Can a Physics expert Please help me with this take home exam?. Questions 13-25. Thanks.

. Question 13 4 pts A uniform disk, with mass M = 6.0 kg and radius 0.50 m, is mounted on a fixed horizontal axle. A block with a mass m = 2.0 kg hangs from a massless cord that is wrapped around the rim of the disk. The block is released from rest. What are the acceleration of the falling block and the tension in the cord. 6.0 m / s2 ; 18 N 5.3 m / s2 ; 15.9 N − 4.5 m / s2 ; 9.0 N 3.92 m / s2 ; 11.76 N 2.45 m / s2 ; 7.35 N Flag this Question

Question 14 4 pts A solid sphere is rolling smoothly with a speed of 6.0 m/s on a horizontal surface. It then rolls up a ramp to a maximum height of h and stops. Calculate this maximum height. (The moment of inertia of a solid sphere is I = (2/5) m R2 6.50 m 1.79 m 7.14 m 2.57 m 9.83 m Flag this Question

Question 15 4 pts A uniform disk of 10 kg and radius 4.0 m can rotate in a horizontal plane about a vertical axis through its center. The disk is rotating at an angular velocity of 15 rad/s when a 5-kg package is dropped vertically on a point that is 2.0 m from the center of the disk. What is the angular velocity of the disk/package system? 12 rad/s 8.0 rad/s 15 rad/s 20 rad/s 10 rad/s Flag this Question

Question 16 4 pts A wrench is used to tighten a nut as shown in the figure. A 12-N force is applied 7.0 cm from the axis of rotation. What is the magnitude of the torque due to the applied force? 0.58 N ⋅ m 0.84 N ⋅ m 1.71 N ⋅ m 58 N ⋅ m 14 N ⋅ m Flag this Question

Question 17 4 pts A horizontal, 10-m plank weighs 150 N. It rests on two supports that are placed 1.0 m from each end as shown in the figure. How close to one end can an 800-N person stand without causing the plank to tip? 0.25 m 0.7 m 0.5 m 0.3 m 0.9 m Flag this Question

Question 18 4 pts Consider the following four objects: a hoop, a flat disk, a solid sphere, and a hollow sphere. Each of the objects has mass M and radius R. The axis of rotation passes through the center of each object, and is perpendicular to the plane of the hoop and the plane of the flat disk. Which of these objects requires the largest torque to give it the same angular acceleration? the hoop the solid sphere the hollow sphere both the solid and the hollow spheres the flat disk Flag this Question

Question 19 4 pts A 6.0-m board is resting directly on top of a 6.0-m long table. The weight of the board is 400 N. An object with a weight of 150 N is placed at the right end of the board. What is the maximum horizontal distance that the board can be moved toward the right such that the board remains in equilibrium? 3.2 m 0.82 m 4.0 m 2.18 m 1.6 m Flag this Question

Question 20 4 pts Two solid disks, which are free to rotate independently about the same axis that passes through their centers and perpendicular to their faces, are initially at rest. The two disks have the same mass, but one of has a radius R and the other has a radius 3R. A force of magnitude F is applied to the edge of the smaller radius disk and it begins rotating. What force must be applied to the edge of the larger disk so that the angular acceleration is the same as that for the larger disk? Express your answer in terms of the force F applied to the smaller disk. 6 F 0.50 F 9 F 3 F (1/3) F Flag this Question

Question 21 4 pts The corner of a rectangular piece of wood is attached to a rod that is free to rotate as shown. The length of the longer side of the rectangle is 4.0 m and the length of the shorter side is 2 m. Two equal forces with magnitudes of 22 N are applied to two of the corners. What is the magnitude of the net torque on the block and direction of rotation, if any? 22 N.m counterclockwise 66 N.m clockwise 88 N.m clockwise 66 N.m counterclockwise 44 N.m clockwise Flag this Question

Question 22 4 pts A spherical shell is rolling without slipping at constant speed on a level floor. What percentage of the shell's total kinetic energy is translational kinetic energy? 29 % 60 % 71 % 30 % 53 % Flag this Question Question

23 4 pts While excavating the tomb of Tutankhamen (d. 1325 BC), archeologists found a sling made of linen. The sling could hold a stone in a pouch, which could then be whirled in a horizontal circle. The stone could then be thrown for hunting or used in battle. Imagine the sling held a 0.10-kg stone; and it was whirled at a radius of 1.5 m with an angular speed of 2.0 rev/s. What was the angular momentum of the stone under these circumstances? 0.45 J.s 0.90 J.s 0.14 J.s 0.25 J.s 0.15 J.s Flag this Question

Question 24 4 pts The propeller of an airplane was rotating at 6\pi π rad/s when the pilot increased the speed at a constant angular acceleration. Two seconds later, the propeller is rotating at 24\pi π rad/s. Through how many revolutions has the propeller rotated through during the first two seconds? 10 revolutions 15 revolutions 5 revolutions 20 revolutions 30 revolutions Flag this Question

Question 25 4 pts The Earth, which has an equatorial radius of 6380 km, makes one revolution on its axis every 23.93 hours. What is the tangential speed of Fayetteville, NC, whose latitude is 35o N? 198 m/s 381 m/s 465 m/s 415 m/s 283 m/s

Add a textbook

Add a textbook