MUTHAYAMMAL ENGINEERING COLLEGE

(An Autonomous Institution)

(Approved by AICTE, New Delhi, Accredited by NAAC & Affiliated to Anna University)
Rasipuram - 637 408, Namakkal Dist., Tamil Nadu.

Estd. 2000

IQAC

MUST KNOW CONCEPTS

MKC

RA

2021-22

Course Code & Course Name : **19RAC11 COMPUTER AIDED DESIGN & MANUFACTURING**

Year/Sem/Sec :

S.No.	Term	Notation (Symbol)	Concept / Definition / Meaning / Units / Equation / Expression	Units
Unit-I : FUNDAMENTALS OF COMPUTER GRAPHICS				
1	Design Center palette	---	Standard toolbar	---
2	F9 key	---	Snap on/off	---
3	Dragging	---	Holding down the left-hand button of the mouse on an item can be moved to another point on screen.	---
4	Tool tip	---	The tool name appearing in a rectangle when the cursor is placed on a tool icon	---
5	Isometric drawing	---	A 2D (two-dimensional) pictorial view of the object.	---
6	AutoCAD sheet set	---	A number of AutoCAD drawings saved in Paper Space format and held in a file	---
7	Term UCS stands for	---	User Coordinate System.	---
8	Phases Of Cad	---	Geometric modeling, analysis and optimization Design review and evaluation Documentation and drafting.	---
9	Geometric Modeling	---	Geometric modeling involves the use of a CAD system to develop a mathematical description of the geometry of an object.	---
10	Geometric Modeling Techniques	---	Two & Three dimensional modeling Wire frame modeling	---
11	Merits of cad	---	High productivity and reduced lead time. Accuracy in design. Modifications in design relatively easy.	---
12	Applications Cad Software package	---	Automated industries, Manufacturing companies Aerospace designs, Civil engineering plans,	---
13	Cad Software Package	---	Auto CAD, CATIA, Iron CAD, Pro-E, Turbo CAD, Solid Edge	---

14	Wireframe Modeling merits	---	Simple to construct, Designer needs little training. It needs less memory space,	---
15	B-rep	---	Consists of entering all boundary edge for all surfaces.	---
16	CSG	---	Boolean combinations or primitives solids to build a part.	---
17	Advantages Of Solid Modeling	---	It is complete and unambiguous. Automated applications like creating part program without much human involvement.	---
18	Solid works	---	Its complete product development cycle starting from concept design to Detailed design	---
19	CAM	---	Planning, Managing and Control	---
20	Plan Drawings	---	Objects drawn from above or a birds-eye view and kept two dimensional.	---
21	Wireframe	---	When drawing in plan view all drawings will be simple lines and lack any color	---
22	Images created in this CAD class utilize points		Vector - Based	---
23	Open GL	---	The fastest way to view rendered three dimensional shapes in full color	---
24	3D objects	---	X,Y,Z Axis System	---
25	Manager Design Tree	---	Part Subassembly Flexible Subassembly	---
Unit-II : GEOMETRIC MODELING				
26	BOM In Solid works	---	In Solid Works, BOM creates bill automatically and cut lists for downstream manufacturing and purchasing operation	---
27	Roles of geometric modelling	---	Analytical curves, interpolates curves, approximate curves.	---
28	Types of conic section	---	Hyperbola, elipse, parabola.	---
29	Equ. of parabola	---	Y2=4ax	---
30	Non-Parametric equation	---	X2+y2=r2	---
31	NURBS	---	Non-uniform rational B-splines	---
32	Types of surface	---	Plane, ruled, tabulated, surface of revolution, Bezier, B-spline, coons, fillet, offset	---
33	C0	---	Tangent Could Have Sudden Change In Curvature.	---
34	CSG	---	Constructive solid geometry	---
35	Euler's operation	---	V-E+F=H+2(B-G)	---
36	Product cycle	---	The process of managing the entire lifecycle of a product from starting.	---

