**20EE206**

**Hall Ticket Number:**

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| **I/IV B.Tech (Regular / Supplementary) DEGREE EXAMINATION** | | | |
| **September, 2022** | **Electrical & Electronics Engineering** | | |
| **Second Semester** | **Engineering mechanics** | | |
| **Time:** Three Hours | | **Maximum:7**0 Marks | |
| ***Answer question 1 compulsory.*** | | | **(14X1 = 14 Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |

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| 1. |  | Distinguish clearly between resolution of forces and composition of forces. | CO1 | 1M |
|  |  | Define Free body diagram.. | CO1 | 1M |
|  |  | What do you understand by the term ‘parallel forces’? | CO1 | 1M |
|  |  | Distinguish clearly between like forces and unlike forces | CO2 | 1M |
|  |  | What do you mean by angle of friction? | CO2 | 1M |
|  |  | State the perpendicular axis theorem applied to moment of inertia. | CO2 | 1M |
|  |  | Give the equation for finding the moment of inertia of solid circular section about centroidal axis | CO3 | 1M |
|  |  | Differentiate between centroid and Centre of gravity | CO3 | 1M |
|  |  | If (s) is the distance traversed by a particle, then what does represent? | CO3 | 1M |
|  |  | What do you mean by rectilinear translation? | CO3 | 1M |
|  |  | Differentiate kinematics from kinetics | CO4 | 1M |
|  |  | What do you mean by curvilinear translation? | CO4 | 1M |
|  |  | What is mass moment of inertia of flywheel having a mass of 8000 kg and a radius of gyration of 60 cm. | CO4 | 1M |
|  |  | State D’Alembert’s principle | CO4 | 1M |
| UNIT - I | | |  |  |
| 2. | a) | The members of a truss are pin connected at joint O. Determine the magnitude of F1 and its angle for equilibrium. Set F2 = 6 kN. | CO1 | 7M |
|  | b) | State Parallelogram law and Prove it. | CO1 | 7M |
| (OR) | | | | |
| 3. |  | Determine the location of the centroid C of the beam having the cross-sectional area shown. | CO1 | 14M |
| **P.T.O**  **20EE206**  UNIT - II | | | | |
| 4. |  | Find the moment of inertia about the centroidal X-X and Y-Y axes of the angle section shown in Fig. | CO2 | 14M |
|  |  | Or |  |  |
| 5. |  | A 4 m ladder weighing 250 N is placed against a smooth vertical wall with its lower end 1.5 m away from the wall. If the coefficient of friction between the ladder and the floor is 0.3, show that the adder will remain in equilibrium in this position. | CO2 | 14M |
|  |  | UNIT - III |  |  |
| 6. |  | A train is uniformly accelerated and passes successive kilometre stones with velocities of 18 kmph. and 36 kmph. respectively. Calculate the velocity, when it passes the third kilometre stone. Also find the time taken for each of these two intervals of one kilometre. | CO3 | 14M |
|  |  | (OR) |  |  |
| 7. |  | The equation for angular displacement of a particle, moving in acircular path (radius 200 m) is given by : θ = 18t + 3t2 – 2t3 where θ is the angular displacement at the end of t sec. Find (i) angular velocity and acceleration at start, (ii) time when the particle reaches its maximum angular velocity; and (iii) maximum angular velocity of the particle. | CO3 | 14M |
|  |  | UNIT - IV |  |  |
| 8. | a) | Determine the mass moment of inertia of the solid sphere about its centroidal axis. | CO4 | 14M |
|  |  | (OR) |  |  |
| 9. | a) | The disk starts at = 1 rad/s when , and is given an angular acceleration , where is in radians. Determine the magnitudes of the normal and tangential components of acceleration of a p oint P on the rim of the disk when = 1 rev. | CO4 | 14M |

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