



# The University of Fiji



**Department of Computer Science and Information Technology**

**Semester 2 Year 2016**

**FINAL EXAMINATION PAPER**

**ITC326: Three Dimensional Design**

**Important Instructions to Students:**

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. This Final Course Examination Paper is worth 100 marks contributes 40% of the total course assessments.
6. This paper contains two (2) sections A and B. All questions are compulsory to answer.
7. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
8. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

**Examination Paper Content (Format):**

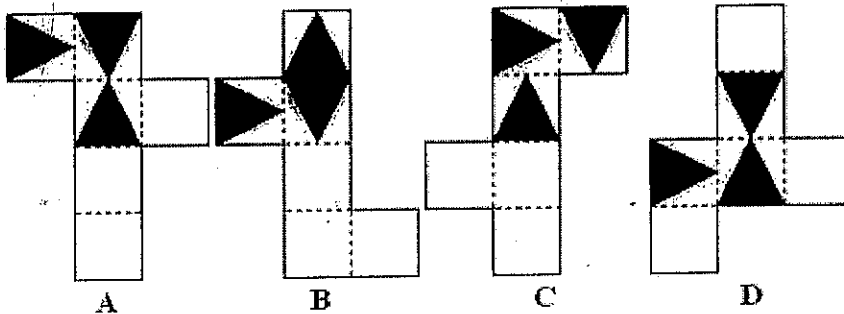
| <b><u>Section</u></b> | <b><u>Question</u></b> | <b><u>Content</u></b>  | <b><u>Marks</u></b> | <b><u>Suggested Time</u></b> |
|-----------------------|------------------------|------------------------|---------------------|------------------------------|
| <b>A</b>              | <b>1-20</b>            | Multiple Choice        | 20                  | 36 mins                      |
| <b>B</b>              | <b>1-6</b>             | Short Answer Questions | 80                  | 144 mins                     |
|                       |                        |                        |                     |                              |
|                       |                        | <b>TOTAL</b>           | <b>100</b>          | <b>180 mins</b>              |

## Section A. Multiple Choice Questions

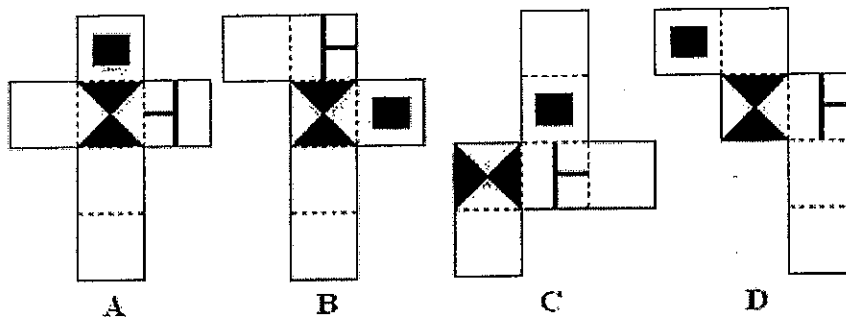
[20 marks]

1. \_\_\_\_\_ is the user-accessible programming language of Maya.
  - A. C++
  - B. C# for maya
  - C. Action script 3.0
  - D. Maya embedded Language
2. The \_\_\_\_\_ is used to create the joints and bones for a skeleton.
  - A. Bone tool
  - B. Joint tool
  - C. Skeleton tool
  - D. IK handle tool
3. The spotlight's default Cone Angle is \_\_\_\_\_ degrees.
  - A. 30
  - B. 45
  - C. 40
  - D. 55
4. Shameem is working in the hypergraph window with multiple nodes like arm\_lh, leg\_lh, leg\_rh, joint\_1, joint\_2 etc. He wants to parent two nodes named arm\_rh and root where root will be the parent node, which node should he select first.
  - A. arm\_rh
  - B. root
  - C. joint\_1
  - D. leg\_rh
5. A \_\_\_\_\_ light is often used to simulate sunlight.
  - A. Spot
  - B. Directional
  - C. Point
  - D. Direct
6. An/A \_\_\_\_\_ is a 2D object that places an image file in the scene view.
  - A. Grid
  - B. Orthographic view
  - C. Image plane
  - D. View cube

7. Which pattern can be folded to make the cube shown?



8. Which pattern can be folded to make the cube shown?



9. While working with images, you can change the \_\_\_\_\_ at any time if you want the image planes to appear more or less transparent.

