

Instructor(s): *S. Obukhov*PHYSICS DEPARTMENT
Midterm Exam 1

PHY 2020

September 21, 2016

Name (print, last first): _____ Signature: _____

*On my honor, I have neither given nor received unauthorized aid on this examination.***YOUR TEST NUMBER IS THE 5-DIGIT NUMBER AT THE TOP OF EACH PAGE.**

- (1) **Code your test number on your answer sheet (use lines 76–80 on the answer sheet for the 5-digit number).** Code your name on your answer sheet. **DARKEN CIRCLES COMPLETELY.** Code your UFID number on your answer sheet.
- (2) Print your name on this sheet and sign it also.
- (3) Do all scratch work anywhere on this exam that you like. **Circle your answers on the test form.** At the end of the test, this exam printout is to be turned in. No credit will be given without both answer sheet and printout.
- (4) **Blacken the circle of your intended answer completely, using a #2 pencil or blue or black ink.** Do not make any stray marks or some answers may be counted as incorrect.
- (5) **The answers are rounded off. Choose the closest to exact. There is no penalty for guessing. If you believe that no listed answer is correct, leave the form blank.**
- (6) Hand in the answer sheet separately.

MULTIPLE CHOICE

Choose the one alternative that best completes the statement or answers the question.

1. Eratosthenes first learned about the position of the Sun in mid-summer by
 - (1) setting up sticks at both Syene and Alexandria.
 - (2) consulting library information.
 - (3) setting up a stick at Alexandria.
 - (4) setting up a stick at Syene.
 - (5) none of these
2. Which of the following is a scientific statement?
 - (1) Candy Bon Bons contain no sugar.
 - (2) There are parts of the universe that will never be discovered by humans.
 - (3) There are things we will never know about.
 - (4) Matter is filled with undetectable particles.
 - (5) none of these
3. Inertia is defined as a
 - (1) property of matter.
 - (2) force.
 - (3) change in motion.
 - (4) none of these
 - (5) —
4. Which concept is being illustrated when a tablecloth is quickly yanked beneath dishes resting on a table?
 - (1) inertia
 - (2) equilibrium
 - (3) support force
 - (4) friction
 - (5) —
5. A pair of 10-N vectors at right angles to each other has a resultant of about
 - (1) 14 N.
 - (2) 20 N.
 - (3) 10 N.
 - (4) none of these
 - (5) —
6. The minimum number of forces that act on a book resting on a table is
 - (1) 2
 - (2) 1
 - (3) 3
 - (4) 4
 - (5) none of these
7. One half second after starting from rest, a freely falling object will have a speed of about
 - (1) 5 m/s.
 - (2) 10 m/s.
 - (3) 2 m/s.
 - (4) 20 m/s.
 - (5) none of these

8. The muzzle velocity of a bullet fired from a new rifle is 100 m/s. Neglecting air resistance, at the end of one second a bullet fired straight up into the air will have traveled a distance of
- (1) $(100 - 5)$ m. (2) $(100 + 5)$ m. (3) 100 m. (4) 5 m. (5) none of these
9. A pot that falls from a ledge and hits the ground 45 m below hits the ground at
- (1) 30 m/s. (2) 60 m/s. (3) more than 120 m/s. (4) 120 m/s. (5) —
10. A rock weighs 30 N on Earth and another rock weighs 30 N on the Moon. Which rock has the greater mass?
- (1) the one on the Moon (2) the one on Earth (3) They have the same mass. (4) not enough information (5) —
11. A car by itself is capable of a certain maximum acceleration. When it tows a twice-as-massive car, its maximum acceleration is
- (1) one third. (2) the same. (3) one half. (4) one fourth. (5) none of these
12. A car has a mass of 1000 kg and accelerates at 2 m/s^2 . What net force is exerted on the car?
- (1) 2000 N (2) 1000 N (3) 500 N (4) 1500 N (5) none of these
13. Scotty Skydiver of mass 100 kg experiences air resistance of 500 N, and an acceleration of about
- (1) 0.5 g. (2) 0.2 g. (3) 0.3 g. (4) 0.4 g. (5) greater than 0.5 g.
14. When a cannonball is fired from a cannon, which undergoes the greater acceleration?
- (1) the cannonball (2) the recoiling cannon (3) both the same (4) — (5) —
15. You stand on your skateboard and exert a 50-N push on the wall next to you. If your mass is 60 kg, you'll momentarily accelerate from the wall at about
- (1) 0.8 m/s^2 . (2) 0.08 m/s^2 . (3) 8.0 m/s^2 . (4) none of these (5) —
16. The normal force that acts on a block of ice that slides on a ramp
- (1) decreases as the slope of the ramp increases.
(2) is equal to mg at all angles.
(3) becomes greatest when the ramp is vertical.
(4) —
(5) —
17. A motorcycle of mass 100 kilograms slowly rolls off the edge of a cliff and falls for three seconds before reaching the bottom of a gully. Its momentum upon hitting the ground is
- (1) 3,000 kg m/s. (2) 9,000 kg m/s. (3) 4,000 kg m/s. (4) 2,000 kg m/s. (5) 1,000 kg m/s.
18. The average braking force of a 1000-kg car moving at 10 m/s braking to a stop in 5 s is
- (1) 2000 N. (2) 1000 N. (3) 5000 N. (4) 3000 N. (5) 4000 N.