37	Product life cycle of	---	Concept, planning, marketing, design, Manufacture service.	---
38	Concurrent engineering	---	Various tasks are handles at the same time, and not essentially in the standard order.	---
39	Computer graphics	---	Graphical representation of objects in a computer.	---
40	Rendering	---	The making of 2D model to 3D model by means of computer programs.	---
41	Anti-aliasing	---	Process for better illustration with multiple color gradations during drawing a line.	---
42	Clipping	---	It is the method of cutting a graphics display to neatly fit a predefined graphics region.	---
43	Application of solid modeling	---	Engineering, entertainment industry, medical industry	---
44	Geometry	---	It is the study of shape and spaces.	---
45	Topology	---	Unchanged after twisting, stretching.	---
46	PI	---	Primitive instancing	---
47	SWP	---	Sweep Presentations	---
48	SPRs	---	Spatial partitioning representations	---
49	Solid modeling techniques	---	Sweeping, cell decomposition	---
50	Fillet surface	---	It is a B-spline surface that blends two surface	---
Unit-III : VISUAL REALISM				
51	Rep.of curves and surfaces	---	Generic form, parametric form.	---
52	CAD tools	---	Solid works, PRO- E, CATIA, Vector works,	---
53	Computer Aided Manufacturing	CAM	Use of software and computer-controlled machinery to automate a manufacturing process	---
54	Computer Graphics	---	Is a core technology in digital photography, film, video games, cell phone	---
55	Product life cycle	---	Product goes through from when it was first thought of until it finally is removed from the market	---
56	4 Phases of the product life cycle	---	Introduction, Growth, Maturity, Decline	---
57	Morphology design	---	Morphology means 'a study of form or structure	---
58	Structure design	---	Structural design is the methodical investigation of the stability, strength and rigidity of structures	---
59	Sequential product development	---	stage of the process before passing the new product to the next department	---
60	Enforced-discipline approach	---	Discipline is the practice of making people obey rules or standards of behavior, and punishing them when they do not	---

61	Concurrent engineering	---	Method of designing and developing products, in which the different stages run simultaneously	---
62	Geometric modeling	---	The modelling of realistic objects for computer graphics and computer aided design	---
63	Solid modeling	---	Principles for mathematical and computer modeling of three-dimensional solids.	---
64	Stereoscopic imaging	---	A variety of technologies that make images and movies appear more lifelike in print, on the computer, in the cinema or on TV	---
65	Hidden line removal	HLR	Edges are not hidden by the faces of parts for a specified view and the display of parts in the projection of a model into a 2D plane	---
66	Computing silhouettes	---	Separates visible faces from invisible faces of an object with respect to a given viewing direction is called silhouette edges (or silhouettes).	---
67	Invisible face	---	Controls which edges of a 3D face are visible, allowing for accurate modeling of objects with holes	---
68	Visible face	---	A planar *face* is created that is similar to a region object. When you shade or render the object, planar *faces* are filled	---
69	Hidden line removal algorithms	HLR	Edges are not hidden by the faces of parts for a specified view and the display of parts in the projection of a model into a 2D plane	---
70	Area oriented approach	---	An object-*oriented* tool integration methodology that treats the tools as objects is presented	---
71	Depth buffer	---	computer graphics, z-buffering, also known as depth buffering, is the management of image depth coordinates in 3D graphics	---
72	Area coherence	---	Computer-graphics algorithms often take advantage of area coherence, image compression being an example	---
73	Scan line	---	It is an image-space method to identify visible surface. This method has a depth information for only single scan-line	---
74	Texture mapping	---	Application of images to three-dimensional graphics to enhance the realism of their surfaces.	---
75	Key frame	---	A key frame in animation and film making is a drawing that defines the starting and ending points of any smooth transition	---
Unit-IV : ASSEMBLY OF PARTS				
76	Assembly modelling	---	Computer software systems to handle multiple files that represent components within a product.	---
77	Constraints	---	It restricts an entity, project, or system from achieving its potential with reference to its goal	---
78	Tolerance	---	Total permissible variation of a size. It is the difference between maximum limit and minimum limit of size.	---
79	Deviation	---	The action of departing from an established course or accepted standard	---

80	Fundamental deviation	---	The minimum difference in size between a component and the basic size	---
81	Hole basis system	---	The nominal size and the limits on the hole are maintained constant and the shaft limits are varied to obtain the required fit.	---
82	Unilateral tolerance	---	A unilateral tolerance is a tolerance in which variation is permitted only in one direction from the specified dimension	---
83	Fit	---	When two parts are to be assembled the relation resulting from the difference between their sizes before assembly	---
84	Clearance fit	---	For any hole and shaft assembly, if the upper limit size of the shaft is less than the lower limit size of the hole then that type of **fit**	---
85	Interference fit	---	Is a fastening between two parts which is achieved by friction after the parts are pushed together, rather than by any other means of fastening	---
86	Transition fit	---	Transition fits are a compromise between clearance and interference fits	---
87	Depth sorting	---	An algorithm for creating a hidden-line drawing of polygon data sets by drawing the polygons from the most distant to the closest	---
88	Tolerance analysis	---	Activities related to the study of potential accumulated variation in mechanical parts and assemblies.	---
89	Tightness or looseness	---	Pixel Shading is a method used for rendering advanced graphical features such as bump mapping and shadows	---
90	Geometric progression	---	sequence of numbers where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio	---
91	Unilateral tolerance	---	tolerance in which variation is permitted only in one direction from the specified dimension	---
92	Tolerance limits	---	consist of the upper and lower limits of a particular environmental condition which allows a certain species to survive	---
93	Hidden surface	---	hidden-surface determination algorithm is a solution to the visibility problem, which was one of the first major problems in the field of 3D computer graphics	---
94	Depth Sorting	---	An algorithm for creating a hidden-line drawing of polygon data sets by drawing the polygons from the most distant to the closest, in order.	---
95	Depth buffer algorithm	---	pixel on the display screen, we keep a record of the depth of an object within the pixel that lies closest to the observer	---
96	Depth texture	---	Also known as a shadow map, is a texture that contains the data from the depth buffer for a particular scene	---

