# ST. LAWRENCE HIGH SCHOOL

## 27, BALLYGUNGE CIRCULAR ROAD

| Class : 11 | Subject : PHYSICS | Term : 2nd Term | Max Marks : 80 |
|---|---|---|---|

**Q 1 :**  1. If energy($E$), velocity ($v$) and force ($F$) are taken as fundamental quantities, then the dimension of mass is

     i. $FV^{-2}$      ii. $Fv^{-1}$      iii. $Ev^{-2}$      iv. $Ev^2$

**Marks :** 1

1 . i

2 . ii

**3 .** iii      ✅ ( This Answer is Correct )

4 . iv

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**Q 2 :**  3. When a ball is thrown vertically up with velocity $v_0$, it reaches a maximum height of $h$. If one wishes to triple the maximum height then the ball should be thrown with velocity

     i. $v_0\sqrt{3}$      ii. $3v_0$      iii. $9v_0$      iv. $3v_0/2$

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 3 :**  5. If y =$(x^4/4)\cos x$, then dy/dx is

     i. $x^3\cos x - (x^4/4)\sin x$    ii. $x^3\sin x - (x^4/4)\cos x$    iii. $(x^3/4)\cos x$ -sinx    iv. None of this

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 4 :**  7. A body starts moving with a velocity $v_0$ equal to 10m/s. It experiences a retardation equal to 4m/s². Its velocity after 2s is given by

     i. 2m/s      ii. 4m/s      iii.(-2)m/s      iv. 6m/s

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 5 :**  11. Two vectors of equal magnitude have a resultant equal to either of them, then the angle between them is

     i. 30°      ii. 120°      iii. 60°      iv. 45°

**Marks :** 1

1 . i

**2 .** ii      ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 6 :** 12. The resultant two forces, one double the other in magnitude, is perpendicular to the smaller of the two forces. The angle between the two forces is

        i. 0°        ii. 60°        iii.90°        iv. 120°

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 .** iv      ☑ ( This Answer is Correct )

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**Q 7 :** 16. For two non zero vectors $P$ and $Q$ of unequal magnitudes, $|P+Q| = |P-Q|$. What is the angle between two vectors?

        i.0°        ii.30°        iii.45°        iv.90°

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 .** iv      ☑ ( This Answer is Correct )

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**Q 8 :** 19. The angle between $i + j$ and $i - k$ is

        i.60°        ii. 30°        iii.45°        iv.90°

**Marks :** 1

**1 .** i      ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 9 :** 20. When a man projects himself at an angle 30° with the perpendicular direction of the bank of a river, he can reach the exactly opposite point on the other bank. If his speed in still water is 12km/h, then what is the speed of the river?

        i. 12km/h        ii.12√3km/h        iii.6√3km/h        iv.6km/h

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 .** iv      ☑ ( This Answer is Correct )

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**Q 10 :** 21. If $A = 2i + 3j$ and $B = i + j$, then what is the component of $A$ along the direction of $B$?

        i. 1/√2        ii. 3/√2        iii. 5/√2        iv. 7/√2

**Marks :** 1

1 . i

2 . ii

**3 .** iii      ☑ ( This Answer is Correct )

4 . iv

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**Q 11 :**      22. For what values of $a$ and $b$, $a\,i + b\,j$ is perependicular to $i + j$ ?          **Marks :**    1

              i. 1, 0              ii. (-2), 0          iii. 3, 0       iv. 1/√2, -1/√2

1 .  i

2 .  ii

3 .  iii

**4 .**  iv                                                ☑ ( This Answer is Correct )

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**Q 12 :**      23. Two bodies are projected from the same point with same initial speed at angles (45°-θ) and (45°+θ)    **Marks :**    1
              respectively. The ratio of their ranges is

              i. 2:1           ii. 1:1          iii. 2:3        iv.1:2

1 .  i

**2 .**  ii                                                ☑ ( This Answer is Correct )

3 .  iii

4 .  iv

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**Q 13 :**      25. A water jet, whose cross sectional area is $\theta a$ strikes a wall making an angle $q$ with the normal and    **Marks :**    1
              rebounds elastically. The velocity of water of density $d$ is $v$. The force exerted on the wall is

              i. $2av^2dcos\theta$        ii.$2av^2dsin\theta$     iii.$2avdcos\theta$     iv. $avdcos\theta$

