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| **Scheme of Valuation/Answer Key**(Scheme of evaluation (marks in brackets) and answers of problems/key) |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019 |
| **Course Code: ME301** |
| **Course Name: MECHANICS OF MACHINERY** |
| Max. Marks: 100 |  | Duration: 3 Hours |
| **PART A** |
|  |  | ***Answer any three full questions, each carries 10marks.*** | Marks |
| 1 | a) | Kinematic chain definition (1 mark) conditions (2 marks) | (3)  |
|  | b) | Sketch (3 marks) Proof (4 marks) | (7) |
| 2 | a) | Differences  | (2) |
|  | b) | Inversion (2 marks) Different inversions(6 marks) | (8) |
| 3 | a) | Displacement diagram (2 marks) velocity diagram(1 mark) acceleration diagram(1 mark) | (4) |
|  | b) | Explanation(2 marks)Derivation of formula of corioli’s component (3 marks)Procedure to find the direction of Corioli’s acceleration(1 marks) | (6) |
| 4 | a) | Minimum two comparisions | (4) |
|  | b) | (i) Crank angle =81.73 degrees (4 marks)(ii)Maximum velocity =3.18m/s (2 marks) | (6) |
| **PART B** |
| ***Answer any three full questions, each carries 10marks.*** |
| 5 | a) | Definition (1 mark)Advantages(2 marks) | (3 ) |
|  | b) | Figure (2 marks)1. Radius of nose = 10.7mm(1 mark)

Distance between centers = 21.3mm(1 mark)Radius of circular flank = 52.6mm(1 mark)1. Maximum acceleration during lift = 89.37m/s2(1 mark)

Maximum retardation during lift = 58.4m/s2(1 mark) | ( 7) |
| 6 | a) | Pressure angle (1 mark) Importance (1 mark) | (2) |
|  | b) | Displacement diagram (3 marks)Cam profile (3 marks)Velocity and acceleration(2 marks)maximum velocity during rise = 1.917m/smaximumaccelerationduring rise = 144.38m/s2maximum velocity during return stroke = 1.534m/smaximumaccelerationduring return stroke = 92.4m/s2 | (8) |
| 7 | a) | Naming of gear tooth profile (2 marks), Comparison (2 marks) | (4) |
|  | b) | Minimum no. of teeth on wheel = 51(1 mark)Minimum no. of teeth on pinion = 17(1 mark)Contact ratio = 1.78(4 marks) | (6) |
| 8 | a) | Interference( 2marks) methods to avoid interference(2 marks) | (4) |
|  | b) | Law of gearing(1 mark) derivation(5 marks) | (6) |
| **PART C** |
| ***Answer any four full questions, each carries 10marks.*** |
| 9 | a) | Functioning (3 marks) velocity ratio (1mark) | ( 4) |
|  | b) | (i) Speed of wheel if the annulus is fixed = 310 rpm(3marks)(ii) Speed of annulus if wheel is fixed =147.6 rpm(3marks) | (6 ) |
| 10 | a) | Listing of gear trains (1 mark) Application (2 marks) | ( 3) |
|  | b) | Neat diagram (4 marks) Explanation (3 marks) | (7) |
| 11 | a) | Precision points(2 marks) Chebychev spacing(2 marks) | (4) |
|  | b) | Definition(1mark) Various steps(5 marks) | (6) |
| 12 | a) | Explanation of graphical method  | (3) |
|  | b) | Two position(3.5 marks) three position(3.5marks) | (7) |
| 13 | a) | Definition and role (1 mark each) | (2) |
|  | b) | Finding precision point and angles (5 marks)Finding lengths (3 marks)Lengths of links = 1.73m,0.70m,1.78m and 1m | (8) |
| 14 | a) | Definition (1 mark each) | (4) |
|  | b) | Explanation (6 marks) | (6) |
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