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| **.NET Core** |  |  |
| **Question** | **Seniority Level** | **Notes** |
| 1.       What are the types of design patterns? Explain few with usage. | Junior, Mid, Senior |  |
| 2.       Name and explain the use of .Net collections types (ArrayList/Stack/Queue/Hashtable/SortedList) | Junior, Mid, Senior |  |
| 3.       Can you give few examples of SOLID principle violations (this test their understanding of SOLID) | Junior, Mid, Senior |  |
| 4.       What is garbage collection? Explain Dispose vs Finalize methods. | Junior, Mid, Senior |  |
| 5.       What is an anonymous method and where is it used? | Junior, Mid, Senior |  |
| 6.       What is interface vs abstract class? When to use interface vs abstract class? | Junior, Mid |  |
| 7.       What is Tuple in C#? | Junior, Mid, Senior |  |
| 8.       Explain Class vs Record | Junior, Mid |  |
| 9.       What is Multithreading? Explain Async/Await vs Task | Junior, Mid, Senior |  |
| 10.   What is Middleware in .net core? explain few use cases of custom middleware. | Junior, Mid, Senior |  |
| 11.   What is caching and what are its benefits? | Junior, Mid, Senior |  |
| 12.   Explain Memcache.Add vs memcache.Set Method. | Junior, Mid, Senior |  |
| 13.   Why do we need to invalidate a cache and how to invalidate? | Junior, Mid, Senior |  |
| 14.   What is Dependency Injection and what are different types of dependency injection in .net core          (Constructor/Property/Method) | Junior, Mid, Senior |  |
| 15.   Explain the Service Lifetime scopes in .net core (Singleton, scoped, transient) with scenario. | Junior, Mid, Senior |  |
| 16.   How is DI achieved in .Net Core (use of Microsoft DI vs autofac) | Junior, Mid, Senior |  |
| 17.   How do you map two objects in .Net (test the use of mapping library like AutoMapper or Mapster) | Junior, Mid, Senior |  |
| 18.   How do you do input model validation? (test the use of Data Annotations or Fluent Validation) | Junior, Mid, Senior |  |
| 19.   Difference between IEnumerable vs IQueryable | Junior, Mid, Senior |  |
| 20.   Difference between First() vs Single() in Linq? | Junior, Mid, Senior |  |
| 21.   Select vs SelectMany()? | Junior, Mid, Senior |  |
| 22.   What is the difference between .Net and .Net Core framework? | Mid, Senior |  |
| 23.   How do you implement a Singleton class | Mid, Senior |  |
| 24.   How do you relate SOLID principle with Dependency Injection? | Mid, Senior |  |
| 25.   Explain REST API in your own words. | Mid, Senior |  |
| 26.   What is the difference between Middleware (global – Authentication, Exception and Logging) and Filters (Specific to controller/action methods, address cross cutting concerns like authorization, validation,  caching) in ASP.Net Core. | Mid, Senior |  |
| 27.   Explain different Caching techniques in ASP.Net core and how to implement it? | Mid, Senior |  |
| 28.   What is the difference between Async vs Parallel calls? | Mid, Senior |  |
| 29.   How do you troubleshoot an API taking more rescponse time? (break down the system, identify which component is causing delay, Use profiling and diagnostic tools in VS to identify CPU usage and memory leaks, Identify hot code paths and optimize it) | Mid, Senior |  |
| 30.  What are aggregate function in Linq and explain few? (Aggregate, Sum, Count, Min, Max) | Mid, Senior |  |
| 31. Ask some practical coding task to test the person’s knowledge on C# syntax, ability to write safe (null checks, type safety) and maintainable code, modern C# syntax | Mid, Senior |  |
| 32. Ask practical coding task in Linq to test joins, groupby, orderby, aggregate operators, etc. | Mid, Senior |  |
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| **.NET - Entity Framework** |  |  |
| **Question** | **Seniority Level** | **Notes** |
| 1.       What is Database-First modelling vs Code-First modelling approach? Explain the pros and cons. | Junior, Mid, Senior |  |
| 2.       How do you initialize DB context? | Junior, Mid, Senior |  |
| 3.       How do you set up a Code-First project? | Junior, Mid, Senior |  |
| 4.       How do you Code first migration with an existing database         (Create models, Enable-Migrations, Add an initial migration) | Junior, Mid, Senior |  |
| 5.       How to rollback migrations in code first approach? | Junior, Mid, Senior |  |
| 6.       What is a DbSet? | Junior, Mid, Senior |  |
| 7.       How do you introduce relationship between two entities in EF core (using navigations) | Junior, Mid, Senior |  |
| 8.       How do you configure one to one/ one to many in Fluent API | Junior, Mid, Senior |  |
| 9.       How do you configure composite foreign key for an entity (either using Annotations or Fluent API) | Junior, Mid, Senior |  |
| 10.   How do you load a related entity or navigation property while querying an entity (Include – eager loading or dbcontext.entry() API). | Junior, Mid, Senior |  |
| 11.   What is the problem of single query and how split query can overcome it. | Junior, Mid, Senior |  |
| 12.   How to execute raw SQL query in efcore? | Junior, Mid, Senior |  |
| 13.   What is the benefit of AsNoTracking()? | Junior, Mid, Senior |  |
| 14.   How can we do intermediate calculations in Linq query (using let statement)? | Junior, Mid, Senior |  |