**1 .**  i                                                ☑ ( This Answer is Correct )

2 .  ii

3 .  iii

4 .  iv

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**Q 14 :**      26. A player catches a 200g ball moving with a speed of 20m/s. If the time taken to complete the catch is    **Marks :**    1
              0.5 sec, the force exerted on the player's hand is

              i. 8N            ii. 4N           iii. 2N        iv. 0

**1 .**  i                                                ☑ ( This Answer is Correct )

2 .  ii

3 .  iii

4 .  iv

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**Q 15 :**      28. A person of mass 60kg is standing on the floor of a moving lift that is going up with an acceleration    **Marks :**    1
              6m/s². What is the ratio of the floor reaction in N to his mass in Kg? ($g$=10m/s²)

              i. 16:1           ii. 10:1          iii.1:1         iv.1:16

**1 .**  i                                                ☑ ( This Answer is Correct )

2 .  ii

3 .  iii

4 .  iv

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**Q 16 :**      34. A block has been placed on an inclined plane with the slope angle $\theta$, the block slides down the plane    **Marks :**    1
              at constant speed. The coefficient of kinetic friction is equal to

              i.$sin\theta$         ii.$cos\theta$          iii.$tan\theta$          iv. $g$

1 .  i

2 . ii

**3 .** iii ✅ ( This Answer is Correct )

4 . iv

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**Q 17 :**  36. A ceiling fan is switched off while rotating with a speed of 100rpm. It stops after 15secs. How many turns has it completed within that 15sec? **Marks :** 1

     i.12.5      ii.40      iii.32.6      iv.15.6

**1 .** i ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 18 :**  37. The linear and angular accelerations of a particle are 10m/s² and 5rad/s² respectively. Its distance from the axis of rotation is **Marks :** 1

     i. 50m      ii. 0.5m      iii.1m      iv.2m

1 . i

2 . ii

3 . iii

**4 .** iv ✅ ( This Answer is Correct )

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**Q 19 :**  38. A string of length 0.1m cannot bear a tension more than 100N. It is tied to a body of mass 100g and rotated in a horizontal circle. The maximum angular velocity can be **Marks :** 1

     i. 100rad/s      ii. 1000rad/s      iii. 10000rad/s      iv. 0.1rad/s

**1 .** i ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 20 :**  39. A ball of mass 12kg and another of 6kg are dropped from a 60feet tall building. After a fall of 30 feet each, towards earth, their kinetic energies will be in the ratio **Marks :** 1

     i. √2:1      ii.1:4      iii.2:1      iv. 1:√2

1 . i

2 . ii

**3 .** iii ✅ ( This Answer is Correct )

4 . iv

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**Q 21 :**  43. A weightless thread can withstand tension upto 30 N. A stone of mass 5kg is tied to it and is revolved in a circular path of radius 2m in a vertical plane. If $g$ = 10m/s², then the maximum angular velocity of the stone can be **Marks :** 1

     i.5rad/s      ii. √30rad/s      iii. √60rad/s      iv. 10rad/s

**1 .** i ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 22 :** 47. Bullets of mass 40g each are fired from a machine gun with velocity 1000m/s. If the person firing, experiences average force of 200N, then the number of bullets fired per minute is

i. 300      ii. 600      iii. 150      iv.75

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 23 :** 50. A ring and a disc have the same mass and radius. The ratio of their moments of inertia about the axes passing through their centre of mass is

i. 1:1      ii. 2:1      iii. 4:1      iv.1:2

**Marks :** 1

1 . i

**2 .** ii      ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 24 :** 52. If the mass of the earth is 80 times that of a planet and diameter double that of the planet and $g$ on the earth is 9.8m/s², then the value of $g$ of the planet is

i. 4.9m/s²      ii.0.98m/s²      iii.49m/s²      iv. 0.49m/s²

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 .** iv      ✅ ( This Answer is Correct )

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**Q 25 :** 54. The orbital velocity for an earth satellite near the surface of earth is 7km/s. If the radius of the orbit is 4 times the radius of earth, its orbital velocity would be

i. 7km/s      ii. 3.5km/s      iii. 7√2km/s      iv. 14km/s

**Marks :** 1

1 . i

**2 .** ii      ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 26 :** 56. The period of revolution of Planet A around sun is 8 times that of Planet B. The distance of A is how many times greater than that of B from sun?