97	Shaders in unity	---	Rendering in Unity is done with Materials, Shaders and Textures	---
98	Material in unity	---	Shades are small scripts that contain the mathematical calculations and algorithm	---
99	Depth testing	---	The defects are logged, are captured across all parameters, functional and non functional	---
100	Painter's algorithm	---	Is one of the simplest solutions to the visibility problem in 3D computer graphics	---
Unit-V :CAD STANDARDS				
101	CAD Standards	---	Communication of design and Manufacturing data within engineering organization	---
102	Database Management	---	Collection of data at a single location to be used by various people for different applications	---
103	Computer graphics	---	It is used for processing image data received from the physical world.	---
104	GKS	---	Number of levels describing the level of support in terms of facilities	---
105	PHIGS	---	Programmer's Hierarchical Interface for Graphics	---
106	IGES	---	Initial Graphics Exchange Specification	---
107	STEP	---	Standard for the Exchange of Product Model data	---
108	Graphics Standards	---	allow images to be moved from machine to machine, while languages let graphics programs be moved from machine to machine	---
109	Workstation Transformation	---	If the normalized device coordinates are translated into device coordinates	---
110	Core System	---	The standardization of graphic system	---
111	Primitives	---	Pictures are considered to be constructed from a number of basic building blocks	---
112	Neutral Formats	---	IGES, STEP, DXF	---
113	Layer of STEP	---	Application Layer, Logical Layer Physical Layer	---
114	IGES File Section	---	Flag Section, Start Section, Global Section	---
115	Application Programming Interface	API	Number of function	---
116	OpenGL	---	Is a cross language, multi-platform Application Programming Interface (API) for rendering 2D and 3D vector graphics	---
117	Flag section	---	Used only with the compressed ASCII and binary format	---
118	Physical Layer	---	Deals with the data structures and data format for exchange file itself	---
119	Application Layer	---	Consist of information of various application areas	---
120	Logical Layer	---	Provide a consistent, computer-independent	---

			description of the data constructs that contain information to be exchanged	
121	CALS	---	Is an attempt to integrate text, graphics and image data into standard document architecture	---
122	Output Primitives in GKS	---	Polyline, Polymakers, Text and Fill area	---
123	IGES Problem	---	Export choices Tolerances, accuracy and resolution	---
124	GKS-3D	---	Display of 3D graphical primitives Mechanisms to obtain 3D input	---
125	GKS Cell Array	---	Array function displays raster like images in a device- independent manner	---
Placement Questions				
126	How many times are the hands of a clock at right angle in a day?		A. 22 B. 24 **C. 44** D. 48 Explanation: In 12 hours, they are at right angles 22 times. ∴ In 24 hours, they are at right angles 44 times.	
127	A train moves with a speed of 108 kmph. Its speed in metres per second is :		A.10.8 B.18 **C.30** D.38.8 Explanation:108 kmph = 108*[5/18] m/sec = 30 m/s.	
128	Determine the probability that a digit chosen at random from the digits 1, 2, 3, …12 will be odd.		Total no. of Digits = 12. Equally likely cases = 12. There are six odd digits. Probability = 6 / 12 = 1 / 2	
129	In covering a distance of 40 km, Kamlesh takes 2 hours more than Pankaj. If Kamlesh doubles his speed, then he would take 1 hour less than Pankaj. Then what is Kamlesh's speed?		A. 11 kmph **B. 5 kmph** C. 9 kmph D. 6 kmph Answer:B Explanation: Let Kamlesh's speed be x km/hr. Then, `40/x - 40/(2x) = 4` 8x = 40 x = 5 km/hr	
130	Solve the equation		A. 58 **B. 48**	

