Force and Ib b.

1. Which of the following sets of horizontal forces could leave an object in equilibrium? a. 25, 50 and 100 N b. 5, 10, 20 and 50 N c. 8, 16, and 32 N d. 20, 20 and 20 N 2. Which of the following sets of horizontal forces could not leave an object in equilibrium? a. 6, 8 and 10 lb b. 10, 10 , and 10 lb c. 10, 20 and 30 lb d. 20, 40 and 80 lb 3. If an object is free to move in a plane, the number of scalar equations that must be satisfied for it to be in equilibrium is a. 2 b. 3 c. 4 d. 6 4. If an object is free to move in three dimensions, the number of scalar equations that must be satisfied for it to be in equilibrium is a. 2 b. 3 c. 4 d. 6 5. An object in equilibrium may not have a. Any forces acting on it b. Any torques acting on it c. Velocity d. Acceleration 6. Two ropes are used to support a stationary weight W. The tensions in the ropes must a. Each be W/2 b. Each be W c. Have a vector sum of magnitude W d. Have a vector sum of magnitude greater that W 7. A weight is suspended from the middle of a rope whose ends are at the same level. In order for the ends of the rope to be perfectly horizontal, the forces applied to the ends of the rope a. Must be equal to the weight b. Must be greater than the weight c. Might be so great as to break the rope d. Must be infinite in magnitude 8. If the sum of the torques on an object in equilibrium is zero about a certain point, it is a. Zero abput no other point b. Zero about some other points c. Zero about all other points d. Any of the above, depending on the situation 9. In an equilibrium problem the point about which torques are computed a. Must pass through one end of the object b. Must pass through the object's center of gravity c. Must intersect the line of action of at least one force acting on the object d. May be located anywhere 10. The center of gravity of an object a. Is always at its geometrical center b. Is always in the interior of

the object c. May be outside the object d. Is sometimes arbitrary 11. An object of mass m is moving at the speed v toward another object, also of mass m, that is at rest. The speed of the center of gravity of the system is a. v/2 b. v c. 2v d. v2 12. Which of the following cannot be increased by using a machine of some kind? a. Force b. Torque c. Speed d. Work 13. The minimum number of pulleys in a block and tackle needed to achieve an IMA of 6 is a. 3 b. 4 c. 5 d. 6 14. The highest IMA that can be obtained with a system of two pulleys us a. 1 b. 2 c. 3 d. 4 15. A 100 lb box is suspended by a rope from a overhead support. If a horizontal force of 58 lb is applied to the box, the rope will make an angle with the vertical of a. 30 degree b. 45 degree c. 60 degree d. 75 degree 16. A 5. 0 N picture is supported by two strings that run from its upper corners to a nail on the wall. If each string makes a 40 degree angle with the vertical, the tension in each is a. 3. 3 N b. 3. 9 N c. 5. 0 N d. 10. 0 N 17. The system shown in fig. 8. 34 is in equilibrium. The mass of A is a. 0. 5 kg b. 1kg c. 2 kg d. 2kg 18. A weight of 1. 9 kN is suspended from the end of a horizontal strut 1. 5m long that projects from a wall. A supporting cable 2. 5 m long goes from the end of the strut to a point on the wall 2. 0 m above the strut. The tension in the cable is a. 0. 8 kN b. 1. 0 kN c. 1. 25 kN d. 1. 67 kN 19. The inward force the strut in multiple choice no. 18 exerts on the wall is a. 0. 75 kN b. 0. 94 kN c. 1. 25 kN d. 1. 34 kN 20. A 60 kg object is attached to one end of a 40 kg steel tube 2. 4m long. The distance from the loaded end to the balance point is a. 48 cm b. 60 cm c. 80 cm d. 160 cm 21. A uniform wooden plank 2. 0 m long that weighs 200 N is supported by a sawhorse 400 mm from one end. What downward force on the end nearest the sawhorse is needed to keep the plank level? a. 200 N b.

300 N c. 500 N d. 800 N 22. The entire 200 lb weight of a door 2. 00 m high and 0. 80 m wide is supported by a hinge at a lower corner. The force the door exerts on the hinge at the top corner is a. 200 lb b. 204 lb c. 215 lb d. 240 lb 23. The force the door of multiple choice no. 22 exerts on the lower hinger is a. 200 lb b. 204 lb c. 215 lb d. 240 lb 24. A person pries up one end of a 400 lb crate with a steel pipe 6. 0 ft long. If the force exerted is 50 lb, the distance of the fulcrum from the crate is a. 4 in b. 8 in c. 9 in d. 16 in 25. One end of a plank 4. 0 m long is supported 1. 0 m above the ground. A 10 kg box on frictionless wheels is placed on the plank. The force parallel to the plank needed to keep the box stationary is a. 25 N b. 95 N c. 98 N d. 0. 39 kN 26. A machine with an IMA of 5 and an AMA of 4 is used to raise a 10 kg load by 4. 0m . the work input to the machine is a. 40 J b. 0. 16 kJ c. 0. 39 kJ d. 0. 49 kJ Figure 8. 34 Multiple choice 17 45o 45o 1. 0 kg A 1. 0k g