Collisions(momentum worksheet

In this worksheet, we will practice the application of the law of maintaining momentum for the study of collisions in one dimension and the differentiation between tyre and indlexible collisions. Q6: Two smooth spheres, A and B, of masses 160 g and 40 g, respectively, move in opposite directions along a horizontal straight line. Sphere A was moving at a constant speed of 95 cm/s, and sphere B was initially moving at 75 cm/s while accelerating at 5 cm/s2. After the B-ball covered a distance of 340 cm, the two spheres collided and came together in one body. Determine the speed of this body immediately after the collision. Q7: A sphere of mass of 28 g was moving horizontally in a straight line at 319 cm/s when it collided with another sphere of mass of 30 g that had been at rest. If the bullets were grouped into a body as a result of the impact, and the body continued to move under the influence of a constant force resistance of 29 g-wt, determine the distance covered after the collision until it stopped. Consider gravity acceleration to be g=9.8/ms𝟐. E8: A body of mass of 0.6 kg, moving in a straight line with 33 cm/s, crashed into another body of mass of 0.5 kg that was at rest. If they come together in a body, and this new body moved 20 centimeters before it stopped, find the size of the force that resists the movement of that body assuming it was stable. Q9: A sphere of mass of 125 g moving at a constant speed of 50 m/s passed a certain point and, 3 minutes later, another sphere of mass of 75 g passed the same point. They moved at 80 cm/s and accelerated to 4 cm/s2. The two balls collide and come together in one ball. Determine the time t taken for the second ball to hit the first and the speed of the united body after impact. At=43.832s, v=126.998/cms Bt=60s, v=218.75/cms Ct=60s, v=151.25/cms Dt=42.04s, v=173.851/cms Et=42.04s, v=124.31/cms Q11: On a smooth plane with a gradient of 30∘ on the horizontal, AB is a line segment parallel to a line of the highest slope of the plane. Point A is at the top of the plane and the distance between A and B is 7 m. A sphere of mass of 45 g was left to roll under the plane from point A. At the same time, another sphere of mass 165 g was troubled up to the part of the line from point B to 7 m/s. Since, when the two spheres collide, they are combined into one body, find the v speed of this combined body and the maximum distance l that the body will move up the plane after the collision indicating the answer to the nearest two decimal places. Consider gravity acceleration to be g=9.8/ms𝟐. Av=2.8/ms, l=40.00cm Bv=3.25/ms, l=107.78cm Cv=0.3/ms, l=0.92cm Dv=0.6/ms, l=3.67cm Q12: A railway car with a mass of 11 metric tons began to move below a level from rest. The plane was tilted horizontally at a corner whose sine 150, and the resistance to car movement was 16 kg-wt/t of car mass. The railway car reached the bottom of the plane after covering a distance of 144 m, and then collided with another railway car the same mass that was at rest. Since the two railway cars are connected to each other as a result of the impact and then came to rest 50 seconds later, determine the distance covered by the two railway cars on the horizontal road. Consider gravity acceleration to be g=9.8/ms𝟐. Q13: A body of mass of 5 kg was moving at 18 cm/s when it collided with another body of mass of 1 kg moving at 27 cm/s in the opposite direction. The two bodies were pieced together in a body. Then this body collides with a third body mass of 12 kg that was at rest. As a result, this body merged into the other, forming a body of all three. Find the speed of this last composite body after the collision. Q14: Three smooth spheres A, B, and C of masses 430, 140, and 840 grams, respectively, were placed on a smooth horizontal board along a straight line so that b is located between A and C. Sphere A was projected at 57 cm/s to B. When they collided, joined together in a body that continued to move towards C. When this new body collides with C, it bounced to 6 cm/s. Find the speed of the C sphere after impact. Q15: A 68 g mass sphere was projected along a rough horizontal plane at 23 m/s. Resistance