

ORDNANCE FACTORY HIGHER SECONDARY SCHOOL, CHANDA

STD X

GRAVITATION

Max. Marks: 40

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Q I (A) 1.Fill in the blanks and rewrite the completed statements [2]

- i) Escape velocity on the Earth -----km/s.
- ii) The distance traveled by the planet in one revolution =-----

2. Match the pairs [2]

- | | |
|--------------------------------|---------------------------|
| a) Acceleration due to gravity | x) Same in the universe |
| | y) Zero at the centre. |
| b) Gravitational constant | z) Measurement of inertia |

3. State True/False of the following. [1]

The SI unit of G (universal constant) is Nm^2/kg^2

B. Rewrite the following statements by selecting the correct options.

- 1 The value of G ---- a) 6.67×10^{-11} b. 6.67×10^{11} c. 6.76×10^{11}
- 2. The mass of the earth ---- a) $6 \times 10^{24} kg$ b) $6 \times 24^{10} kg$ c) $6.4 \times 10^6 kg$
- 3. The Radius of the Earth ----- a) $6 \times 10^{24} kg$ b) $6 \times 24^{10} kg$ c) $6.4 \times 10^6 kg$
- 4. If your mass in the school is 35 kg. then the weight will be ----a)343N, b)434N,c)3.43N
- 5. Keplers second law is also known as -----a)law of orbit b) Law of period, c) Law of Area.

Q II) Answer the following (any 5) [10]

- 1 State the Newton's law of Gravitation. Give the mathematical relation of law.
- 2 State the factor affecting Earth's gravitational acceleration.
- 3 What is centripetal Force ? 10m on a planet. What is the value of g on that planet?
- 4 What are free fall of a body ? Which force affects the free fall of a body?

- 5. Write a note on weightlessness in space.
- 6. Give Reason – Acceleration due to gravity is maximum at the pole.

Q. III. Attempt the following any FIVE [15]

- 1. Write the three laws given by Kepler,
- 2.If a spacecraft goes out of the orbit ,then what will happened to it explain in details.
- 3 State the difference between Mass &Weight
- 4The period of revolution of a planet at a distance R from a Star be T then Prove that if it was at a distance of 2R from the star, its period of revolution will be $\sqrt{8} T$.
- 5The radius of planet A is half the radius of planet B. If the mass of A is M_A , What must the mass of B so that the value of g on B is half of its value on A?
- 6. Determine the value of g on the Earth's surface.(By using **Newton's law of Gravitation**)

Q. IV Attempt the following in details any ONE [5]

State the units for the following

- a) Mass
- b) Weight
- c) Acceleration due to gravity
- d) Gravitational constant.
- e) Force

[The purpose of Q/P is to nurture individuality and enhance ones innate potential.]

**** @ happy learning**