i. 2      ii. 3      iii. 4      iv. 5

**Marks :** 1

1 . i

2 . ii

**3 .** iii      ✅ ( This Answer is Correct )

4 . iv

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**Q 27 :** 1

57. The increase in length of a wire in stretching is 0.025%. If its Poisson's ratio is 0.4, then the percentage decrease in diameter is

**Marks :**

i. 0.01      ii. 0.02      iii. 0.03      iv. 0.04

**1 .** i                ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 28 :**     59. If longitudinal stress $X$ is produced in a wire of Young's modulus $Y$, then the potential energy stored in its unit volume is

**Marks :** 1

i. $YX^2$      ii. $2YX^2$      iii. $0.5XY^2$      iv. $0.5YX^2$

1 . i

2 . ii

3 . iii

**4 .** iv                ✅ ( This Answer is Correct )

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**Q 29 :**     60. In a hydraulic press, the small and large cylinders have diameters of $d_1$ and $d_2$ respectively. If a force $F_1$ is applied on the small piston, then the force $F_2$ on the large piston is given by

**Marks :** 1

i. $F_1.d_2^2/d_1^2$      ii. $F_1.d_1^2/d_2^2$      iii. $(1/F_1)x\ (d_1^2/d_2^2)$      iv. $(1/F_1)x\ (d_2^2/d_1^2)$

**1 .** i                ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 30 :**     63. Surface tension of water is $0.072N.m^{-1}$. The excess pressure inside a water drop of diameter 1.2mm is

**Marks :** 1

i. $240N/m^2$      ii. $120N/m^2$      iii. $0.06N/m^2$      iv. $72N/m^2$

**1 .** i                ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 31 :**     64. There is a dip in the capillary tube, when the angle of contact

**Marks :** 1

i. $90°$      ii. $0°$      iii. greater than $90°$      iv. less than $90°$ but more than $0°$

1 . i

2 . ii

3 . iii

**4 .** iv                ✅ ( This Answer is Correct )

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**Q 32 :**     66. The rate of volume flow of liquid of viscosity $\eta$ through a capillary tube attached near to the bottom of a tank is proportional to

**Marks :** 1

i. $\eta$      ii. $(1/\eta)$      iii. $\eta^2$      iv. $(1/\eta^2)$

1 . i

**2 .** ii                ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 33 :**   67. Two rain drops falling through air have radii in the ratio of 1:2. The ratio of their terminal velocity is                                                   **Marks :** 1

   i. 4:1                    ii. 1:4                    iii. 2:1                    iv. 1:2

1 . i

**2 . ii**                                                         ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 34 :**   68. A bimetallic strip is made of two strips A and B having coefficients of linear expansions $\alpha_A$ and $\alpha_B$                                          **Marks :** 1
   respectively, If $\alpha_A < \alpha_B$, then heating would cause the bimetallic strip

   i. to bend with A away from the radius of curvature          ii. to bend with B away from the radius of curvature
   iii. to linearly expand without bending                      iv. none of Options 1 to 3

1 . i

**2 . ii**                                                         ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 35 :**   71. When a gas enclosed in a closed vessel was heated so as to increase its temperature by 5°C, its                                               **Marks :** 1
   pressure was seen to increase by 1%. The initial temperature of the gas was nearly

   i. 500°C                    ii. 273°C                    iii. 227°C                    iv. 150°C

1 . i

2 . ii

**3 . iii**                                                        ☑ ( This Answer is Correct )

4 . iv

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**Q 36 :**   77. Two rods of lengths $d_1$ and $d_2$ and thermal conductivity $k_1$ and $k_2$ are kept touching each other end to                               **Marks :** 1
   end. Both have the same cross-sectional area. The equivalent thermal conductivity is

   i. $k_1+k_2$                  ii. $k_1d_1+k_2d_2$              iii. $(k_1d_2+k_2d_1)/(d_1+d_2)$            iv. $(d_1+d_2)/(d_1/k_1+ d_2/k_2)$

1 . i

2 . ii

3 . iii

**4 . iv**                                                         ☑ ( This Answer is Correct )

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**Q 37 :**   78. The energy emitted per second by a black body at 27°C is 10J. If the temperature of the black body is                                        **Marks :** 1
   in increased to 327°C, the energy emitted per second increases to

   i. 20J                    ii. 40J                    iii. 80J                    iv. 160J

