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| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**SIXTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL2018 |
| **Course Code: ME308** |
| **Course Name: COMPUTER AIDED DESIGN AND ANALYSIS(Answer key)** |
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| **PART A** |
|  |  | ***Answer any three full questions, each carries 10marks.*** | Marks |
| 1 | a) | Any 5 applications | (5)  |
|  | b) | Min. 3 advantages | (3) |
|  | c) | Basic definition (1+1) Marks | (2)  |
| 2 | a) | Translation, scaling, rotation, sheer, reflection in details with equation  | ( 5) |
|  | b) | Final coordinates x’(0.366,1.366) : y’(-0.268,4.464)Result should be drawn (2+1) Marks | ( 3)  |
|  | c) | Basic definition | ( 2) |
| 3 | a) | IGES and STEP in details (21/2+21/2) Marks | ( 5)  |
|  | b) | SiggraphCORE,PHIGS,CGM,CGI.... Any Two. (21/2+21/2) Marks | ( 5) |
| 4 | a) | A line of end points (5, 8) and (6, 11) should be rotated about one of its end point (5, 8) through 30⁰ anticlockwise. For each coordinates 2 Marks and for sketch 2 Marks | ( 6) |
|  | b) | Graphical User Interface (2 Marks) , Interactive Computer Graphics (2 Marks) | ( 4)  |
| **PART B** |
| ***Answer any three full questions, each carries 10marks.*** |
| 5 | a) | Minimum 5 differences | ( 5)  |
|  | b) | Min 3 points | ( 3) |
|  | c) | Basic definition | (2) |
| 6 | a) | Half space method, Boundary representation method, CSG, Sweep representation. Any four. 2 Marks each. | ( 8)  |
|  | b) | Union , intersection, difference. Any Two. 1 Mark for each | ( 2) |
| 7 | a) | Parametric equation and explanation with expression for Bernstein function | ( 5)  |
|  | b) | Analytic surfaceSynthetic surface | ( 5) |
| 8 | a) | Definition (1 Mark), sketches(2 Marks), equations (2 Marks) | ( 5)  |
|  | b) | Definition with drawing  | ( 5) |
| **PART C** |
| ***Answer any fourfull questions, each carries 10marks.*** |
| 9 | a) | 6 steps1)Discretization2)Generation of basic data3)Determination of element stiffness matrix4)Assembly of overall stiffness matrix5)Elimination of restrained degrees of freedom6)Calculation of nodal displacement and stress  | (10 )  |
| 10 | a) | Derivation  | (10 )  |
| 11 | a) | i. d1=0, d2=0.05mm, d3=0.11mm, d4=0.21mm (4 Marks)ii. σ1=50N/mm2, σ 2=60N/mm2, σ 3=100N/mm2 (2 marks)iii. R= -30000 N (2 Marks) | ( 8)  |
|  | b) | Analysis to find out the response of a system as a function of time with respect to external disturbances.  | ( 2)  |
| 12 | a) | N1=0.4166 (2 Marks)N2=0.1111 (2 Marks)N3=0.4723 (2 Marks) | (6)  |
|  | b) | Derivation  | ( 4)  |
| 13 | a) | Explanation with relevant details for each. 2 Marks each | (6 ) |
|  | b) | Atleast two differences | ( 4) |
| 14 | a) | A=45000mm2Normal stress(x)=-879.12N/mm2Normal stress(y)=-708.18N/mm2Shear stress=341.88N/mm2Max. Normal stress(x)=-441.248N/mm2Min. Normal stress(x)=-1146.05N/mm2 | ( 8) |
|  | b) | When the shape function determining the displacement pattern and geometry are same and of same order | ( 2)  |
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