Physics NTA Abhyas 55-58 22.07.2020

01. A body starts from rest with uniform acceleration. If its velocity after n seconds is v, then its displacement in the last two seconds is : **[NTA Abhyas-55-17]**

(1) $\frac{2v(n+1)}{n}$ (2) $\frac{v(n+1)}{n}$

(3) $\frac{v(n-1)}{n}$ **(4)** $\frac{2v(n-1)}{n}$

02. Choose the wrong statement. **[NTA Abhyas-56-17]**
(1) Zero–velocity of a particle at any instant does not necessarily mean that its acceleration is zero
(2) Zero–acceleration of a particle at any instant does not necessarily mean that its velocity is zero
(3) If the speed of a particle is constant, its acceleration must be zero
(4) none of the above

03. When a particle moves in a circle with a uniform speed **[NTA Abhyas-56-18]**
(1) its velocity and acceleration are both constants
(2) its velocity and constant but the acceleration changes
(3) its acceleration is constant but the velocity changes
(4) its velocity and acceleration both change

04. A car of mass 1000 kg moves on a circular path with a constant speed of $16ms^{-1}$. It is turned by 90° after travelling 628 m on the road. The centripetal force acting on the car is **[NTA Abhyas-57-18]**
(1) 160 N (2) 320 N
(3) 640 N (4) 1280 N

05. A block A kept on an inclined surface just begins to slide if the inclination is 30°. The block is replaced by another block B and it is found that it just begins to slide if the inclination is 40°. **[NTA Abhyas-56-19]**
(1) mass of A > mass of B (2) mass of A < mass of B
(3) mass of A = mass of B **(4) all the three are possible**

06. A particle is moving on rough horizontal ground with an initial velocity v_0. If $\frac{3^{th}}{4}$ of its kinetic energy is lost due to friction in time t_0, then the coefficient of friction between the particle and the ground is **[NTA Abhyas-57-19]**

(1) $\frac{v_0}{2gt_0}$ (2) $\frac{v_0}{4gt_0}$

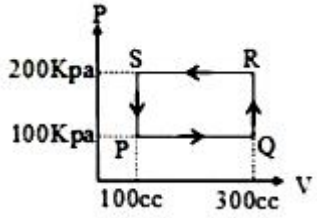
(3) $\frac{3v_0}{4gt_0}$ (4) $\frac{v_0}{gt_0}$

07. Which of the following statements is true for collisions? **[NTA Abhyas-55-21]**
(1) momentum is conserved in elastic collisions but not in inelastic collisions.
(2) total kinetic energy is conserved in elastic collisions but momentum is not conserved.
(3) total kinetic energy is not conserved in inelastic collisions but momentum is conserved
(4) total kinetic energy and momentum both are conserved in all types of collisions

08. If Wien's constant b=0.3 cm K, then the temperature of the Sun having a maximum intensity of radiation at 5000Å wavelength is **[NTA Abhyas-55-10]**
(1) 5000 K **(2) 6000 K**
(3) 4000 K (4) 7000 K

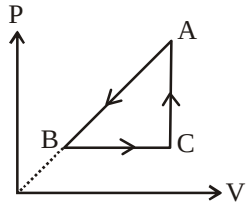
09. R.M.S. velocity of oxygen molecules at N.T.P. is $0.5 km\ s^{-1}$. The R.M.S. velocity for the hydrogen molecule at N.T.P. is **[NTA Abhyas-59-20]**
(1) $4 km\ s^{-1}$ **(2) $2 km\ s^{-1}$**
(3) $3 km\ s^{-1}$ (4) $1 km\ s^{-1}$

10. A thermodynamic system is taken through the cycle PQRSP process. The net work done by the system is **[NTA Abhyas-55-11]**



(1) 20 J **(2) –20 J**
(3) 400 J (4) –374 J

11. P–V diagram of cyclic process ABCA is as shown in figure. Choose the correct statement **[NTA Abhyas-55-13]**



(1) $\Delta Q_{A\to B}$ is negative (2) $\Delta U_{B\to C}$ is positive
(3) ΔW_{CAB} is negative **(4) all of these**

12. A Photocell is illuminated by a small bright source placed 1m away. When the same source of light is placed ½ m away, the number of electrons emitted by photocathode would **[NTA Abhyas-56-37]**
(1) increase by a factor of 2 (2) decrease by a factor of 2
(3) increase by a factor of 4(4) decrease by a factor of 4

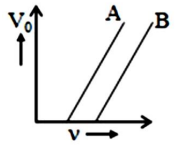
13. An electron in the H atom makes a transition from n=3 to n=1. The recoil momentum of the H atom will be **[NTA Abhyas-55-34]**

(1) 6.45×10^{-27} N s (2) 6.8×10^{-27} N s
(3) 6.45×10^{-24} N s (4) 6.8×10^{-24} N s

14. A radioactive sample at any instant has its disintegration rate 5000 dpm. After 5 minutes, the rate is 1250 dpm. Then, the decay constant (per minute) is **[NTA Abhyas-55-36]**
(1) 0.8 ln2 **(2) 0.4 ln2**
(3) 0.2 ln2 (4) 0.1 ln2

15. A transistor is used as an amplifier in common base mode with a load resistance of 5kΩ. The current gain of the amplifier is 0.98 and the input resistance is 70Ω. The voltage gain and power gain respectively are : **[NTA Abhyas-55-41]**
(1) 70, 68.6 (2) 80, 75.6
(3) 60, 66.6 (4) 90, 96.6

16. The stopping potential as a function of frequency of incident radiation is plotted for two different photoelectric surfaces A and B. The graphs show that the work function of A is **[NTA Abhyas-57-37]**



(1) greater than that of B **(2) smaller than that of B**
(3) same as that of B
(4) such that no comparison can be done from given graphs

17. A metal rod of Young's modulus Y and coefficient of linear expansion α is held at its two ends such that its length remains constant on changing the temperature. If its temperature is raised by t °C, the thermal stress developed in it is **[NTA Abhyas-58-34]**

(1) $\frac{\alpha t}{Y}$ (2) $\frac{Y}{\alpha E}$

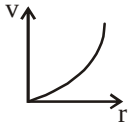
(3) Yαt (4) $\frac{1}{Y\alpha t}$

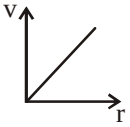
18. A mosquito with 8 legs stands on water surface and each leg makes depression of readius a. If the surface tension and angle of contact are T and zero respectively, then the weight of mosquito is **[NTA Abhyas-56-30]**
(1) 8Ta **(2) 16πTa**

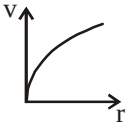
(3) $\frac{Ta}{8}$ (4) $\frac{Ta}{16\pi}$

19. The level of water in a tank is 5 m high. A hole of the area 10 cm^2 is made in the bottom of the tank. The rate of leakage of water from the hole is **[NTA Abhyas-58-17]**
(1) 10^{-2} $m^3 s^{-1}$ (2) 10^2 $m^3 s^{-1}$
(3) 10 $m^3 s^{-1}$ (4) 10^{-4} $m^3 s^{-1}$

20. Terminal velocity (v) of a of spherical object varies with a radius of object (r) as – **[NTA Abhyas-58-42]**

(1) 

(2) 

(3) 

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