1 . i

2 . ii

3 . iii

**4 . iv**                                                         ☑ ( This Answer is Correct )

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**Q 38 :** 79. According to Newton's law of cooling, the rate of cooling of a body is proportional to $(\Delta\theta)^n$, where $\Delta\theta$ is the difference of temperature between the body and the surrounding and $n$ is equal to

     i. 1          ii. 2          iii. 3          iv.4

**Marks :** 1

**1 .** i          ✅ ( This Answer is Correct )

**2 .** ii

**3 .** iii

**4 .** iv

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**Q 39 :** 80. A black body has maximum wavelength $\lambda_m$ at 2000K. Its corresponding wavelength at 3000K is

     i. $3\lambda_m/2$          ii. $2\lambda_m/3$          iii. $16\lambda_m/81$          iv. $81\lambda_m/16$

**Marks :** 1

**1 .** i

**2 .** ii          ✅ ( This Answer is Correct )

**3 .** iii

**4 .** iv

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**Q 40 :** 6.The displacement of a particle in 1D motion is given as $x = 50 + 2t - 3t^3$ in m, where $t$ is in sec. The motion of the particle is

     i. uniformly accelerated          ii. uniformly decelerated

     iii. non-uniformly accelerated          iv. non-uniformly decelerated

**Marks :** 1

**1 .** i

**2 .** ii

**3 .** iii

**4 .** iv          ✅ ( This Answer is Correct )

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**Q 41 :** 8. A particle starts from rest with acceleration $a=2t - 2$ in m/s², in which $t$ is in sec. The velocity of the particle after 5sec from the start is

     i.15m/s          ii.25m/s          iii. 5m/s          iv.None of Options 1 to 3

**Marks :** 1

**1 .** i          ✅ ( This Answer is Correct )

**2 .** ii

**3 .** iii

**4 .** iv

---

**Q 42 :** 13. Two forces of equal magnitude $F$ are acting on the same point at right angle to each other. The magnitude of resultant force is

     i.F          ii.2F          iii. more than F but less than 2F          iv.greater than $2F$

**Marks :** 1

**1 .** i

**2 .** ii

**3 .** iii          ✅ ( This Answer is Correct )

**4 .** iv

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**Q 43 :** 14. A vector parallel to $(-2i)$ is

     i. $(-2j)$          ii.$(-5i)$          iii.$(+12i)$          iv. both Options 2 and 3

**Marks :** 1

**1 .** i

2 . ii

3 . iii

**4 .** iv  ✅ ( This Answer is Correct )

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**Q 44 :** 15. What are the angles made by the vector $i+j+(\surd2)k$ with $X$, $Y$ and $Z$ axes respectively?

i.60°, 60°, 60°          ii.60°, 45°, 60°          iii.45°, 60°, 60°          iv.60°, 60°, 45°

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 .** iv  ✅ ( This Answer is Correct )

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**Q 45 :** 17. The component of a nonzero vector at a perpendicular direction is

i.equal to the magnitude of the vector     ii. equal to half of the magnitude of the vector

iii. zero                                    iv. None of Options 1 to 3

**Marks :** 1

1 . i

2 . ii

**3 .** iii  ✅ ( This Answer is Correct )

4 . iv

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**Q 46 :** 31.The kinetic frictional force developed between two surfaces depends on

i. the area of contact of two surfaces   ii. the relative velocity between the surfaces in contact

iii. the normal reaction acting on the contact surface     iv. all of options 1 to 3

**Marks :** 1

1 . i

2 . ii

**3 .** iii  ✅ ( This Answer is Correct )

4 . iv

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**Q 47 :** 35. An insect trapped in a circular groove of radius 12cm moves along the groove steadily and completes 7 revolutions in 100sec. What is the linear speed of the motion?

i.2.3cm/s          ii.5.3cm/s          iii.0.44m/s          ivNone of Options 1 to3

**Marks :** 1

1 . i

**2 .** ii  ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 48 :** 41. According to work-energy theorem , change in kinetic energy is equal to work done by

i. conservative force   ii. non-conservative force   iii. external conservative force   iv. all of options 1 to 3

