Unit-1

1.	What is ASP.NET Core? Explain any four features of ASP.NET Core.
2.	Draw the .NET Core architecture and explain any four components.
3.	What is .NET Core? Explain any four characteristics of .NET Core.
4.	Write and explain any five advantages of ASP.NET Core.
5.	Write two examples of server rendered UI. Explain advantages and limitations of server rendered UI.
6.	Explain client rendered UI. Discuss advantages and limitations of it.
7.	What are Blazor server and Blazor Web Assembly? Explain.
8.	Write and explain commands to create ASP.NET Core MVC project.
9.	Write and explain content of launchSettings.json file.
10.	With necessary code snippet, explain endpoint and HTML rendering.
11.	Step-by-step explain ASP.NET code snippet for controller and view to demonstrate use of “asp-action”.
12.	Explain following code snippet: `using Microsoft.AspNetCore.Mvc;` `using PartyInvites.Models;` `namespace PartyInvites.Controllers {` `public class HomeController : Controller {` `public IActionResult Index() {` `return View();` `}` `[HttpGet]` `public ViewResult RsvpForm() {` `return View();` `}` `[HttpPost]` `public ViewResult RsvpForm(GuestResponse guestResponse) {` `// TODO: store response from guest` `return View();` `}` `}` `}`
13.	Create necessary classes and demonstrate use of @model. Also discuss required ASP.NET code.
14.	With suitable example code snippet of controller, model, and view, explain validation.
15.	Develop ASP.NET Core MVC view which uses Bootstrap. With code snippet, explain any five classes of bootstap.css.
16.	Create sample Program.cs file for ASP.NET Core MVC project and explain any three statements from it.
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Unit-2

1.	How C# reduces duplication in using statement? Discuss with required code snippet and appropriate example.
2.	What is null state analysis? Explain nullable type with appropriate example and code snippet.
3.	Create ASP.NET Core controller and demonstrate use of null conditional operator and null-coalescing operator.
4.	Change the following code snippet and use null-coalescing operator. Discuss your solution. `public ViewResult Index() {` `  Product?[] products = Product.GetProducts();` `  Product? p = products[0];` `  string val;` `  if (p != null) {` `  val = p.Name;` `  } else {` `  val = "No value";` `  }` `  return View(new string[] { val });` `}`
5.	With necessary C# code snippet, explain string interpolation and collection initializer.
6.	Discuss pattern matching from following code snippet: `public ViewResult Index() {` `  object[] data = new object[] { 275M, 29.95M,` `  "apple", "orange", 100, 10 };` `  decimal total = 0;` `  for (int i = 0; i < data.Length; i++) {` `  if (data[i] is decimal d) {` `  total += d;` `  }` `  }` `  return View("Index", new string[] { $"Total: {total:C2}" });` `}`
7.	Create C# model class and explain use of extension method.
8.	Develop C# class and explain “async”, “await” with appropriate example.
9.	Write and explain sample HTTP Response status line and at least four headers.

10.	Define Cookie. List types of cookies and explain use of each type.
11.	Develop ASP.NET Core controller and demonstrate writing cookie and reading cookie.
12.	Write code snippet having CookieOptions class and explain any four properties of CookieOptions class.
13.	Explain use of following CookieOptions properties: • Domain • HttpOnly • Path • SameSite • Secure
14.	Develop ASP.NET Core application which stores the webpage visitor name in cookie and greet the user on subsequent visits to the Web application.
15.	Write steps to use session in ASP.NET Core MVC project. Discuss necessary code snippet wherever required.
16.	Write and explain any five ISession methods.
17.	What are SSL, TLS, and HTTPS? Name two attacks on HTTPS redirection. What is the possible solution?
18.	Explain three advantages and two limitations of HTTPS.
19.	Draw the diagram and explain SSL Striping attack on HTTPS redirection.
20.	Draw the diagram and explain working of HTTP Strict Transport Security.
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Unit-3

1.	Draw the diagram and explain cache read/write in computing.
2.	Discuss advantages and limitations of IMemoryCache vs IDistributedCache.
3.	Develop ASP.NET Core MVC application and demonstrate use of data caching.
4.	Explain the following code snippet:

