26/30

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رقم الشعبة: الرقم المتسلسل:

The University of Jordan
Faculty of Science
Physics Department

General Physics (1) (0302101)
Second Exam
First Semester 2016/2017

- Student's Name:..... ....Student's ID.. .....

Note 1: Following are 10 multiple-choice questions. Write the symbol of correct answer in the answers' table. ***Only*** the answers in the table will be graded.
Note 2: Ignore air resistance in all problems and take $|g| = 9.8\ m/s^2$ at the Earth's surface.
Note 3: The significant digit notation is not taken into account throughout the given answers.

Answers' Table

Question Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Symbol of Correct Answer	B	E	C	D	A	D	E	B	C	A	B	D	B	E	B

Q.1: A force $\vec{F} = (12\hat{i} - 10\hat{j})N$ acts on an object. The work (in J) that this force does as the object moves from the origin (0, 0, 0) to the point (13, 11, 0) m is:
[Hint: the displacement of the particle is: $\Delta\vec{r} = (13\hat{i} + 11\hat{j})m$]
a. 246 (b) 46 c. 37 d. 62 e. 100

Q.2: The work performed as a function of time for a process is given by $W = at^3$, where $a = 2.4\ J/s^3$. The instantaneous power output (measured in W) at $t = 3.7\ sec$ is:
a. 138 b. 69 c. 125 d. 207 (e) 99

Q.3: In the adjacent figure, two identical ideal massless springs have unstretched lengths of 0.25 m and spring constants of 700 N/m. The springs are attached to a small cube and stretched to a length L of 0.30 m as in Figure A. An external force P pulls the cube a distance $D = 0.020$ m to the right and holds it there. (See Figure B.) The external force P, that holds the cube in place in Figure B, is:
a. 14 N b. 25 N c. 28 N
d. 18 N e. 21 N

Figure A

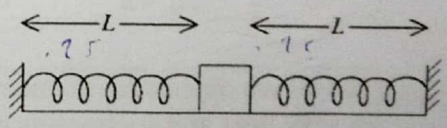
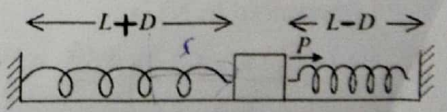


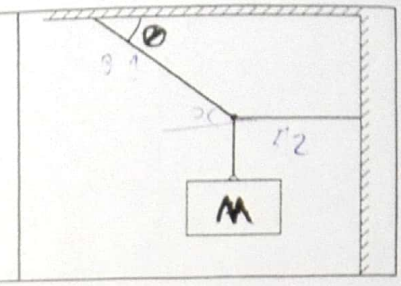
Figure B



Q.4: A force $F = bx3$ acts in the x direction, where the value of b is $3.7\ N/m^3$. The work (in J) done by this force in moving an object from $x = 0.00$ m to $x = 2.6$ m is:
a. 18.4 b. 67.3 c. 50.4 (d) 42.2 e. 9.8

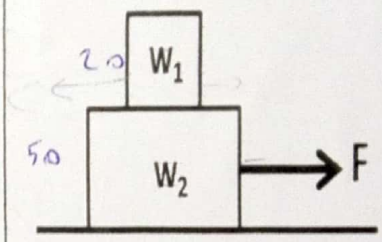
Q.5: In the adjacent figure, a block of mass M hangs at rest. The rope that is fastened to the wall is horizontal and has a tension off 52 N. The rope that is fastened to the ceiling has a tension of 91 N, and makes an angle θ with the ceiling. The angle θ (measured in degrees) is:

a. 55 ° b. 35° c. 30° d. 75° e. 45°



Q.6: Weight $W_1 = 20$ N rests on a second weight $W_2 = 50$ N on a perfectly smooth horizontal floor as shown in the adjacent figure. When a horizontal force F = 15 N is applied on the lower box (see figure), both boxes move together. The magnitude (in N) and direction of the net external force on the upper box is:

a. 4.28 N to the right b. 4.28 N to the left
c. 6.48 N to the right d. 6.48 N to the left
e. Zero

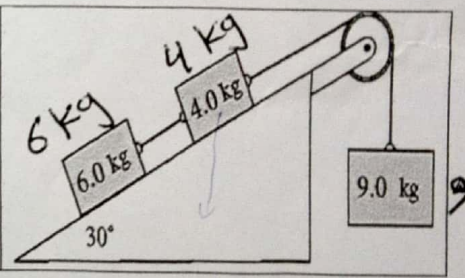


Q.7: A 5.00-kg box slides 4.00 m across a horizontal floor before coming to rest. If the box had an initial speed of 3.00 m/s, then, the coefficient of kinetic friction (μ_K) between the floor and the box is:

a. 0.412 b. 0.587 c. 0.321 d. 0.229 e. 0.115

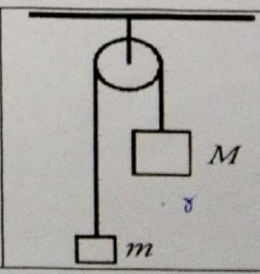
Q.8: A system comprising blocks, a light frictionless pulley, a frictionless incline, and connecting ropes is shown in the adjacent figure. The 9.0-kg block accelerates downward when the system is released from rest. The tension in the rope connecting the 6.0-kg block and the 4.0-kg block (measured in N) is:

a. 30 b. 42 c. 16 d. 99 e. 73



Q.9: Two objects are connected by a very light flexible string that passes over a very light and frictionless pulley as shown in the adjacent figure. Neglecting air resistance. If $M = 0.60$ kg and $m = 0.40$ kg, the tension in the string (measured in N) is:

a. 10 b. 1.1 c. 4.7 d. 9.3 e. 19



Q.10: True or False:
" The action and reaction forces are equal in magnitude, opposite in direction and act on different objects"

a. True b. False

Q.11: Two moons orbit a planet in nearly circular orbits. Moon *A* has orbital radius *r*, and moon *B* has orbital radius 4*r*. Moon *A* takes 20 days to complete one orbit. Neglecting gravitational interactions between the two moons, the time (measured in days) needed for moon B to complete an orbit is:

a. 20 b. 40 c. 80 d. 160 e. 320

Q.12: Planet X has a mass equal to 1/3 that of Earth, a radius equal to 1/3 that of Earth, and an axial spin rate 1/2 that of Earth. With *g* representing, as usual, the acceleration due to gravity on the surface of Earth, the acceleration due to gravity on the surface of planet X is:

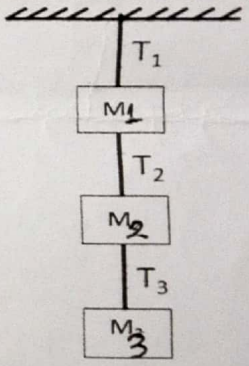
a. g/3 b. g/9 c. 6g d. 3g e. 9g

Q.13: A block is on a frictionless horizontal table, on earth. This block accelerates at 1.9 m/s^2 when a 90 N horizontal force is applied to it. The block and table are then set up on the moon where the acceleration due to gravity is 1.62 m/s^2. The weight (measured in N) of the block on the moon is:

a. 93.7 b. 76.7 c. 58.3 d. 48.2 e. 36.8

Q.14: The adjacent figure shows a setup of three masses that are connected by three wires. The whole system is under static equilibrium. If $m_1 = 10$ kg, $m_2 = 30$ kg and $m_3 = 30$ kg, The tension (T_1) in the first wire (measured in Newtons) is:

a. 980 b. 518 c. 294 d. 426 e. 686



Q. 15: True or False:
" Any accelerating frame of reference is considered as an inertial reference frame"

a. True b. False

Good Luck!!