**PREVIEW QUESTION BANK**

**Module Name : ntr24-ed17 3D Printing and Design for Educators-ENG**
**Exam Date : 18-May-2024    Batch : 15:00-18:00**

| Sr. No. | Client Question ID | Question Body and Alternatives | Marks | Negative Marks |
|---|---|---|---|---|
| | | **Objective Question** | | |
| 1 | 15562001 | What is the primary use of Ultrasonic Additive Manufacturing (UAM) in the context of sheet lamination?<br><br>1. Bonding layers together using heat<br>2. Bonding layers together using sound<br>3. Cutting the layers into shape<br>4. Spreading the layers onto the build platform<br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| | | **Objective Question** | | |
| 2 | 15562002 | Which of the following 3D printing technologies uses a focused energy source, such as a laser, electron beam, or plasma, to melt the material?<br><br>1. Material Extrusion<br>2. Vat Polymerization<br>3. Powder Fusion<br>4. Directed Energy Deposition<br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| | | **Objective Question** | | |
| 3 | 15562003 | Which additive manufacturing process uses a recoater blade or roller to spread a thin layer of powder across a build surface?<br><br>1. Material Extrusion<br>2. Vat Polymerization<br>3. Powder Fusion<br>4. Material Jetting<br><br>A1 : 1 | 2.0 | 0.00 |

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 4 | 15562004 | | 2.0 | 0.00 |
|---|---|---|---|---|

Which of the following liquid-based 3D printing processes utilizes UV-curable photopolymers?

1. Selective Laser Sintering (SLS)
2. Fused Deposition Modeling (FDM)
3. Digital Light Processing (DLP)
4. Binder Jetting

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 5 | 15562005 | | 2.0 | 0.00 |
|---|---|---|---|---|

Which file format is commonly used to convert a CAD file into a format that can be understood by an FDM 3D printer?

1. .PDF
2. .JPEG
3. .STL
4. .OBJ

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 6 | 15562006 | | 2.0 | 0.00 |
|---|---|---|---|---|

What is the common post-processing step required for the parts printed using SLS process?

1. Curing under UV light
2. Sintering in a furnace
3. Removal of excess powder
4. Application of a liquid binder

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 7 | 15562007 | In Selective Laser Sintering (SLS), what energy source is used to fuse powdered material?<br><br>1. Ultraviolet (UV) light<br>2. Infrared (IR) light<br>3. Laser beam<br>4. Electron beam<br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 8 | 15562008 | Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).<br><br>Assertion (A) : Fused Deposition Modeling (FDM) is a popular 3D printing process for creating functional prototypes and end-use parts.<br><br>Reason (R) : FDM uses a wide range of thermoplastic materials that offer durability and strength.<br><br>Choose the *correct option*:<br><br>1. Both (A) and (R) are correct and (R) is the correct explanation of (A).<br>2. Both (A) and (R) are correct but (R) is NOT the correct explanation of (A).<br>3. (A) is correct but (R) is not correct.<br>4. (A) is not correct but (R) is correct.<br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 9 | 15562009 | What is the primary purpose of neutral file formats in CAD?<br><br>1. To enable full utilization of all features of a specific program<br>2. To facilitate easy file exchange between different CAD software<br>3. To store files specific to a particular CAD software<br>4. To provide a unique file format for each CAD software | 2.0 | 0.00 |

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 10 | 15562010 | Which of the following is an example of a native file format?<br><br>1. STEP (.stp, .step)<br>2. IGES (.igs, .iges)<br>3. AutoCAD (.dwg)<br>4. Parasolid (.x_t, .x_b)<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 11 | 15562011 | In Feature-Based Modeling (FBM), which feature is used to create a 3D object by extruding a 2D sketch along a specified path?<br><br>1. Sketch feature<br>2. Extrude feature<br>3. Revolve feature<br>4. Sweep feature<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 12 | 15562012 | Which of the following is the primary purpose of the IGES file format?<br><br>1. To store design data specific to a particular CAD software<br>2. To facilitate the exchange of 3D model data between different CAD software<br>3. To represent a solid model using primitive geometry<br>4. To provide a unique file format for each CAD software<br><br><br>A1 : 1 | 2.0 | 0.00 |

