KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS

DEPARTMENT OF PHYSICS

PYP001-PREPARATORY PHYSICAL SCIENCE

TERM 051

FIRST MAJOR EXAM

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STUDENT ID
STUDENT NAME
SECTION NUMBER

1. A heavy object initially at rest is suspended by a vertical rope. When the object is **accelerated upward** by the rope, the **tension** in the rope **can be**
   A) Zero
   B) Equal to one tenth of the weight of the object
   C) Equal to twice the weight of the object
   D) Equal to the weight of the object
   E) Equal to half the weight of the object

2. If an object is dropped from a building and **falls freely**, then its
   A) Speed increases
   B) Weight increases
   C) Acceleration decreases
   D) Mass decreases
   E) Acceleration increases

3. An object is in **equilibrium** when it is
   A) Moving with a constant acceleration of 10 m/s/s
   B) Moving with decreasing speed
   C) Moving with constant velocity
   D) Moving in a circle with constant speed
   E) Moving with increasing speed

4. Five **seconds** after starting from **rest**, a **freely falling** object will have a speed of about
   A) 5 m/s
   B) 0 m/s
   C) 10 m/s
   D) 50 m/s
   E) 15 m/s

5. An object weighs 30 N on Earth. A second object weighs 30 N on the Moon. Which one has the **greater mass**?
   A) The one that has a smaller volume
   B) They have the same mass
   C) The one on the Moon
   D) The one that has a larger volume
   E) The one on Earth

6. The unit of **weight** is
   A) Newton/m
   B) m/s
   C) m/s^2
   D) Kilogram
   E) Newton

7. On the surface of Jupiter, where the acceleration due to gravity is about **three times** that of Earth, a 100-kg object would have a **mass** of about
   A) 600 kg
   B) 100 kg
   C) 300 kg
   D) 33.33 kg
   E) 3.33 kg

8. A man walks 10 km in 2 hours and then runs 5 km in half an hour. His **average speed** during the 15 km trip is
   A) 15 km/h
   B) 7.5 km/h
   C) 10 km/h
   D) 5 km/h
   E) 6 km/h

9. A ball is thrown straight up from the ground with an initial speed of **30 m/s**. How long does it **stay** in the air?
   A) 10 s
   B) 4 s
   C) 6 s
   D) 2 s
   E) 8 s

10. When a parachutist of mass 100 kg experiences air resistance of 500 N, he has an **acceleration** of about
    A) 4 m/s/s
    B) 5 m/s/s
    C) 20 m/s/s
    D) 3 m/s/s
    E) 10 m/s/s

11. An object following a **straight-line path at constant speed**
    A) Has a net force acting upon it that is normal to the direction of motion
    B) Has a constant acceleration that is different from zero
    C) Has zero inertia
    D) Has a net force acting upon it in the direction of motion
    E) Has zero acceleration

12. A force is a **vector** quantity because
    A) It has both magnitude and acceleration
    B) It has both magnitude and direction
    C) It has magnitude but no direction
    D) It has both mass and acceleration
    E) It has both magnitude and inertia

13. While a car travels around a **circular track** at **constant speed**
    A) It has no net force acting upon it
    B) It is in equilibrium
    C) Its acceleration is zero
    D) It is accelerating
    E) Its velocity is constant

14. If an object has **twice** as much **mass** as another object, then it **must have twice** as much
    A) Gravitational acceleration
    B) Velocity
    C) Inertia
    D) Speed
    E) Volume

15. A **1-kg mass** on the earth's surface **weighs** about
    A) 1 N
    B) 10 N
    C) 12 N
    D) 98 N
    E) 5 N

16. When two forces are exerted on a 100-kg object, 600 N to the right and 400 N to the left, the object moves with an **acceleration** of
    A) 4 m/s/s to the right
    B) 10 m/s/s to the right
    C) 4 m/s/s to the left
    D) 2 m/s/s to the right
    E) 2 m/s/s to the left

17. An object is thrown vertically up into the air. At its **highest** point the **net force** on it is
    A) More than its weight
    B) Less than its weight
    C) Zero
    D) Equal to air resistance
    E) Its weight

18. The force of friction on a 1-kg sliding object is 10 N. The applied force needed to maintain a **constant velocity** is
    A) Slightly more than 10 N
    B) Slightly less than 10 N
    C) Much more than 10 N
    D) Much less than 10 N
    E) 10 N

19. **Neglecting air resistance**, objects fall
    A) At constant velocity
    B) At constant speed
    C) With increasing acceleration
    D) At constant acceleration
    E) Constant distances each second

20. When an object thrown straight upwards gets to its **highest** point,
    A) Its speed is about 10 m/s and its acceleration is zero
    B) Its speed is about 10 m/s and its acceleration is about 10 m/s/s downward
    C) Its speed is zero and its acceleration is unknown
    D) Its speed is zero and its acceleration is about 10 m/s/s downward
    E) Its speed is zero and its acceleration is zero

Answer Key

1. C
2. A
3. C
4. D
5. C
6. E
7. B
8. E
9. C
10. B
11. E
12. B
13. D
14. C
15. B
16. D
17. E
18. E
19. D
20. D