

(2 ½ Hours)

[Total Marks: 75]

- N.B. 1) All questions are compulsory.  
 2) Figures to the right indicate marks.  
 3) Illustrations, in-depth answers and diagrams will be appreciated.  
 4) Mixing of sub-questions is not allowed.

**Q. 1 Attempt all. (Each of 5 marks)****(A) Choose the correct alternative.****(10)**

- (i) Which one of the following transformation changes the size of the Object?  
 (a) Scaling  
 (b) Revolution  
 (c) Shearing  
 (d) Reflection
- (ii) Pitch is angle of rotation about the \_\_\_\_\_ axis  
 (a) x  
 (b) y  
 (c) z  
 (d) None
- (iii) Sum of complementary angles is  
 (a) 90 degree  
 (b) 180 degree  
 (c) 0 degree  
 (d) 270 degree
- (iv) The animation window in which animation is registered is called as \_\_\_\_\_  
 (a) Select mode  
 (b) Scene mode  
 (c) Record mode  
 (d) Edit mode
- (v) Detecting hitting of game objects against each other is achieved using \_\_\_\_\_  
 (a) Rigid body  
 (b) Box colliders  
 (c) Gravity  
 (d) Transform
- (vi) The Inspector Window shows the game object's \_\_\_\_\_  
 (a) Functions  
 (b) Property  
 (c) Benefits  
 (d) Defects
- (vii) The \_\_\_\_\_ law helps to obtain intensity of light  
 (a) Law of physics  
 (b) Euler's  
 (c) Lambert's  
 (d) Langranges's
- (viii) \_\_\_\_\_ is the technology that allows DirectX to be programming language independent and have backward compatibility.  
 (a) DirectX  
 (b) COM  
 (c) Depth buffering  
 (d) Rendering
- (ix) VR stands for \_\_\_\_\_  
 (a) Vendor Reality  
 (b) Virtual reality  
 (c) Vector Reality  
 (d) Video Reality

- (x) Configured game objects are called \_\_\_\_\_
- (a) Asset
  - (b) Factory
  - (c) Prefab
  - (d) Icon

**(B) Fill in the blanks.**

**(5)**

{Debug.log(), Linear, dot(.), Mask, Quadratic, determinant, modulus }

- (i) The symbol used to represent scalar multiplication is \_\_\_\_\_
- (ii) The notation  $\|r\|$  indicates \_\_\_\_\_ of Vector  $r$
- (iii)  $Y=mx+c$  represents \_\_\_\_\_ Function.
- (iv) The method used to send message to Unity console is \_\_\_\_\_.
- (v) The UI control not visible on screen is \_\_\_\_\_

**Q.2 Attempt the following:(ANY THREE)**

**(15)**

- (a) Describe in detail the idea of perspective projection of objects.
- (b) What is the procedure to derive a unit normal vector for a triangle.
- (c) Explain in detail scaling and translation in 3D.
- (d) Describe the Vector Product of Vectors with adequate example.
- (e) Explain the principles of direction Cosine .
- (f) Write a short note on Gimball Lock

**Q.3 Attempt the following:(ANY THREE)**

**(15)**

- (a) What are the advantages and applications of B-Spline curve
- (b) Describe the procedure to apply mesh on objects.
- (c) What is meant by Depth Buffering ?Explain.
- (d) Mention any three difference between Multisampling and Supersampling
- (e) What are the activities in the Tesslation stage in DirectX
- (f) How does the Input Assembler stage store vertices for polygon in memory?

**Q.4 Attempt the following:(ANY THREE)**

**(15)**

- (a) Explain with example the FixedUpdate() method in Unity
- (b) Explain any one VR device in detail
- (c) Explain how to create and use scripts in Unity
- (d) What are the benefits of Time.DeltaTime property in Unity
- (e) Describe the Hierarchy of execution of Event functions in Unity
- (f) How to publish a project in unity?Explain

**Q.5 Attempt the following:(ANY FIVE)**

**(15)**

- (a) Illustrate 2D Rotation about an Arbitrary Point in detail.
- (b) Describe the functionality of GPU
- (c) Explain the method XMMatrixPerspectiveFovLH() used for projection in directX.
- (d) What is the purpose of addForce() method in Unity script.
- (e) Explain the various fields in which MR technology is applied
- (f) Describe the idea of Texture in DirectX.
- (e) What are raycasters? Explain in brief.
- (f) What is an Animation clip and how it is created?

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