



The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)



SCHOOL OF SCIENCE AND TECHNOLOGY
Semester 1, 2024

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 50% of the total course assessments.** Students must **at least score 40%** in this final exam to pass the course.
6. This paper contains one (1) section A. 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):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-43	Open-Ended Questions	100	180 minutes
		TOTAL	100	180 Minutes

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Registration Certificate Number (RGN0020/11)*

1. Explain the process of creating a storyboard for a short animation project. **[2 marks]**
2. Describe the various selection methods available in Maya and their appropriate use cases. **[3 marks]**
3. Explain the Outliner window and its functionalities in managing objects and their hierarchy. **[2 marks]**
4. How can you manipulate objects in Maya using transformation tools like move, rotate, and scale? **[2 marks]**
5. Discuss the different types of channels available in Maya and how they affect object properties. **[2 marks]**
6. Explain the concept of keyframes and their role in animation. How do you create and edit keyframes in Maya? **[3 marks]**
7. Describe the Graph Editor window and its functionalities in animation. **[2 marks]**
8. How can you use materials and textures to enhance the visual quality of your 3D models in Maya? **[2 marks]**
9. Explain the workflow for creating a simple hard-surface object like a chair using polygon modelling tools. **[4 marks]**
10. Discuss the importance of timing and spacing in animation. How do they affect the overall look and feel of your animation? **[2 marks]**
11. Explain the different types of lights available in Maya and their properties. **[3 marks]**
12. Explain the process of setting up a basic render scene in Maya, including camera placement and rendering settings. **[3 marks]**
13. Describe the process of modifying polygon meshes using tools like extrude, bridge, and bevel individually. How can these tools be used to create complex shapes? **[4 marks]**
14. Discuss the concept of mirroring and its applications in polygon modelling. How can mirroring help improve workflow and symmetry? **[2 marks]**
15. Explain the concept of NURBS (Non-uniform rational B-splines) and how they differ from polygon meshes in representing 3D geometry. **[2 marks]**
16. Describe the concept of NURBS lofting and its applications in creating complex shapes. How can lofting be used to model objects like pipes or airplane wings? **[3 marks]**
17. Explain the concept of forward kinematics (FK) and inverse kinematics (IK) in character animation. When would you choose FK over IK, and vice versa? **[3 marks]**

18. What is the major purpose of increasing the number of subdivisions width for a primitive object like a cube? **[1 mark]**
19. Suppose that you are creating a profile curve and one of the requirements of the design is to create a sharp point or a corner in the curve. Explain how you will accomplish this. **[1 mark]**
20. What is the purpose of the hypershade window? **[2 marks]**
21. When the plane objects are grouped, they create a hierarchy. What is a hierarchy? Name the window which helps us to view and edit the hierarchy. **[2 marks]**
22. Differentiate between Lambert and Blinn materials. **[2 marks]**
23. In the Graph Editor, what happens when you select Tangents -> Linear? **[2 marks]**
24. Write the steps to create and animate a sphere bouncing from left to right on the workspace. **[3 marks]**
25. Explain the feature of the cut face tool. **[2 mark]**
26. Explain the method of parameterization in detail. **[2 mark]**
27. Differentiate between point constraint, parent constraint, and orient constraint. **[3 marks]**
28. An object can have multiple constraints applied to it. What should be done to change the influence different constraints have on the object? **[2 marks]**
29. What is the advantage of templating the display of the objects in your scene? **[1 mark]**
30. Explain the three primary methods for manipulating the camera view in Maya. **[2 marks]**
31. What is the difference between dragging the time indicator on the time slider using the left mouse button and the middle mouse button? **[1 mark]**
32. To extrude an object, name the mode into which you will have to enter. **[1 mark]**
33. Explain the term parenting in Maya. Also identify which one is the parent node and which one is the child node from the statement called out by your instructor while parenting: "Select the node named ArmEnd and then Shift-select the node named joint4". Elaborate on your choice. **[2 marks]**
34. Explain the purpose of freeze transformation while adding a control object in the scene. **[2 marks]**
35. When editing a revolve curve, selecting the original creation curve can be challenging when it is situated amongst other existing curves and surfaces. Explain the editor which comes in useful to help the developer perform the task. **[2 marks]**
36. Differentiate between the area of low falloff and the area of high falloff. Give the colour coding which differentiates both. Explain how a developer can control the falloff size. **[2 marks]**

37. Blending between motion path and keyframe animation types is possible in Maya. What is Blending? Explain the advantage of blending. Explain how to blend the two animation types. **[3 marks]**
38. 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]**
39. Lara is working on a 3d project, where she has to add lights in a room and animate it through a camera. She is a bit confused about how to do this. Help Lara to:
- i. Add a directional and a spotlight. **[0.5 mark]**
 - ii. Prevent the spotlight from passing through the concrete wall. **[2 marks]**
 - iii. Add a camera to 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 of the scene and help her to open it in After Effects. **[1 mark]**
40. Belnda is working on a polygonal primitive in Maya and wants to change the texture material from the Attribute Editor. She opened the Attribute Editor but was empty. Explain why the attribute editor is empty. **[1 mark]**
41. An object can have multiple constraints applied to it. The influence each constraint has on the object can be changed by modifying some attributes. Explain the attribute that needs modification. **[2 mark]**
42. Shazia has completed creating the joints for the left leg and wants to create the right one. Explain the steps to her where the joints will be created without redoing it. **[2 marks]**
43. "3D Animation Market Size worth \$28.31 Billion by 2025". Write an essay focusing on Animation, entertainment, and education and the impact it will have on developing nations. **[6 marks]**

End of Exam.