**Marks :** 1

1 . i

2 . ii

3 . iii

☑ ( This Answer is Correct )

**4 .** iv

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**Q 49 :** 58. What percentage of length of a wire will increase by applying a tensile stress 9.8N.mm$^{-2}$ on it? ($Y=2\times10^{11}$N.m$^{-2}$)

    i. 0.0078%       ii. 0.0088%       iii. 0.0098%       iv. 0.0067%

**Marks :**   1

1 . i

**2 .** ii                                    ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 50 :** 65. In a stremline flow, the gravitational head is $h$. The kinetic head and pressure heads are given respectively as

    i. v²/g and p/ρ     ii. v²/(2g) and p/(ρg)     iii. v²/g and p/ρ     iv. v²/2 and p/ρ

**Marks :**   1

1 . i

**2 .** ii                                    ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 51 :** 72. A liquid with coefficient of volume expansion $\gamma$ is filled in a container of material having the coefficient of expansion $\alpha$. If the liquid overflows on heating, then

    i. γ= 3α       ii. γ> 3α       iii. γ< 3α       iv. γ= 3α³

**Marks :**   1

1 . i

**2 .** ii                                    ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 52 :** 73. The specific heat of a gas in an isothermal process can be taken as

    i. infinite       ii. zero       iii. negative       iv. constant

**Marks :**   1

**1 .** i                                     ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 53 :** 75. If $m$ is the mass of a body, $\theta$ is the temperature and $s$ is the specific heat of the material, then the heat capacity of the body is given by

    i. msθ       ii. mθ       iii. mθ/s       iv. ms

**Marks :**   1

1 . i

2 . ii

3 . iii

**4 .** iv                                    ☑ ( This Answer is Correct )

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**Q 54 :** 2. The length and breadth of a rectangular plane is given as, $l=(20\pm0.2)$cm and $b=(10\pm0.1)$cm. If the area is determined by this data, then the mean absolute error in measurement of area is

   i. 0.02cm²      ii. 0.01cm²      iii. 2cm²      iv. 4cm²

**Marks :** 1

1 . i

2 . ii

3 . iii

**4 . iv** ☑ ( This Answer is Correct )

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**Q 55 :** 4. Two objects are moving along the same straight line. They start from a point A with an acceleration $a$ and $2a$ with velocity $2u$ and $u$ respectively at time $t = 0$. The distance moved by each object up to the time when one overtakes the other is

   i. $6u^2/a$      ii. $2u^2/a$      iii. $4u^2/a$      iv. $8u^2/a$

**Marks :** 1

**1 . i** ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 56 :** 9. A cart is moving along a straight line with constant speed of 30m/s. A particle is to be fired vertically upwards from the moving cart in such a way that it returns to the cart at the same point on the cart from where it was projected after the cart has moved 80m. At what speed (relative to the cart) must the particle be fired?

   i. 10m/s      ii. $10\sqrt{2}$m/s      iii. (40/3)m/s      iv. None of Options 1 to 3

**Marks :** 1

1 . i

2 . ii

**3 . iii** ☑ ( This Answer is Correct )

4 . iv

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**Q 57 :** 10 . A body is thrown vertically upwards from the top of a tower. It reaches the ground in $t_1$ sec. If it is thrown vertically downwards from the same point with same speed, it reaches the ground in $t_2$ sec. If it is allowed to fall freely from the same point, then the time taken by it to reach ground is

   i. $(t_1+t_2)/2$      ii. $(t_1-t_2)/2$      iii. $\sqrt{(t_1 t_2)}$      iv. $\sqrt{(t_1 t_2)}$

**Marks :** 1

1 . i

2 . ii

**3 . iii** ☑ ( This Answer is Correct )

4 . iv

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**Q 58 :** 18. A bird is flying horizontally with speed 5km/h at a height of 500m above the ground. At the same time another bird is flying vertically upward from ground with a speed of $\sqrt{(11)}$km/h. What is the speed of the 2nd bird as seen by the 1st bird?

   i. 6km/h      ii. $5\sqrt{11}$km/h      iii. $(5 -\sqrt{11})$ km/h      iv. $(5 +\sqrt{11})$ km/h

