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ESC 321 Graphics and Visual Computing Block 1

Answer the following questions:

1. Identify the nature and types of Computer Graphics?

    - Computer graphics is the art and science of using computers to create and manipulate visual images. Computer graphics encompasses the creation, manipulation, and presentation of pictorial representations by computational machines to the human visual system.

      There are several types of computer graphics, including:

      a) **2D graphics** are computer graphics used for creating two-dimensional images or animations, commonly used in web design, digital art, and user interface design.
      b) **3D graphics** are utilized to create three-dimensional images or animations, commonly used in video games, movies, and architectural visualization.
      c) **Vector graphics** utilize geometrical primitives like points, lines, curves, and shapes to represent images, ensuring scalability without compromising quality.
      d) **Raster Graphics**, also known as bitmap graphics, are a widely used technique in digital photography and web graphics, utilizing a grid of pixels to represent images.
      e) **Ray Tracing** is a rendering technique that generates images by tracing light's path as pixels in an image plane, simulating light's interaction with objects.
      f) **Computer-Generated Imagery (CGI)** is a diverse range of computer graphics utilized in movies, television, and advertising to create realistic or fantastical visual effects.

2. Differentiate the distinction between Manual Drafting and Computer Graphics?

    - Manual drafting and computer graphics are both methods for visualizing ideas, but they differ significantly. Manual drafting prioritizes accessibility and tactile expression, while computer graphics focus on digital precision and can handle complex calculations but requires specific hardware. Both methods offer artistic freedom and diverse textures, but manual drafting requires careful handling and has a higher environmental impact. The choice depends on specific needs, project requirements, and creative preferences, and can be combined for optimal results.

3. What are the applications of computer graphics?

    - Some of the applications of computer graphics are:
        a) **Computer Art**, creates fine and commercial art, including animation packages, paint packages, cartoon drawing, paintings, and logo design.
        b) Computer Aided Drawing, designing buildings, automobiles, and aircraft with computer aided drawing.

c) **Presentation Graphics**, used for preparing reports, summarizing financial, statistical, mathematical, scientific, economic data, and creating bar graphs, pie charts, and time charts.
d) **Entertainment**, used in the movie and game industry for creating motion pictures, music videos, television shows, and cartoon animation films.
e) **Education** uses computer generated models to teach a wide range of concepts and fundamentals in an easy-to-understand manner.
f) **Training**, specialized systems like simulators can be used for training candidates quickly and easily.
g) **Visualization** Increases the need for visualization in advanced technologies.
h) **Image Processing** edits various types of photographs or images for better interpretation.
i) **Machine Drawing**, used for designing, modifying, and creating various parts of machines.
j) **Graphical User Interface** creates a user-friendly environment with pictures, images, icons, pop-up menus, and graphical objects.