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 13 | 15562013 | Which of the following is a key advantage of the Space Decomposition method of solid representation in comparison to other methods?<br><br>1. It provides a more compact representation of complex geometry<br>2. It allows for easy modification of individual features<br>3. It supports efficient spatial queries and proximity calculations<br>4. It simplifies Boolean operations on solid models<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 14 | 15562014 | What are the two common process parameters that must be defined in nearly all 3D printing cases?<br><br>1. Infill density and support generation<br>2. Layer thickness and infill density<br>3. Print orientation and layer thickness<br>4. Support generation and print orientation<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 15 | 15562015 | What is the purpose of slicing in the 3D printing process?<br><br>1. To create support structures<br>2. To generate G-code instructions for the 3D printer<br>3. To check the quality of the STL file<br>4. To divide the 3D model into vertical layers<br><br><br>A1 : 1 | 2.0 | 0.00 |

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 16 | 15562016 | Which of the following is NOT a pre-printing task that should be checked before starting the 3D printing process? | 2.0 | 0.00 |

1. Ensuring smooth motion of the printer's X, Y, and Z axes
2. Verifying material availability and proper loading
3. Checking the G-code instructions for errors
4. Confirming build platform adhesion

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 17 | 15562017 | What is an essential safety precaution during the removal of a 3D printed part? | 2.0 | 0.00 |

1. Ensuring the various operating temperature which are sufficiently decreased
2. Checking the filament feed
3. Verifying the slicing process
4. Making sure the build platform is clean and level

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 18 | 15562018 | Which of the following is a common post-processing step for Fused Filament Fabrication (FFF) 3D printed parts? | 2.0 | 0.00 |

1. Heat treatment to strengthen the part
2. Wire EDM to detach the part from the build platform
3. Removing supports and cleaning
4. Applying a special surface treatment for residual stress management

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | |
|---|---|---|---|
| 19 | 15562019 | Which point cloud processing operation helps in reducing the number of points in the point cloud while retaining its overall shape and features?<br><br>1. Noise reduction<br>2. Registration<br>3. Down-sampling<br>4. Normal estimation<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0   0.00 |

| Objective Question | | | |
|---|---|---|---|
| 20 | 15562020 | Which algorithm is used for partitioning the point cloud into significant segments based on geometric criteria or feature similarity?<br><br>1. Region growing<br>2. Euclidean clustering<br>3. RANSAC<br>4. Region growing, Euclidean clustering and RANSAC<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0   0.00 |

| Objective Question | | | |
|---|---|---|---|
| 21 | 15562021 | Which surface reconstruction algorithm connects neighboring points and forms a mesh of connected triangles?<br><br>1. Poisson Surface Reconstruction<br>2. Ball-Pivoting Algorithm (BPA)<br>3. Marching Cubes<br>4. Poisson Surface Reconstruction, Ball-Pivoting Algorithm (BPA) and Marching Cubes<br><br><br>A1 : 1<br><br>A2 : 2 | 2.0   0.00 |

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 22 | 15562022 | Which software tool is NOT commonly used for point cloud processing?<br><br>1. Point Cloud Library (PCL)<br>2. MeshLab<br>3. CloudCompare<br>4. Adobe Illustrator<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 23 | 15562023 | In the context of 3D printing, which of the following steps is NOT a part of the reverse engineering process?<br><br>1. Capturing the physical object's geometry using a 3D scanner<br>2. Generating a point cloud or mesh model from the scanned data<br>3. Creating a CAD model based on the point cloud or mesh model<br>4. Slicing the CAD model to generate G-code instructions for the 3D printer<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 24 | 15562024 | Which of the following is NOT a step in a typical STL file repair workflow?<br><br>1. Auto-repair<br>2. Separating shells<br>3. Adjusting print resolution<br>4. Closing holes and bridging gaps<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3 | 2.0 | 0.00 |

