms
- B. Building UI
- C. Authentication
- D. Sending emails

✓ **Answer: C**

11. Controllers are used to:

- A. Connect to MongoDB
- B. Handle business logic for requests
- C. Style components
- D. Render HTML pages

✓ **Answer: B**

12. Which command installs Mongoose?

- A. npm install mongo
- B. node install mongoose
- C. npm install mongoose
- D. install mongoose

✓ **Answer: C**

13. The purpose of Firebase Admin SDK is:

- A. Manage UI
- B. Secure backend routes
- C. Build HTML forms
- D. Send images

✓ **Answer: B**

14. The function of req.body is to:

- A. Store session
- B. Access form data
- C. Render templates
- D. Start a server

✓ **Answer: B**

15. Which CRUD operation does Model.findByIdAndUpdate() perform?

- A. Delete
- B. Read
- C. Update
- D. Create

✓ **Answer: C**

16. Which HTTP method is used to update a document?

- A. GET
- B. PUT
- C. DELETE
- D. HEAD

✓ **Answer: B**

17. Angular forms send data using:

- A. HTML only
- B. JavaScript alerts
- C. HTTP methods
- D. Firebase rules

✓ **Answer: C**

18. Firebase Authentication stores users in:

- A. MongoDB
- B. SQL server
- C. Firebase console
- D. XML files

✓ **Answer: C**

19. Which Express object represents the outgoing message?

- A. res
- B. req
- C. module
- D. data

✓ **Answer: A**

20. In Mongoose, a Schema defines:

- A. Routes
- B. Database structure
- C. HTML templates
- D. Controllers

✓ **Answer: B**

21. A token created with JWT is mostly sent in:

- A. Body
- B. URL
- C. Headers
- D. Cookies only

✓ **Answer: C**

22. MongoDB stores documents in the form of:

- A. XML
- B. YAML
- C. JSON-like objects
- D. CSV

✓ **Answer: C**

23. Which Angular service is used for making API calls?

- A. TemplateService
- B. Router
- C. HttpClient
- D. NgModel

✓ **Answer: C**

24. Firebase Admin SDK runs on:

- A. Browser
- B. Frontend
- C. Backend server
- D. CSS environment

✓ **Answer: C**

25. What is the main purpose of JWT?

- A. Storing passwords
- B. Encrypting MongoDB data
- C. Verifying user identity
- D. Hosting the backend

✓ **Answer: C**

Unit 4: Firebase and React Integration

❖ **Long Questions**

1. Explain the role of useState and useEffect hooks in React.
2. How can React fetch data from Firebase using the Firebase SDK?
3. Write short notes on Firestore collections and subcollections.
4. Describe how to deploy a frontend using Firebase Hosting.
5. Describe in detail how Firestore integrates with Angular or React applications for real-time data.
6. Explain the process of setting up Firestore, adding a collection, and performing Add/Read/Update/Delete operations.

❖ **Short Questions**

1. What is Firestore in Firebase?
2. Which command is used to create a new React app using Vite?
3. What is Firebase Hosting used for?
4. Name one type of Firebase database.
5. What is JSX?
6. Which hook is used for side effects in React?
7. What is a Firebase collection?
8. Which Firebase service is used for backend authentication in Express?

❖ **MCQs**

1. Firestore stores data in:

- A. Tables
- B. Documents & Collections
- C. Rows & Columns
- D. XML files

✓ **Answer: B**

2. Firebase Hosting is mainly used for:

- A. Backend APIs
- B. Deploying frontend applications
- C. Database management
- D. Machine learning

✓ **Answer: B**

3. Which hook is used to manage state in React?

- A. useEffect
- B. useState
- C. useHook
- D. useClass

✓ **Answer: B**

4. Which Firebase SDK is used for backend operations in Express?

- A. Firebase Desktop SDK
- B. Firebase Admin SDK
- C. Firebase Player SDK
- D. Firebase UI SDK

✓ **Answer: B**

5. To create a React app using Vite, you use:

- A. vite create react
- B. npm create vite@latest
- C. create vite-app
- D. vite-init react

✓ **Answer: B**

6. In Firestore, a document belongs to a:

- A. Schema
- B. Folder
- C. Collection
- D. Table

✓ **Answer: C**

7. Which of the following is a CRUD operation?

- A. Host
- B. Deploy
- C. Update
- D. Connect

✓ **Answer: C**

8. JSX stands for:

- A. JavaScript XML
- B. Java Syntax Extension
- C. Java XML Standard
- D. JavaScript Execution

✓ **Answer: A**

9. The React hook used for side effects is:

- A. useMemo
- B. useEffect
- C. useState
- D. useInput

✓ **Answer: B**

10. Firestore supports:

- A. Only SQL
- B. Only structured rows
- C. No real-time updates
- D. Real-time synchronization

✓ **Answer: D**

11. Firebase Realtime Database stores data as:

- A. JSON tree
- B. Key-value pairs
- C. Tables
- D. Arrays

✓ **Answer: A**

12. Which method adds data to Firestore?

- A. insert()
- B. addDoc()
- C. writeDoc()
- D. insertData()

✓ **Answer: B**

13. Which method retrieves a single Firestore document?

- A. getDoc()
- B. read()
- C. fetch()
- D. loadDoc()

✓ **Answer: A**

14. React components must return:

- A. CSS
- B. JSX
- C. JSON
- D. Strings only

✓ **Answer: B**

15. Firebase Admin SDK requires:

- A. Client credentials
- B. Private service account key
- C. Database password
- D. Browser tokens

✓ **Answer: B**

16. useEffect runs when:

- A. Only on page reload
- B. When the component loads or updates
- C. When the server restarts
- D. Only when a button is clicked

✓ **Answer: B**

17. Firestore subcollections are used for:

- A. Authentication
- B. Nested structured data
- C. Deployments
- D. Page routing

✓ **Answer: B**

18. Firestore is a:

- A. SQL database
- B. NoSQL document database
- C. Key-value local store
- D. XML datastore

✓ **Answer: B**

19. React Functional Components are defined using:

- A. Classes
- B. Objects
- C. Functions
- D. Modules

✓ **Answer: C**

20. What does Firebase Hosting provide?

- A. User login
- B. Database access
- C. CDN and SSL for websites
- D. React components

✓ **Answer: C**

21. To update a document in Firestore, you use:

- A. modifyDoc()
- B. updateDoc()
- C. changeDoc()
- D. refreshDoc()

✓ **Answer: B**

22. React apps are built using:

- A. HTML only
- B. JSX + JavaScript
- C. XML
- D. Python

✓ **Answer: B**

23. Firebase in Angular is imported using:

- A. firebase/angular-sdk
- B. AngularFire
- C. firebaseANG
- D. ngFire

✓ **Answer: B**

24. Firestore collections contain:

- A. JSON objects only
- B. Documents
- C. Tables
- D. Variables

✓ **Answer: B**

25. A common tool to bootstrap React apps is:

- A. Django
- B. Create React App
- C. Laravel
- D. Vue CLI

✓ **Answer: B**