	x+34=82		C. 55 D. 60 Explanation: x=82-34=48	
131	An accurate clock shows 8 o'clock in the morning. Through how may degrees will the hour hand rotate when the clock shows 2 o'clock in the afternoon?		A.360. **B.180** C.90 D.60 Answer: B) 180 Explanation: Angle traced by the hour hand in 6 hours=(360/12)*6	
132	Excluding stoppages, the speed of a bus is 54 kmph and including stoppages, it is 45 kmph. For how many minutes does the bus stop per hour?		A. 9 **B. 10** C. 12 D. 20 Explanation: Due to stoppages, it covers 9 km less. Time taken to cover 9 km = $\frac{9}{54}$ x 60min = 10 min.	
133	Find the no., when 15 is subtracted from 7 times the no., the result is 10 more than twice of the number		Let the number be x. 7x -15 = 2x + 10 => 5x = 25 => x = 5	
134	If 0.75: x :: 5:8, then x is equal to:		A.1.12 B.1.16 **C.1.20** D.1.30 Explanation:(x * 5) = (0.75 *8) X=6/5 = 1.20	
135	Today is Monday. After 61 days, it will be :		A. Tuesday B. Monday C. Sunday **D. Saturday** Answer: D) Saturday Explanation: Each day of the week is repeated after 7 days. So, after 63 days, it will be Monday. After 61 days, it will be Saturday.	
136	Adam can do a job in 15 days; Eve can do the same job in 20		Adam can do 1/15 of the job per day Eve can do 1/20 of the job per day If they work together they can do 7/60 of the work together	

	days. If they work together for 4 days, what fraction of job is incomplete?		Remaining job 1 - 7/60 = 32/60 = 8/15	
137	Which one of the following is not a prime number?		A.31 B. 61 C. 71 **D. 91** Explanation: 91 is divisible by 7. So, it is not a prime number.	
138	Find c, if 5c - 2 = 33		**A. 7** B. 9 C. 11 D. 13 Explanation: We add 2 to both sides and get 5c-2+2=33+2, or 5c=35. We divide both sides by 5 to get c=7.	
139	A person crosses a 600 m long street in 5 minutes. What is his speed in km per hour?		A. 3.6 **B. 7.2** C. 8.4 D. 10 Explanation: Speed = 600/ 5 x 60 m/sec. = 2 m/sec. = 2 x 18/5km/hr =7.2 km/hr	
140	A and B can do a piece of work in 4 days, while C and D can do the same work in 12 days. In how many days will A, B, C and D do it together?		A, B, C and D will together take ¼ + 1/12 = 4/12 = 1/3. 3 days to complete the work.	
141	The average of five numbers is 27. If one number is excluded, the average becomes 25. The excluded number is?		A.25 **B.35** C.45 D.55 Answer:B Explanation: (27*5)-(25*4) 135-100 35	
142	The maximum gap between two successive leap year is?		A.4 **B.8** C.2 D.1 Answer: B) 8 Explanation: This can be illustrated with an example. Ex: 1896 is a leap year. The next leap	

			year comes in 1904 (1900 is not a leap year).	
144	A guy bought 10 pencils for Rs. 50 and sold them for Rs. 60.What is his gain in terms of percentage?		A. 10% B. 5% **C. 20%** D. 12% Answer:C Explanation: `"Gain%"=("Gain"/"C.P")*100=20%`	
145	Two trains starting at the same time from 2 stations 200 km apart and going in opposite direction cross each other at a distance of 110 km from one of the stations. What is the ratio of their speeds?		In the same time, they cover 110 km and 90 km respectively. For the same time, speed and distance is inversely proportional. So ratio of their speed = 110:90 = 11: 9	
146	In 100 m race, A covers the distance in 36 seconds and B in 45 seconds. In this race A beats B by:		**A. 20m** B. 25m C. 22.5m D. 9m Explanation: Distance covered by B in 9 sec. = (100/45)*9m = 20m	
147	Half percent, written as a decimal, is		A.0.2 B.0.02 **C.0.005** D.0.05 Answer: C Explanation: As we know, 1% = 1/100 Hence, (1/2)% = (1/2 * 1/100) = 1/200 = 0.005	
148	A pump can fill a tank with water in 2 hours. Because of a leak, it took 2.5 hours to fill the tank. The leak can drain all the water of the tank in:		A. 4 1/3 Hours B. 7 Hours C. 8 Hours **D. 10 Hours** Explanation: Work done by the leak in 1 hour $=\left(\frac{1}{2}-\frac{2}{5}\right)=\frac{1}{10}$. $\therefore$ Leak will empty the tank in 10 hrs.	
149	If a number is chosen at random from 1 to 100, then the		We have 1,8,27 and 64 as perfect cubes from 1 to 100. Thus, the probability of picking a perfect cube is 4/100 = 1/25	

	probability that the chosen number is a perfect cube is			
150	Three times the first of three consecutive odd integers is 3 more than twice the third. The third integer is:		A. 9 B. 11 C. 13 **D. 15** Explanation: Let the three integers be x, $x + 2$ and $x + 4$. Then, $3x = 2(x + 4) + 3 \Leftrightarrow x = 11$. $\therefore$ Third integer = $x + 4 = 15$.	

Signature

Signatures

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