Suguna International School

Cyclic Test – 3

Class & Sec: XI B **Subject: Physics**

Date: 13.11.2025 **Marks: 25**

	SECTION – A	
1	At what height (h) above the earth's surface would the acceleration due to gravity be one-fourth of its value at the earth's surface? (A) h = R (B) h = 4R (C) h = 2R (D) h = 16R	1
2	If R is the radius of a planet, g is acceleration due to gravity and M is the mass, then the density of the planet is given by (A) $\rho = 3gG/4\pi R$ (B) $\rho = 4\pi gR/3G$ (C) $\rho = 4\pi GR/3g$ (D) $\rho = 3g/4\pi GR$	1
3	The escape velocity of a projectile, from the earth is approximately (A) 7 km/s (B) 11.2 km/s (C) 112 km/sec (D) 1.1 km/s	1
4	According to Kepler's laws, which of the following is correct (A) $T \propto R^{3/2}$ (B) $T \propto R^3$ (C) $T \propto R^{2/3}$ (D) $T \propto R^2$	1
5	If longitudinal strain for a wire is 0.03 and its Poisson ration is 0.5, then its lateral strain is (A) 0.003 (B) 0.0075 (C) 0.015 (D) 0.4	1
6	The dimensional formula of modulus of rigidity (shear modulus) is (A) $[ML^{-2}T^{-2}]$ (B) $[ML^{-3}T^{-2}]$ (C) $[ML^2T^{-2}]$ (D) $[ML^{-1}T^{-2}]$	1
7	Energy stored in stretching a string per unit volume is (A) (stress) x (strain) (B) ½ (stress) x (strain) (C) Y $(Strain)^2$ (D) ½ Y $(Stress)^2$	1
	SECTION – B	
8	Write the formula for the following: i. Accleration due to gravity at a height 'h' from the surface of the earth. ii. Orbital velocity of a satellite	2
9	i. State Hooke's law ii. Define strain and write its unit	2

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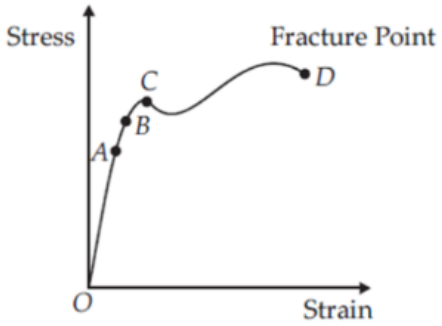
	SECTION – C	
10	i. At what height from the surface of earth does the acceleration due to gravity become 4% of its value on the surface of earth? (Re = 6400 km) ii. Derive the expression for escape velocity and orbital velocity and find the ratio V_e/V_o	5
11	With neat diagrams, define and derive the following: i. Young's Modulus (Y) ii. Bulk Modulus (K) iii. Shear Modulus (η)	5
	SECTION – D (Case Study Based Question)	
12	 i. If deforming forces are removed up to which point the curve will be retraced? (A) upto *OA* only (B) upto *OB* (C) upto *C* (D) Never retraced its path ii. The breaking stress for a wire of unit cross-section is called (A) yield point (B) elastic fatigue (C) tensile strength (D) Young's modulus iii. During unloading beyond *B*, say *C*, the length of the wire at zero stress in now equal to (A) less than original length (B) greater than original length (C) original length (D) can't be predicted iv. Substances which can be stretched to cause large strains are called (A) Isomers (B) Plastomers (C) Elastomers (D) Polymers	4

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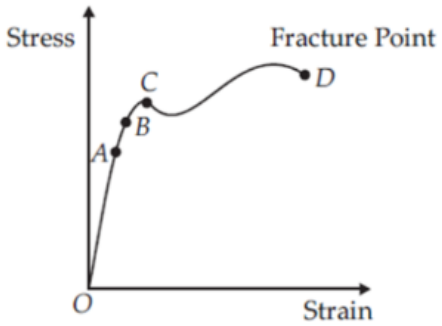
12	 i. If deforming forces are removed up to which point the curve will be retraced? (A) upto *OA* only (B) upto *OB* (C) upto *C* (D) Never retraced its path ii. The breaking stress for a wire of unit cross-section is called (A) yield point (B) elastic fatigue (C) tensile strength (D) Young's modulus iii. During unloading beyond *B*, say *C*, the length of the wire at zero stress in now equal to (A) less than original length (B) greater than original length (C) original length (D) can't be predicted iv. Substances which can be stretched to cause large strains are called (A) Isomers (B) Plastomers (C) Elastomers (D) Polymers	4