

Game Programming Question Bank.

Unit 1:

- 1) Explain in detail the Cartesian xy-plane.
- 2) Write a short note on Theorem of Pythagoras in 2D.
- 3) Write a short note on Theorem of Pythagoras in 3D.
- 4) Explain Euler's Rule with suitable example.
- 5) Explain in detail 3D vector manipulation.
- 6) Explain the following terms a. Position Vectors b. Unit Vectors c. Cartesian Vectors
- 7) How Dot product helps in Back Face Detection? OR What is back face detection problem? State and explain how dot product is used to calculate back face detection.
- 8) Explain in detail Dot or Scalar product with suitable example.
- 9) Explain in detail Cross or Vector product with suitable example.
- 10) State the difference between dot product and cross product of vectors.
- 11) State the difference between CPU and GPU architecture.
- 12) How does Dot product help in Light Intensity calculation? OR Explain how the dot product is useful in calculating lighting of an object.
- 13) Explain in detail Direction Cosine. OR Write a short note on direction cosines.
- 14) Explain the Sarrus Rule to calculate the determinants of third order.
- 15) Explain 3D translation , 3D Scaling with suitable examples.
- 16) Write a short note on 3D rotation.
- 17) Write a short note on Euler Angles.
- 18) Write a short note on 2D transformations.
- 19) What is 3D transformation? State and explain scaling and reflection in 3D.

- 20) What is transformation? State and explain the concept of translation in 2D and 3D.
- 21) Write a short note on 2D rotation.
- 22) Explain the concept of perspective projection.
- 23) Describe Cartesian xy plane and explain the concept of function graph.
- 24) Explain how to drive a unit normal vector for a triangle.
- 25) What is GPU? Why do we need GPU? How GPU is different from CPU.
- 26) Explain the architecture of GPU.
- 27) Explain the concept of homogeneous coordinates.
- 28) Define Normalization of a vector. Given a vector s as $\begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}$ in $x\ y\ z$ form obtain its normalized form.
- 29) Applying the idea of dot product obtain the angle between two vectors given $r (2,-3,4)$ and $s (5,6,10)$.
- 30) 31. Given a light source at $(20,20,40)$ and the illuminated source as $(0,10,0)$ and unit vector $n (0,1,0)$ check the visibility of the object.
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Unit 2:

1. Write a short note on SINE Rule.
2. Write a short note on COSINE Rule.
3. Explain Bernstein Polynomials.
4. Explain B-Splines and its types.

OR

Write a short note on B-splines.

5. What are Bezier Curves? How Bernstein Polynomials are used to interpolate the Bezier Curves.
6. Explain the types of Bezier Curve.

7. What is Bezier curve ? Explain quadratic bezier curve.
8. Explain the concept of swap Chain and page flipping.
9. Write a short note on depth buffering.
10. Explain the concept of multi-sampling theory. Describe how multisampling is done in Direct3D.
11. What is COM? Explain the texture and resources format in DirectX.
12. Draw and explain the stages of rendering pipeline of DirectX.
13. State and define different trigonometry ratio and inverse of trigonometric ratio.
14. What is interpolation? explain linear interpolation.
15. Explain the following interpolation
 - a. trigonometric interpolation
 - b. cubic interpolation
16. State and explain Vector Interpolation.
17. Explain the ways to examine to test whether the point is inside, outside or touching a triangle.
18. Explain Lambert's cosine law.
19. Explain the following lightning
 - a. Diffuse lighting
 - b. Ambient lighting
 - c. Specular lighting
20. State the difference between parallel light and spotlight.

21. Explain in brief magnification and minification.
22. Explain texture coordinates and state how to create and enable texture.
23. What is blending? State blend operation and blend factors.
24. What is Direct3d? Explain the resemblance between Direct3D and DirectX?
25. Explain component object model(com) and any two Interfaces provided by Direct3D?
26. Explain the Input Assembler Stage of rendering Pipeline and explain the vertices and its primitives in detail.
27. Explain Rasterization Stage in detail.
28. What is Blending? Explain the Blending equation, Blend Operations , Blend Factors and Blend State.
29. Write a Note on Blending.
30. Explain the following terms with respect to geometry:
 - a. Angles
 - b. Intercept Theorems
 - c. Golden Section
 - d. Equilateral triangle
 - e. Circle
31. Explain in brief the rendering pipeline stages with suitable diagram.

UNIT III :

1. What is Virtual Reality? Explain any two applications of it in detail.
2. What is Augmented Reality? Explain any two applications of it in detail.
3. What is Mixed Reality? Explain any two applications of it in detail.
4. State the difference between VR, AR and MR.
5. Explain in brief various scripting tools.
6. Write a short note on event scripting.

OR

Explain the execution order of Event Functions in Unity script.

7. State the difference between `update()`, `FixedUpdate()` and `LateUpdate()` method in Unity script.
8. Explain the concept of depth mapper.
9. Explain the following with respect to rendering
 - a. Mobile phones
 - b. Smart classes
 - c. HMD's
10. Explain navigation and path finding in unity engine.
11. Explain in brief the steps of creating a game in unity.
12. Explain the concept of multiplayer and networking with respect to
Unity engine.
13. Explain any 2 rendering engines from the following:

- a. 3Delight
- b. Arnold
- c. Artlantis
- d. Corona
- e. Blender

14. What are rendering engines? Explain any 2 in detail.

15. Write down the steps in Unity Installation.

16. Explain how to setup a Multiplayer Project.

17. Explain the different Render Modes used in Canvas.

18. Explain the following Visual Components:

- a. Text
- b. Image
- c. Raw Image
- d. Mask
- e. Effects

19. Explain the steps to publish the Unity project.

20. Write a short note on Physics in 3D Unity projects.

21. Explain the following Event Functions in Unity Scripting:

- a. Update Order
- b. Rendering
- c. Coroutines

22. What are Raycasters? Explain its types in brief.

23. Write a short note on Google VR platforms.

24. Write a short note on Vuforia platform.

25. State the difference between Holographic and Immersive Devices.

26. Write a short note on Oculus.

27. Write a short note on Open VR.

28. Explain in brief HTC Vive controller.

NOTE :

- **FOCUS MORE ON QUESTIONS MARKED RED .**
- **IN GAME PROGRAMMING EVERYTHING IS CONCEPTUAL**
- **DON'T THINK OF LENGTH WHILE WRITING ANSWERS**
- **FOCUS ON CONTENT .**
- **ALL THE BEST**