	`` public IActionResult Index() { string? totalString; bool isExist = memoryCache.TryGetValue("result1", out totalString); if (!isExist) { int count = 1000000000; long total = 0; for (int i = 1; i <= count; i++) { total += i; } totalString = $"({DateTime.Now.ToLongTimeString()}) {total}"; var cacheEntryOptions = new MemoryCacheEntryOptions() .SetSlidingExpiration(TimeSpan.FromSeconds(30)); memoryCache.Set("result1", totalString, cacheEntryOptions); } return View("Index", totalString); } ```
5.	List and explain any five methods of IDistributedCache.
6.	With respect to distributed cache, explain “AbsoluteExpiration”, “AbsoluteExpirationRelativeToNow” and “SlidingExpiration”.
7.	Write necessary code snippet and explain any two properties of MemoryCacheOptions.
8.	Step-by-step explain how to use DistributedSqlServerCache.
9.	List and explain any four properties of SqlServerCacheOptions.
10.	What is response caching in ASP.NET Core MVC? When to use response caching? Write code snippet and explain response caching configuration.
11.	What are “Entity Framework Core” and “Object Relational Mapping”? Explain.
12.	Explain any three advantages and any two limitations of object relational mapping.
13.	Explain any five features of EF Core.
14.	What are “Code First” and “DB First” with respect to EF Core? Explain.
15.	With respect to EF Core, write commands for the following: • Uninstalling and installing Entity Framework Core Global Tool Package • Testing the Entity Framework Core Global Tool • Adding Entity Framework Core Package to a project
16.	Create C# context class and write code for AddDbContext with respect to EF Core. Also explain your solution.
17.	Step-by-step explain creating, applying migration and seeding the database.
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Unit-4

1.	What is XML Web Service? Write full form and purpose of XML, SOAP, UDDI, and WSDL.
2.	Define Web Service. Why Web Services? Discuss any two reasons.
3.	Discuss “interoperability” and “exposing an existing function on the network” related to Web Services.
4.	Draw the diagram and explain “Service Provider” and “Service Registry” role of Web Services.
5.	What is REST? Write its full form. Explain any two advantages of RESTful Web Services.
6.	Compare and differentiate SOAP with REST.
7.	Write FIVE HTTP method names along with its use in RESTful Web Services.
8.	How to install and open powershell on Mac operating system? Write commands and explain.
9.	Write and explain command(s) to send POST request from powershell to Web API.
10.	Explain any five properties of ControllerBase class.
11.	Write C# code and explain dependency injection in controller.
12.	Analyze and explain the following code snippet: `[Route("api/[controller]")]` `public class ProductsController : ControllerBase` `{` `  private DataContext context;` `  public ProductsController(DataContext ctx)` `  {` `  context = ctx;` `  }` `  [HttpGet]` `  public IEnumerable<Product> GetProducts()` `  {` `  return context.Products;` `  }` `  [HttpGet("{id}")]` `  public Product? GetProduct([FromServices]` `  ILogger<ProductsController> logger)` `  {` `  logger.LogDebug("GetProduct Action Invoked");` `  return context.Products.FirstOrDefault();` `  }`
13.	What is CORS? Write its full form. Draw the diagram and explain.
14.	What is asynchronous action? “ASP.NET Core asynchronous controller actions don’t produce responses any faster”. Discuss.
15.	How to prevent over-binding in ASP.NET Core Web API? Explain with appropriate example and code snippet.
16.	Explain following with respect to ASP.NET Core Web API:

	• Redirect( ) • RedirectToAction( ) • RedirectToActionPermanent( ) • RedirectToRoute( ) • RedirectToRoutePermanent( )
17.	Explain “omitting null properties” with appropriate example and code snippet.
18.	What is circular reference in related data? How to break it? Explain with appropriate example and diagram.
19.	Analyze following code snippet and explain “restricting the format received by an action method”. `[HttpPost]` `[Consumes("application/json")]` `public string SaveProductJson(ProductBindingTarget product) {` `  return $"JSON: {product.Name}";` `}` `[HttpPost]` `[Consumes("application/xml")]` `public string SaveProductXml(ProductBindingTarget product) {` `  return $"XML: {product.Name}";` `}`
20.	What is Swagger? Explain any four features of Swagger.
21.	Step-by-step explain installation and configuration of SwashBuckle.
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Unit-5

1.	Analyze and explain the following code written in Program.cs file: `using Microsoft.EntityFrameworkCore;` `using WebApp.Models;` `var builder = WebApplication.CreateBuilder(args);` `builder.Services.AddDbContext<DataContext>(opts => {` `  opts.UseMySql(builder.Configuration[` `  "ConnectionStrings:ProductConnection"],` `  new MySqlServerVersion(new Version()));` `  opts.EnableSensitiveDataLogging(true);` `});` `builder.Services.AddControllers();` `var app = builder.Build();` `app.UseStaticFiles();` `app.MapControllers();` `var context = app.Services.CreateScope().ServiceProvider` `  .GetRequiredService<DataContext>();` `SeedData.SeedDatabase(context);` `app.Run();`
2.	What is “convention routing”? Explain with at least two different examples.
3.	Compare and differentiate following two lines of code: • app.MapDefaultControllerRoute();