**Marks :** 1

**1 . i** ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

---

**Q 59 :** 24. The speed of a projectile at its maximum height is $\sqrt{(3)}/2$ times the initial speed $u$. The range of the projectile is

   i. $\sqrt{3}u^2/(2g)$      ii. $u^2/(2g)$      iii. $3u^2/(2g)$      iv. $3u^2/g$

**Marks :** 1

✅ ( This Answer is Correct )

1 . i

2 . ii

3 . iii

4 . iv

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**Q 60 :**　27. A uniform rod of length *l* and mass *m* is kept on a smooth horizontal plane. If a horizontal force *F* is applied on the rod along its length, then what will be the force on the rod at point P shown in Figure Q27? (AP = *x*)



**Figure Q27**

i. F　　　　ii. zero　　　　iii. F(1-x/l)　　　　iv. Fm(1-x/l)

**Marks :**　1

1 . i

2 . ii

**3 . iii**　　　　　　　　　　✅ ( This Answer is Correct )

4 . iv

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**Q 61 :**　29. Three equal weights each of mass 4kg are hanging on a string passing over a fixed pulley as shown in Figure Q29. What is the tension in the string connecting weights B and C?



**Figure Q29**

i. zero　　　　ii. 13.3N　　　　iii. 26.6N　　　　iv. 19.6N

**Marks :**　1

1 . i

2 . ii

**3 . iii**　　　　　　　　　　✅ ( This Answer is Correct )

4 . iv

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**Q 62 :**　30. In Figure Q30, if ends P and Q of the inextensible string move downward with uniform speed *v*, then the mass M moves upward with speed



**Figure Q30**

i. vcosθ　　　　ii. v/cosθ　　　　iii. 2vcosθ　　　　iv. v/(2cosθ)

**Marks :**　1

1 . i

**2 . ii**　　　　　　　　　　✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 63 :**　1

32. When a horizontal force of 45N is applied on a body kept on a rough horizontal plane, it is seen that the acceleration of the body is $3 m/s^2$. If the mass of the body is 5kg, then what is the coefficient of kinetic friction of the system?

**Marks :**

   i. 0.8        ii. 0.7        iii. 0.6        iv. 0.5

1 . i

2 . ii

**3 .** iii      ☑ ( This Answer is Correct )

4 . iv

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**Q 64 :**    33. A block of mass 1kg is placed on the horizontal surface ($\mu$=0.6) of a truck, which is moving with acceleration 5m/s². The frictional force on block is

**Marks :**   1

   i.5N        ii.6N        iii.5.88N        iv. 8N

**1 .** i      ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 65 :**    40. The minimum stopping distance of a car moving with velocity $v$ is $x$. if the car is moving with velocity $2v$, then the minimum stopping distance is

**Marks :**   1

   i. $2x$        ii. $4x$        iii. $3x$        iv. $x$

1 . i

**2 .** ii      ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 66 :**    42. A force $F=3t i+5j$ in N acts on a body due to which its displacement varies as $S=2t^2i-5j$ in m. The work done by this force in 2sec is

**Marks :**   1

   i.32J        ii.24J        iii.46J        iv.20J

1 . i

**2 .** ii      ☑ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 67 :**    44. A body of mass 2kg falls from a height of 20m. What is the loss of potential energy?

**Marks :**   1

   i. 400J        ii.300J        iii. 200J        iv. 100J

**1 .** i      ☑ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 68 :**    45. A block of mass 16kg is moving on a frictionless horizontal surface with velocity 4m/s and comes to rest after pressing a spring. If the force constant of the spring is 100N/m then the compression in the spring is

**Marks :**   1

   i. 3.2m        ii. 1.6m        iii. 0.6m        iv. 6.1m

1 . i

✅ ( This Answer is Correct )

**2 .** ii

3 . iii

4 . iv

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**Q 69 :** 　46. A body of mass $m$ starting from rest from origin moves along $x$-axis with constant power $P$. The relation between velocity $v$ and distance $x$ travelled by the body　　　　　　　　　　　　　　**Marks :** 1

i. $x \propto v^{1/2}$　　　　ii. $x \propto v^2$　　　　iii. $x \propto v$　　　　iv. $x \propto v^3$