- A. Color
- B. Light
- C. Alpha gain
- D. Shading

10. The drawback to using many \_\_\_\_\_ is that you'll have a harder time making smooth shape changes to broad regions.

- A. Uvalue
- B. Attributes
- C. CVs
- D. Loft

11. In \_\_\_\_\_ mode, objects appear transparent except for the simple wire outline that indicates their position and general shape.
- A. Shaded
  - B. Wireframe
  - C. x-ray
  - D. shaded on x-ray
12. Yellow represents areas of low falloff while \_\_\_\_\_ represents areas of high falloff.
- A. red
  - B. green
  - C. black
  - D. maroon
13. Area of \_\_\_\_\_ falloff are affected more by transformations to selected components than areas of \_\_\_\_\_ falloff.
- A. High, low
  - B. Low, high
  - C. Low, medium
  - D. Medium, low
14. When you \_\_\_\_\_ a polygon component, you create additional polygon components from the ones you selected.
- A. Duplicate
  - B. Extrude
  - C. Bridge
  - D. Revolve
15. While creating the profile curve, the points you clicked in the scene view become the \_\_\_\_\_ of the completed curve.
- A. UV
  - B. Edge
  - C. CV
  - D. Face
16. A \_\_\_\_\_ is a specialized piece of filmmaking and television production equipment designed to create smooth camera movements.
- A. Tripod
  - B. Camera dolly
  - C. Camera tumble
  - D. Camera

17. The \_\_\_\_\_ point specifies where the light focuses.

- A. eye
- B. look-at
- C. spot light
- D. camera lens

18. The \_\_\_\_\_ point defines the position of the light source.

- A. eye
- B. look-at
- C. spot light
- D. camera lens

19. The \_\_\_\_\_ controls the falloff around the ridge of an object. By increasing the number, you ensure that the vertices spread evenly.

- ☐ A. Control Vertex
- B. Falloff
- C. Radius
- D. Seam Tolerance

20. Maya keeps track of the options, attribute settings, and transformations made to an object via its \_\_\_\_\_ history.

- A. object
- B. outliner
- C. construction
- D. visor

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**Open Ended Questions**

**[80 marks]**

**Question 1**

**[10 marks]**

- A. Elaborate on three dimensional design and depth perception. **[2 marks]**
  - B. Differentiate between snap to grids and snap to points. **[1 mark]**
  - C. What is the purpose of the self-section in the Maya user interface? **[1 mark]**
  - D. Payaal created two models in Maya and wants to put those models in different layers. Explain her how to create a new layer and how to add the models in those layers. **[1.5 marks]**
  - E. Why is the wireframe mode faster than the shaded mode? **[0.5 mark]**
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F. Write the functionalities of the following short-cut keys.

[2 marks]

| Key | Functions |
|-----|-----------|
| w   |           |
| e   |           |
| r   |           |
| q   |           |

G. Outliner and hypergraph are two different windows but they serve similar functions. Elaborate on the similarities of these windows.