	• app.MapControllerRoute("Default", "{controller=Home}/{action=Index}/{id?}");
4.	Analyze the following code and explain “selecting view by name”. `public async Task<IActionResult> Index(long id = 1) {` `  Product? prod = await context.Products.FindAsync(id);` `  if (prod?.CategoryId == 1) {` `  return View("Watersports", prod);` `  } else {` `  return View(prod);` `  }` `}`
5.	With appropriate example, explain “Write()” and “WriteLiteral()” with respect to Razor view.
6.	Write code snippet and explain concept of “View Imports”.
7.	With respect to Razor view, explain @switch and @foreach with appropriate example and code snippet.
8.	Analyze the following code and explain “strongly typed data: viewmodel”. `@model Product` `<!DOCTYPE html>` `<html>` `<head>` `  <link href="/lib/bootstrap/css/bootstrap.min.css" rel="stylesheet" />` `</head>` `<body>` `  <h6 class="bg-secondary text-white text-center m-2 p-2">Watersports</h6>` `  <div class="m-2">` `  <table class="table table-sm table-striped table-bordered">` `  <tbody>` `  <tr><th>Name</th><td>@Model?.Name</td></tr>` `  <tr><th>Price</th><td>@Model?.Price.ToString("c")</td></tr>` `  <tr><th>Category ID</th><td>@Model?.CategoryId</td></tr>` `  <tr><th>Supplier ID</th><td>@Model?.SupplierId</td></tr>` `  </tbody>` `  </table>` `  </div>` `</body>` `</html>`
9.	What is ViewData? Write code snippet and explain how action method sets values in ViewData.
10.	ViewData is strongly typed or weakly typed? Write code snippet and explain how to access ViewData in view.
11.	What is ViewBag? How to store and retrieve String type to/from ViewBag? Explain with necessary code snippet.
12.	Discuss “type safety” and “less verbose” characteristics of ViewBag.
13.	What is the lifetime of ViewData and ViewBag? Why intellisense is not supported by ViewBag?
14.	What is TempData? Where it is stored? How to store data in TempData? Explain with code snippet.
15.	What is layout in Razor? How common layout can be used in multiple Razor view? Discuss.
16.	What is ViewStart? With appropriate example explain use of _ViewStart.cshtml file.
17.	Write code snippet and explain “selecting a layout programmatically” and

	"overriding default layout".
18.	Analyze and explain following code snippet: `@model Product` `@{` `  Layout = "_Layout";` `  ViewBag.Title = ViewBag.Title ?? "Product Table";` `}` `@section Header {` `  Product Information` `}` `<tr><th>Name</th><td>@Model?.Name</td></tr>` `<tr>` `  <th>Price</th>` `  <td>@Model?.Price.ToString("c")</td>` `</tr>` `<tr><th>Category ID</th><td>@Model?.CategoryId</td></tr>` `@section Footer {` `  @(((Model?.Price / ViewBag.AveragePrice)` `  * 100).ToString("F2"))% of average price`
19.	Write necessary code and explain use of optional layout section.
20.	Explain HTML encoding and JSON encoding with respect to Razor view.
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Unit-6

1.	What is model binding? Where default model binder looks for data values and in which sequence? Discuss.
2.	Define model binding. Explain binding simple data types with an example and code snippet.
3.	Explain binding complex data type with an example and code snippet.
4.	What is model validation? Why we need input data validation? Explain with two different examples.
5.	Write code snippet and explain any two properties of ModelState.
6.	What is implicit validation in ASP.NET Core? With appropriate example, explain two basic checks performed by implicit validation.
7.	Explain implicit validation check considering following class. `public class Product {` `  public long ProductId { get; set; }` `  public string Name { get; set; } = string.Empty;` `  [Column(TypeName = "decimal(8, 2)")]` `  public decimal Price { get; set; }`
8.	With respect to explicit validation, explain any two ModelValidationState values.
9.	Analyze the following code and explain explicit validation from it.

	`` if (ModelState.GetValidationState(nameof(Product.CategoryId)) == ModelValidationState.Valid && !context.Categories.Any(c => c.CategoryId == product.CategoryId)) { ModelState.AddModelError(nameof(Product.CategoryId), "Enter an existing category ID"); } if (ModelState.GetValidationState(nameof(Product.SupplierId)) == ModelValidationState.Valid && !context.Suppliers.Any(s => s.SupplierId == product.SupplierId)) { ModelState.AddModelError(nameof(Product.SupplierId), "Enter an existing supplier ID"); } ```
10.	With appropriate examples, explain “SetMissingBindRequiredValueAccessor” and “SetValueMustBeANumberAccessor”.
11.	Draw the diagram and explain client-side validation and server-side validation.
12.	What is client-side validation? Explain two advantages and two limitations of client-side validation.
13.	What is server-side validation? Explain two advantages and two limitations of server-side validation.
14.	Which packages are required to use client-side validation in ASP.NET Core? Write and explain code snippet for client-side validation in ASP.NET Core.
15.	What is remote validation? Explain any two advantages of it.
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