ASM TUITION ACADEMY

PHYSICS

YEAR 8

TOPIC: HOW DOES GRAVITY CHANGE IN DIFFERENT PARTS OF SPACE?

TEST QUESTIONS

TOTAL MARKS: 55

TIME: 45 MINUTES

Section A: Multiple-Choice Questions

Q1. What is the space around the Earth where objects experience its gravitational force called? [1]

A. Magnetic field
B. Gravitational field
C. Electric field
D. Contact field

Q2. What causes an apple to fall from a tree when its stem breaks? [1]

A. Friction
B. Magnetism
C. Gravity
D. Air pressure

Q3. What is the force of gravity on an object also known as? [1]

A. Mass
B. Weight
C. Speed
D. Density

Q4. Which equation is used to calculate weight? [1]

A. $W = m \div g$
B. $W = m + g$
C. $W = mg$
D. $W = g \div m$

Q5. What is the approximate gravitational field strength at the Earth's surface? [1]

A. 1 N/kg
B. 5 N/kg

C. 10 N/kg
D. 20 N/kg

Q6. What is the weight of a 1 kg mass at the Earth's surface? [1]

A. 1 N
B. 5 N
C. 10 N
D. 100 N

Q7. What is the approximate gravitational field strength at the height of the satellite's orbit? [1]

A. 2 N/kg
B. 7 N/kg
C. 10 N/kg
D. 15 N/kg

Q8. What happens to the Earth's gravitational field strength as distance from Earth increases? [1]

A. It increases
B. It decreases
C. It stays the same
D. It becomes zero immediately

Q9. After escaping Earth's gravitational field, which object's gravitational field still affects a spacecraft travelling through the Solar System? [1]

A. The Moon only
B. The Sun
C. An apple
D. The Earth's ground

Q10. How can a spacecraft use the gravity of outer planets? [1]

A. To increase its mass
B. To stop all gravitational forces
C. To help it continue on its journey
D. To produce oxygen

Section B: Fill in the Blanks

Q11. The force of gravity on an object is also known as its _____. [1]

Q12. The symbol used for gravitational field strength is _____. [1]

Q13. Weight is calculated using the equation W = _____. [1]

Q14. Gravitational field strength is measured in _____. [1]

Q15. The approximate gravitational field strength at the Earth's surface is _____ N/kg. [1]

Q16. A mass of 1 kg experiences a gravitational force of approximately _____ N at Earth's surface. [1]

Q17. At the height of the satellite's orbit, the value of g is approximately _____ N/kg. [1]

Q18. The ground exerts an upward _____ force on an apple resting on it. [1]

Q19. As an object moves farther from Earth, Earth's gravitational field strength _____. [1]

Q20. The spacecraft experiences an attractive gravitational force exerted by the _____ after escaping Earth's gravitational field. [1]

Section C: Short-Answer Questions

Q21. Define the Earth's gravitational field and explain what causes an apple to fall when its stem breaks. [3]

Q22. Explain why an apple resting on the ground does not continue to fall, even though Earth still exerts gravity on it. [4]

Q23. Define gravitational field strength. State its symbol and unit. [4]

Q24. A satellite has a mass of 1200 kg. Calculate its weight at the Earth's surface, where g = 10 N/kg. Show your working. [4]

Q25. The same satellite orbits Earth where g = 7 N/kg. Calculate its weight in orbit. Show your working. [4]

Q26. Compare the gravitational field strength at Earth's surface with that at the height of the satellite's orbit. Explain what this tells us about gravity and distance. [4]

Q27. Explain why a spacecraft travelling towards the edge of the Solar System still experiences gravity after escaping Earth's gravitational field. [4]

Q28. Describe how the gravity of the outer planets can help a spacecraft continue its journey when it runs out of fuel. [4]

Q29. A satellite has a mass of 500 kg. Calculate its weight:

a) At Earth's surface, where g = 10 N/kg. [2]

b) At a location where g = 7 N/kg. [2]