1 . i

2 . ii

3 . iii

**4 .** iv　　　　　　　　　　　　　　　　　　　✅ ( This Answer is Correct )

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**Q 70 :** 　48. A bomb of mass 9kg explodes into two pieces of mass 3kg and 6 kg. The velocity of 3kg piece is 16m/s. The kinetic energy of 6kg piece is　　　　　　　　　　　　　　**Marks :** 1

i. 768J　　　　ii.786J　　　　iii.192J　　　　iv.68J

1 . i

2 . ii

**3 .** iii　　　　　　　　　　　　　　　　　　　✅ ( This Answer is Correct )

4 . iv

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**Q 71 :** 　49. The moment of inertia of a body about a given axis is 1.2 kg-m². To produce a rotational kinetic energy of 1500J, an angular acceleration of 25 rad/s² must be applied about that axis for the duration of　　　　**Marks :** 1

i. 4s　　　　ii. 8s　　　　iii. 10s　　　　iv. 2s

**1 .** i　　　　　　　　　　　　　　　　　　　✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 72 :** 　51. The radius of the earth is about 6400km and that of the mars is 3200km. The mass of the earth is about 10 times mass of the mars. An object weighs 200N on the surface of the earth. Its weight on the surface of the mars is　　　　　　　　　　　**Marks :** 1

i. 80N　　　　ii. 40N　　　　iii. 20N　　　　iv. 8N

**1 .** i　　　　　　　　　　　　　　　　　　　✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 73 :** 　53. Two particles of equal masses $m$ go around a circle of radius $r$ under the action of their mutual gravitational attraction. The speed $v$ of each particle is　　　　　　　　　　　**Marks :** 1

i. $1/\{2\sqrt{(Gm)}\}$　　　ii. $\sqrt{\{Gm/(2r)\}}$　　　iii.$(1/2)\sqrt{(Gm/r)}$　　　iv. $2\sqrt{(Gm/r)}$

1 . i

2 . ii

**3 .** iii　　　　　　　　　　　　　　　　　　　✅ ( This Answer is Correct )

4 . iv

**Q 74 :** 55. If the distance between earth and sun is doubled, then the new time period of revolution is

i. 0.5 years      ii. 2√2 years      iii. 4 years      iv. 8 years

**Marks :** 1

1 . i

**2 .** ii      ✅ ( This Answer is Correct )

3 . iii

4 . iv

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**Q 75 :** 61. An object of weight $W$ and density $\rho$ is submerged in a fluid of density $\rho_1$. Its apparent weight is

i. $W(\rho-\rho_1)$      ii. $(\rho-\rho_1)/W$      iii. $W(1-\rho/\rho_1)$      iv. $W(1-\rho_1/\rho)$

**Marks :** 1

1 . i

2 . ii

**3 .** iii      ✅ ( This Answer is Correct )

4 . iv

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**Q 76 :** 62. The ratio of energy required to blow two bubbles of radii 4cm and 3cm in the same liquid is

i. 4:3      ii. 3:4      iii. 16:9      iv. 64:27

**Marks :** 1

1 . i

2 . ii

**3 .** iii      ✅ ( This Answer is Correct )

4 . iv

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**Q 77 :** 69. An iron metre rod is allowed an error of 2 part per million. If the coefficient of thermal expansion of iron is $10^{-5}°C^{-1}$, what is the maximum change in temperature that the rod can sustain?

i. ±0.2K      ii. ±0.02K      iii. ±0.1K      iv. ±0.01K

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 78 :** 70. 22g of $CO_2$ at 27°C is mixed with 16g of oxygen at 37°C. The temperature of the mixture is

i. 32°C      ii. 27°C      iii. 37°C      iv. 30°C

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 . iii

4 . iv

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**Q 79 :** 74. In an adiabatic process, the pressure $P$ and temperature $T$ of a monatomic gas are related as $P \propto T^c$, where the value of the index $c$ is

i. 2/5      ii. 5/2      iii. 3/5      iv. 5/3

**Marks :** 1

**1 .** i      ✅ ( This Answer is Correct )

2 . ii

3 .   iii

4 .   iv

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**Q 80 :**   76. 100g of ice is mixed with 100g water at 100°C. The final temperature of the mixture is                                      **Marks :**   1

i. 10°C                    ii. 20°C                    iii. 40°C                    iv. 30°C

**1 .**  i                                                          ✅ ( This Answer is Correct )

2 .   ii

3 .   iii

4 .   iv

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