| 15.   Write a query to bulk update a property (Practical code task) | Junior, Mid, Senior |  |
| 16.   How does EFcore tracks the state of the entities while they are connected to a context. (via EntityState) | Junior, Mid, Senior |  |
| 17.   What are the different states of EntityState and what does SaveChanges() do in each state? | Junior, Mid, Senior |  |
| 18.   Does EFcore share dbcontext between different threads? Or Is DbContext thread safe? | Mid, Senior |  |
| 19.   List some performance improvement criteria for EF core (e.g., project only required properties, diable change tracking for read-only queries, use split query when returning related entities, iqueryable instead of ienumerable, use dbcontextpooling, etc). | Mid, Senior |  |
| 20.   How to enable connection resiliency and retry strategy in efcore? | Mid, Senior |  |
| 21   Ask practical coding task for joins, left joins, fluent API, etc to test person’s knowledge on syntax | Mid, Senior |  |

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| **Angular Concepts** |
| 1. Core concepts of Angular components |
| 2. Concept of modules |
| 3. Fundamentals of services and Dependency injection |
| 4. Angular life cycle hooks |
| 5. Basics of component Interaction |
| 6. How to style angular components |
| 7. How to create dynamic components |
| 8. What are directives? How structural directive and attribute directives works. |
| 9. How pipes works in angular |
| 10. Usage of Forms, like reactive forms and template driven forms, with form validation |
| 11. Using Observables and RxJs |
| 12. How NgModules works and what its components. |
| 13. Basics of HttpClient module. |
| 14. Working of angular Routing and Navigation |
| 15. Basics of server side rendering |
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| **Angular Questions** |
| Q1: What is Routing Guard in Angular? |
| Q2: What is a module, and what does it contain? |
| Q3: What are pipes? Give me an example. |
| Q4: What is a component? Why would you use it? |
| Q5: What's the difference between an Angular component and module? |
| Q6: What is a service, and when will you use it? |
| Q7: What is the equivalent of ngShow and ngHide in Angular? |
| Q8: How can I select an element in a component template? |
| Q9: What is the difference between "@Component" and "@Directive" in Angular? |
| Q10: How would you protect a component being activated through the router? |
| Q11: How would you run unit test? |
| Q12: What is the difference between Structural and Attribute directives in Angular? |
| Q13: What is the purpose of base href tag? |
| Q14: What is an observer? |
| Q15: What is an observable? |
| Q16: What are observables? |
| Q17: What is a bootstrapping module? |
| Q18: What is interpolation? |
| Q19: Explain the difference between `Promise` and `Observable` in Angular? |
| Q20: Explain the difference between "Constructor" and "ngOnInit" |
| Q21: Why should `ngOnInit` be used, if we already have a `constructor`? |
| Q22: How to bundle an Angular app for production? |
| Q23: What is difference between "declarations", "providers" and "import" in NgModule? |
| Q24: What is Reactive Programming and how to use one with Angular? |
| Q25: Why would you use a spy in a test? |
| Q26: What is TestBed? |
| Q27: What is Protractor? |
| Q28: What is the point of calling "renderer.invokeElementMethod(rendererEl, methodName)"? |
| Q29: How would you control size of an element on resize of the window in a component? |
| Q30: What is Redux and how does it relate to an Angular app? |
| Q31: When would you use eager module loading? |
| Q32: What are the Core Dependencies of Angular 7? |
| Q33: Why Incremental DOM Has Low Memory Footprint? |
| Q34: What are the ways to control AOT compilation? |
| Q35: What is Angular Universal? |
| Q36: Do I need a Routing Module always? |
| Q37: What is the purpose of Wildcard route? |
| Q38: What is activated route? |
| Q39: What is router state? |
| Q40: What is router outlet? |
| Q41: What are dynamic components? |
| Q42: Explain how custom elements works internally? |
| Q43: What are the utility functions provided by RxJS? |
| Q44: How do you perform error handling in observables? |
| Q45: What is multicasting? |
| Q46: What is subscribing? |
| Q47: How do you perform Error handling for HttpClient? |
| Q48: What is a parameterized pipe? |
| Q49: How do you categorize data binding types? |
| Q50: What happens if you use script tag inside template? |
| Q51: What are the lifecycle hooks for components and directives? |
| Q52: When should I store the "Subscription" instances and invoke `unsubscribe()` during the NgOnDestroy life cycle and when can I simply ignore them? |
| Q53: How to set headers for every request in Angular? |
| Q54: How to detect a route change in Angular? |
| Q55: What is the need for SystemJS in Angular? |
| Q56: Are there any pros/cons (especially performance-wise) in using local storage to replace cookie functionality? |
| Q57: What does "detectChanges" do in Angular jasmine tests? |
| Q58: Why would you use renderer methods instead of using native element methods? |
| Q59: What would be a good use for NgZone service? |
| Q60: What is Zone in Angular? |
| Q61: How would you insert an embedded view from a prepared TemplateRef? |