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 25 | 15562025 | What is the main advantage of using native file formats in CAD software?<br><br>1. They are universally compatible<br>2. They can take full advantage of specific program features<br>3. They have smaller file sizes<br>4. They are suitable for 3D scanned objects<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 26 | 15562026 | What is the main purpose of STL viewers?<br><br>1. To modify the STL data<br>2. To passively view STL data<br>3. To generate support structures<br>4. To create new STL files<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | | |
|---|---|---|---|---|
| 27 | 15562027 | What is the common feature in advanced STL viewers?<br><br>1. Data modification<br>2. Re-meshing<br>3. Serial number addition<br>4. Data modification, Re-meshing and Serial number addition<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

| Objective Question | | | |
|---|---|---|---|
| 28 | 15562028 | Which file format is specifically used for 3D scanned objects?<br><br>1. OBJ<br>2. STL<br>3. PLY<br>4. IGES<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0    0.00 |

| Objective Question | | | |
|---|---|---|---|
| 29 | 15562029 | In 3D printing, what is the primary benefit of using automatic placement methods?<br><br>1. They require no user input<br>2. They position the part based on specific parameters for optimal results<br>3. They are faster than manual methods<br>4. They always produce perfect prints<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0    0.00 |

| Objective Question | | | |
|---|---|---|---|
| 30 | 15562030 | Which of the following is not a popular model for achieving optimal part orientation in 3D printing software?<br><br>1. Cost Minimization Model<br>2. Support Minimization Model<br>3. Multi-Objective Model<br>4. Surface Area Maximization Model<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0    0.00 |

| Objective Question | | | |
|---|---|---|---|

| 31 | 15562031 | Why are support structures necessary in additive manufacturing?<br><br>1. To create overhanging features<br>2. To improve the appearance of the final product<br>3. To speed up the printing process<br>4. To reduce material usage<br><br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

Objective Question

| 32 | 15562032 | In Cura software, what are the two types of support structures available?<br><br>1. Grid-type support and layer support<br>2. Column-type support and tree support<br>3. Honeycomb support and lattice support<br>4. Triangle support and square support<br><br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

Objective Question

| 33 | 15562033 | How does the support placement setting in 3D printing software affect support structures?<br><br>1. It adjusts the positioning of support structures on the model or build plate<br>2. It changes the density of the support structures<br>3. It modifies the material used for support structures<br>4. It determines the height of support structures<br><br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |

Objective Question

| 34 | 15562034 | | 2.0 | 0.00 |

What is the user-defined parameter that dictates how the CAD model is sliced?

1. Slice width
2. Slice height
3. Slice depth
4. Slice angle

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 35 | 15562035 | What is the main goal of contour organization in the slicing process? | 2.0 | 0.00 |

What is the main goal of contour organization in the slicing process?

1. To reduce build time
2. To identify exterior and interior contours
3. To minimize the staircase effect
4. To increase the surface finish

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 36 | 15562036 | | 2.0 | 0.00 |

Which of the following area-filling strategies is used in Laminated Object Manufacturing (LOM) to eliminate unwanted portions of the material?

1. Grid cutting
2. Pixel
3. Mask
4. Contour path

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 37 | 15562037 | | 2.0 | 0.00 |

In Digital Light Processing (DLP) based vat-photopolymerization, binder jetting, and material jetting processes, what directly impacts the level of detail that can be achieved during the fabrication process?

1. Slice height
2. Infill density
3. Pixel resolution
4. Raster angle

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 38 | 15562038 | Which area-filling method involves offsetting the geometry in the inward direction and is used in some specific 3D printing processes?<br><br>1. Path-based area filling<br>2. Spiral path<br>3. Contour path<br>4. Grid cutting<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 39 | 15562039 | Which of the following materials is NOT commonly used for making nozzles in FDM printers?<br><br>1. Brass<br>2. Stainless Steel<br>3. Ruby<br>4. Aluminum<br><br><br>A1 : 1<br><br>A2 : 2<br><br>A3 : 3<br><br>A4 : 4 | 2.0 | 0.00 |
| Objective Question | | | | |
| 40 | 15562040 | | 2.0 | 0.00 |

In SLA and DLP printers, what is the primary difference between the light sources used?