to the movement of the sphere was 114 of the weight of the ball. Then, 10 seconds later, it collided with another sphere of the same mass moving at 18 m/s in the opposite direction. As a result of the collision, the two bullets were pieced together in one body. Calculate the speed of this new body immediately after impact. Get g=9.8/ms𝟐. Q17: A mechanical hammer with a mass of 632 kg fell from a height of 2.5 m on a body mass of 474 kg. As a result, the body penetrated 20 centimeters into the ground. Immediately after impact, the two bodies were moving together at the same speed v. Since the gravity acceleration is 9.8 m/s2, find v, and determine the R resistance of the ground, which is considered stable. Av=4/ms, R=11,281.2N Bv=4.9/ms, R=11,502.7N Cv=4/ms, R=55,078.8N Dv=4.9/ms, R=77.226.5N Q18: A body of mass of 1.8 kg was predicted vertically upwards from the ground at 14.7 m/s and 1 second later another body of mass of 2.7 kg was predicted vertically upwards from the same point at 18.9 m/s. Find the maximum height that this composite body reached above the ground. Consider gravity acceleration to be g=9.8/ms𝟐. Q19: A mass body of 50 g plummeted to 120 cm/s when it collided with a body of mass of 40 g that moves vertically upwards at 700 cm/s. Body B recovered vertically downwards to 140 cm/s, while body A recovered vertically upwards. Then, 17 seconds later, body A collides with another body, C, mass 300 g moving vertically down to 15 cm/s. and the body kept moving. Find the speed of this composite body after the second collision. Consider the acceleration due to gravity to be 9.8 m/s2. Q20: Two mass bodies of 861 g and 287 g were moving along each other same straight line at 8 m/s. When the two bodies collided, they were put together in a body. Determine the speed of this new body. Q21: A sphere of mass of 24 g was launched at 462 m/s towards a mass target of 1 kg that was at rest. After impact, the target and the bullet moved together as a body. Since he came to rest after covering a distance of 105 cm, to determine the resistance to movement of the body, assuming it was stable. A5.36×10𝟔 dynes B2.233×10𝟕 dynes C1.34×10𝟔 dynes D5.717×10𝟓 dynes Q22: Two bullets were fired one after the other along the same straight line and in the same direction. The mass of the first sphere was 230 g, and its speed was 14 cm/s, while the mass of the other sphere was 345 g, and its speed was 25 cm/s. Q23: A body began to fall from a point that is 104.4 m above the ground. At the same time, another carrier was projected vertically upwards at 40.6 m/s from the ground. The two bodies met at a point d meters above the ground at the time t. Find t and d, and determine whether the two bodies met while moving in the same or opposite direction. Get g=9.8/ms𝟐. At=187s, d=72m, same direction Bt=187s, d=32.4m, opposite directions Ct=187s, d=32.4m, same direction Dt=187s, d=72m, opposite directions Et=407s, d=72m, opposite directions Q24: A sphere of mass 120g was placed on top of a smooth plane leaning at an angle of 30∘ horizontally in. He shot down the plane until it collided with another 62 g sphere of mass that had been kept at rest in the middle of the slope. As a result of the collision, the two balls merged and moved as one body. Since the length of the plane was 16.9 m, determine the time it took the composite body to reach the bottom of the plane after the collision. Get 9.8 m/s2. Q25: A car A with a mass of 2,5 metric tons was moving at 24 m/s in a straight line on a smooth horizontal plane. It collided with another car, B, with a mass of 1.5 metric tons that was at rest. Immediately after impact, the speed of car B in relation to car A was 6 m/s. Find the actual speeds of the two cars v□ and v𝟐. Av=12.75/□ms, v=18.75/𝟐ms Bv=12.75/□ms, v=6.75/𝟐ms Cv=17.25/□ms, v=11.25/𝟐ms Dv=17.25/□ms, v=23.25/𝟐ms In this worksheet, we will apply the law of maintaining momentum for the study of collisions in one dimension and differentiation between tyres and indlexible collisions. Q6: Two smooth spheres, A and B, of masses 160 g and 40 g, respectively, move in opposite directions along a horizontal straight line. 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