| Q62: What is ngUpgrage? |
| Q63: Name and explain some Angular Module Loading examples |
| Q64: Why would you use lazy loading modules in Angular app? |
| Q65: When does a lazy loaded module is loaded? |
| Q66: What is Ivy Renderer? Is it supported by Angular 7? |
| Q67: What is incremental DOM? How is it different from virtual DOM? |
| Q68: Why do we need compilation process? |
| Q69: What are the mapping rules between Angular component and custom element? |
| Q70: Do I need to bootstrap custom elements? |
| Q71: What is the difference between pure and impure pipe? |
| Q72: What is the difference between BehaviorSubject vs Observable? |
| Q73: What is the Angular equivalent to an AngularJS "$watch"? |
| Q74: Is there no equivalent to `$scope.emit()` or `$scope.broadcast()` in Angular? |
| Q75: Name some differences between SystemJS vs WebPack? |
| Q76: Could you provide some particular examples of using ngZone? |
| Q78: What is the default compilation for Angular 5? |
| Q79: Just-in-Time (JiT) vs Ahead-of-Time (AoT) compilation. Explain the difference. |
| Q80: Do you know how you can run angularJS and angular side by side? |
| Q81: How would you extract webpack config from angular cli project? |
| Q82: Why angular uses url segment? |
| Q83: When to use query parameters versus matrix parameters? |
| Q84: Why Incremental DOM is Tree Shakable? |
| Q85: What are observable creation functions? |
| Q87: How to handle redirects and wildcard routes in Angular? |
| Q88: When should we use the switchMap, mergeMap and concatMap in RxJS? |
| Q89: When we use zip and combineLatest and withLatestFrom ? |
| Q90: What is RxJS switchMap? |
| Q91: What all different things an RxJs stream emits. |
| Q92: What is the difference between Cold and Hot Observables in RxJS? |
| Q93: What does a subject do in RxJS and how it is different from plain observable. |
| Q94: Describe any two utility operators in RXJs |
| Q95: How can you optimize RxJS operators to improve Angular app performance? (Debouncing, Throrrling,Buffering) |
| Q96: How do Observables differ from Promises in Angular? |
| Q97: Explain the term Non Blocking in Rxjs |
| Q98: The TypeScript compiler can be configured with which file? (tsconfig.json) |
| Q99: Which are two main ways TypeScript assigns a types? (Explicit, Implicit) |
| Q100: What exactly is the router state? (Its is route tree and routerState property to get the current RouterState from anywhere in the application) |
| Q101: What are lifecycle hooks in Angular? Explain a few lifecycle hooks. |
| Q102: What is Change Detection, and how does the Change Detection Mechanism work? |
| Q103: Explain view encapsulation in Angular |

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| **Microservices** |
| **Question** |
| 1.       What is the difference between Monolith vs Microservices? When do you opt for Monolith vs             Microservices? |
| 2.       What is the purpose of Docker? |
| 3.       Why is docker recommended for Microservices? |
| 4.       What are the Microservices Architecture you have worked on? |
| 5.       What are cross cutting concerns in a microservice and how do you handle them? |
| 6.       How do you ensure resiliency in microservices? (retry mechanism using library like polly) |
| 7.       What is Repository pattern? |
| 8.       What is CQRS pattern? |
| 9.       What is API gateway pattern? |
| 10.   How do you secure/protect microservices? (OAuth implementation) |
| 11.   How do you implement communication between two services? (e.g. synchronous – rest call,            asynchronous – service bus) |
| 12.   What is SQL vs NoSQL databases and when you opt for each? |
| 13.   How do you implement transactions in Microservices? (Distributed transaction using Saga pattern is one            option) |
| 14.   What is Cohesion vs Coupling and how it translates to a better microservice? |
| 15.   What is circuit breaker mechanism and how do you implement? |
| 16.   What is Side car pattern? (used to implement cross cutting concerns) |
| 17.   How do you monitor and troubleshoot microservices? |
| 18.   What are the different web application hosting options provided by Azure with e.g.? |
| 19.   How do you troubleshoot slowness in microservices? |
| 20.   Is it better approach to have different database for different microservice or single database for all microservices? |
| 21.  Cons of micro service? |
| 22.   How to reduce or control throughput of micro service? What to keep in mind? |
| 23.   How to transfer a monolithic application to micro servi2ce? |
| 24.    What is bonded context? |
| 25.   Suppose you are moving a monolithic application to micro service in 1-year time frame.  Now you have developed 2 modules in 3 months and let’s assume 8 other modules is pending. In this scenario how will you maintain the application. (various practical examples) |
| 26.  Orchestration vs Choreography? |
| 27.  What are the rest principals you are following in your project? |
| 28.  Suppose you have developed a micro service api which has hit count 2000/s and every time this api use a third party api for data retrieval. Now your license for the third party api permits hits 1000/s. How will you handle this scenario in terms of latency? |