1. SLA uses a laser, while DLP uses a projector.
2. SLA uses a projector, while DLP uses a laser.
3. SLA and DLP both use lasers, but with different wavelengths.
4. SLA and DLP both use projectors, but with different resolutions

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 41 | 15562041 | | 2.0 | 0.00 |
|---|---|---|---|---|

Which type of 3D printer uses a print head similar to inkjet printers to selectively deposit droplets of a binding agent onto layers of powdered materials?

1. FDM Printer
2. SLA Printer
3. SLS Printer
4. Binder Jetting Printer

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 42 | 15562042 | | 2.0 | 0.00 |
|---|---|---|---|---|

Which type of extruder configuration allows for faster printing due to reduced weight near the nozzle?

1. Direct Drive
2. Bowden
3. Dual Extruders
4. Direct Drive and Dual Extruders

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 43 | 15562043 | | 2.0 | 0.00 |
|---|---|---|---|---|

What is the volumetric error in 3D printing?

1. The difference between the intended volume of the printed object as designed in the CAD model and the actual volume of the final printed part
2. The accuracy of the machine's axis movement during printing
3. The level of detail in the conversion of a CAD model to a neutral file format
4. The discrepancy between the printed part and the CAD model due to slicing

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 44 | 15562044 | | 2.0 | 0.00 |

What is the best way to minimize the conversion error when converting a CAD model to a neutral file format like STL?

1. Decreasing the resolution
2. Increasing the slice height
3. Increasing the resolution
4. Decreasing the slice height

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 45 | 15562045 | | 2.0 | 0.00 |

Which factor can contribute to volumetric errors due to toolpath inaccuracies?

1. Inadequate toolpath generation algorithms
2. Material shrinkage or expansion
3. Inaccurate CAD model conversion
4. Post-processing techniques

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | |
|---|---|---|---|---|
| 46 | 15562046 | | 2.0 | 0.00 |

How can post-processing impact the accuracy and dimensions of 3D printed parts?

1. By introducing errors during CAD model conversion
2. By causing shrinkage or deformation during post-curing or finishing processes
3. By affecting the slicing parameters and layer height
4. By altering the toolpath and infill patterns

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 47 | 15562047 | | 2.0 | 0.00 |

Which software was developed by the ISTI-CNR research center?

1. MeshLab
2. Fusion 360
3. Onshape
4. TinkerCAD

A1 : 1

A2 : 2

A3 : 3

A4 : 4

Objective Question

| 48 | 15562048 | | 2.0 | 0.00 |

Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A) : Fusion 360 integrates CAD, CAE, and CAM into a single platform.

Reason (R) : Fusion 360 is developed by Autodesk to cater to the needs of professionals and enthusiasts alike.

Choose the *most appropriate* answer:

1. Both the Assertion and Reason are true, and the Reason is the correct explanation for the Assertion.
2. Both the Assertion and Reason are true, but the Reason is not the correct explanation for the Assertion.
3. The Assertion is true, but the Reason is false.
4. The Assertion is false, but the Reason is true.

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | | |
|---|---|---|---|---|---|
| 49 | 15562049 | | | 2.0 | 0.00 |

Match the following 3D design software with their developers:

| List-I | List-II |
|---|---|
| (A) Fusion 360 | (1) Onshape Inc. |
| (B) SOLIDWORKS | (2) Autodesk |
| (C) Onshape | (3) Dassault Systèmes |

Choose the **correct** answer from the options given below:

1. A-2, B-3, C-1
2. A-3, B-2, C-1
3. A-1, B-2, C-3
4. A-1, B-3, C-2

A1 : 1

A2 : 2

A3 : 3

A4 : 4

| Objective Question | | | | | |
|---|---|---|---|---|---|
| 50 | 15562050 | | | 2.0 | 0.00 |

Which feature in Ultimaker Cura modifies the layer height based on the model's geometry?

1. Adaptive Layers
2. Tree Support
3. Infill Density
4. Print Speed

A1 : 1

A2 : 2

A3 : 3

A4 : 4