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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 surface  Synthetic 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 steps  1)Discretization  2)Generation of basic data  3)Determination of element stiffness matrix  4)Assembly of overall stiffness matrix  5)Elimination of restrained degrees of freedom  6)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=45000mm2  Normal stress(x)=-879.12N/mm2  Normal stress(y)=-708.18N/mm2  Shear stress=341.88N/mm2  Max. Normal stress(x)=-441.248N/mm2  Min. 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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