

*Total number of printed pages: 02*

**UG/4<sup>th</sup>/UMCD402**

**2024**

**Rigging for 3D Animation**

*Full Marks: 100*

Time: Three hours

*The figures in the margin indicate full marks for the questions.*

*Answer any five questions.*

- |    |   |       |
|----|---|-------|
| 1. | a) Answer the following questions -   | 5 x 2 |
|    | i) What are joints?   |       |
|    | ii) What is pivot?  |       |
|    | iii) What is root joint?  |       |
|    | iv) What is skeleton?   |       |
|    | v) What is bone set up?   |       |
|    | b) What do you mean by Kinematics? Explain about FK and IK.   | 2+4+4 |
| 2. | a) List and explain the various types of constraints in Autodesk Maya.  | 10    |
|    | b) What are IK handles? Explain about RP solver and SC solver.  | 2+8   |
| 3. | Write a note on the following:  | 4x5   |
|    | i) Connection Editor  |       |
|    | ii) Component Editor  |       |
|    | iii) Hierarchy and Hypergraph   |       |
|    | iv) Lattice and cluster deformer  |       |
| 4. | a) Explain about the usage of blend shape deformer for creating different facial expression for facial rig with proper illustrations. | 10    |
|    | b) List and explain the different types of non-linear deformers.  | 10    |
| 5. | Explain the following—  | 5x4   |

- i) Direct & Indirect skinning methods
- ii) Rigid skinning & Smooth skinning
- iii) Classic smooth skinning & Dual quaternion skinning
- iv) IK FK switch with example

6. Discuss step by step stages of the character set up work flow for rigging a biped character with a proper flowchart and explanation. 10+10=20

7. Below there is a sketch of a character with construction lines and heights. Draw and label the joint chains for hand, torso and leg creating the skeletal structure with appropriate naming. Use the image for reference on where to place the joints. 20