[2 marks]

## Question 2

[10 marks]

- A. Using the IK handle to pose an IK chain is generally not a good practice. Explain the statement and elaborate on the better practice. [2 marks]
- B. Before you constrain the IK handle to the control object, you need to freeze the transformations for the control object. Explain what you mean by freeze transformation and why you need to freeze the transformation. [2 marks]
- C. Belinda is working on a polygonal primitive in Maya and wanted to change the texture material from the Attribute Editor. She opened the Attribute Editor but was empty. Explain why the attribute editor is empty. [0.5 mark]
- D. Differentiate between point constraint, orient constraint and parent constraint. [3 marks]
- E. An object can have multiple constraints applied to it. The influence each constraint has on the object can be changed by modifying some attribute. Explain the attribute which needs modification. [1 mark]
- F. Shazia has completed creating the joints for the left leg and wants to create for the right one. Explain the steps to her where the joints will be created without redoing it. [1.5 marks]

## Question 3

[10 marks]

- A. While working on subdivision surfaces, explain the difference between working with polygon proxy mode and standard mode. [2 marks]
- B. "Be prepared to work as the member of a team." Elaborate on this statement. [2 marks]
- C. Lara is working on a 3d project, where she has to add lights in a room and animate it through a camera. She is bit confused on how to do this. Help Lara to:
- Add a directional and a spot light. [0.5 mark]
  - Prevent the spot light from passing through the concrete wall. [1.5 marks]
  - Add a camera in the scene. [0.5 mark]

- IV. Animate the camera to create the animation. [2 marks]
- V. Playblast and see the animation. [0.5 mark]
- VI. Do a batch render to the scene and help her to open it in after effects. [1 mark]

**Question 4** [10 marks]

- A. What is bridging in Maya (Edit Mesh > Bridge)? When using the bridge feature, you must ensure two things, explain those two things. [2 marks]
- B. Differentiate between Camera based selection and soft selection. [1 mark]
- C. In the move tools setting windows, what happens when you turn on reflection and set the reflection axis to X. [1 mark]
- D. Differentiate between surface based falloff and volume based falloff. [2 marks]
- E. What happens to the menu bar when a user toggles through the menu set? [0.5 mark]
- F. Shivanjani wants to reposition her model 100 units left and 12 units up from the origin and needs your help. Explain and help her move the object in Maya. [0.5 mark]
- G. Explain path animation and give four objects where it is used for easy animation. [2 marks]
- H. What is the function of a paint selection tool? [1 mark]

**Question 5** [20 marks]

- A. What is a pivot point? Write the process of changing the pivot position of an object in Maya? [2 marks]
- B. What are tangent handles? Explain the purpose of breaking the tangents after selecting the key. [1 mark]
- C. Explain the concept of smooth skinning/ binding in Maya. [1 mark]
- D. Farishat was working on a character and after sometime she found that the character had some deformers. Explain her the two ways to improve this can make the character look smooth. [2 marks]
- E. Explain the purpose on an ik handle tool and a control object. [2 marks]
- F. Name four types of lights used in maya apart from spot light and directional light. [2 marks]
- G. Write the process of inserting "CV" to a curve. [1 mark]

- H. Write the steps to insert edge in maya. [1 mark]
- I. What is 3d printing? Explain how the 3d printer works? [3 marks]
- J. Maya allows you to select items in different selection modes depending upon your specific needs. Name and explain the three main types of selection modes. [3 marks]
- K. What is the difference between dragging the time indicator on the time slider using the left mouse button and middle mouse button? [1 mark]
- L. What will be the duration of an animation, with a playback range of 100 to 1528, at 24 fps? [1 mark]

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**Question 6**

**[20 marks]**

- A. Differentiate between Forward Kinematics and Inverse Kinematics. [2 marks]
- B. The overall production process is divided into three major phases: preproduction, production and postproduction. Explain in detail, what happens in these three phases. [5 marks]
- C. Elaborate on the term rigging. Explain the 6 basic steps that is involved from start to end. [4 marks]
- D. After the skeleton is ready, attaching the object takes place. So while attaching the skeleton to the character and moving it, smooth skin deformation occurs at most places on the body. Explain two ways to improve the smooth skin deformations. [2 marks]
- E. Write the process of changing the pivot position of an object in Maya? [1 mark]
- F. Differentiate between Lambert and Blinn materials. [2 marks]
- G. Write the steps to create and animate a cube moving and rotating from left to right on the workspace. [4 marks]

**End of Exam**