(*d*) $2u^2 \sin(\alpha + \beta) \cos \alpha / g \cos^2 \beta$
(*e*) $g \cos \beta / 2\mu \sin(\alpha + \beta)$.

10.321. The range of projectile in above case is
(*a*) $2u \sin(\alpha - \beta)/g \cos \beta$
(*b*) $2u^2 \sin(\alpha - \beta) \cos \alpha / g \cos^2 \beta$
(*c*) $2u \sin(\alpha + \beta)/g \cos \beta$
(*d*) $2u^2 \sin(\alpha + \beta) \cos \alpha / g \cos^2 \beta$
(*e*) $g \cos \beta / 2u \sin(\alpha + \beta)$.

10.322. The direction of projectile for the range to be maximum on the inclined plane of 30° to horizontal should be
(*a*) 30° with vertical
(*b*) 45° with vertical
(*c*) 60° with vertical
(*d*) 30° with inclined plane
(*e*) none of the above.

10.323. Which of the following is not a scalar quantity
(*a*) time
(*b*) money
(*c*) weight of a body
(*d*) body's mass
(*e*) amount of work.

10.324. Which of the following is an example of a body undergoing translational equilibrium
(*a*) a body at rest on a table
(*b*) a body travelling in a circular path at a constant speed
(*c*) a body rotating with a constant angular speed about an axis
(*d*) a body sliding down a frictionless inclined plane
(*e*) a rock thrown vertically upward when it is at the top its path.

10.325. The frequency of a vibrating string is
(*a*) directly proportional to square of the tension
(*b*) inversely proportional to square of the tension
(*c*) inversely proportional to the diameter of the string
(*d*) directly proportional to the square root of the mass per unit length
(*e*) inversely proportional to the square root of the mass parameter for unit length.

10.326. When two systems are in resonance, then the following parameter for both is equal
(*a*) amplitude
(*b*) wavelength
(*c*) intensity
(*d*) frequency
(*e*) all of the above.

10.327. If a system in equilibrium consists of six equal concurrent coplanar forces, each force acting in a different direction, then the angle between any pair of forces is
(*a*) 30° (*b*) 45°
(*c*) 60° (*d*) 75°
(*e*) 90°.

10.328. Choose the correct statement
(*a*) no acceleration is produced in the body when it moves with a constant speed along a circle
(*b*) no work gets done on it when it moves with a constant speed along a circle
(*c*) no force acts on the body when the body moves with a constant speed along a circle
(*d*) its velocity remains constant when the body moves with a constant speed along a circle
(*e*) none of the above.

10.329. A bucket of water weighing 10 kg is pulled up from a well 20 metre deep by a rope weighing 1 kg/m length, then the work done is
(*a*) 200 kg-m (*b*) 400 kg-m
(*c*) 500 kg-m (*d*) 600 kg-m
(*e*) none of the above.

10.330. A ship will sink if it does not displace water equal to its own
(*a*) volume (*b*) density
(*c*) surface area (*d*) weight
(*e*) all of the above.

10.331. If the momentum of a given particle is doubled then its kinetic energy will
(*a*) be halved
(*b*) be doubled
(*c*) be quadrupled
(*d*) be same
(*e*) none of the above.

10.332. The atmosphere of earth is retained due to
(*a*) gravitational pull of earth
(*b*) outer molecular attraction forces on the molecule

(*c*) as a result of cohesion, adhesion, osmosis etc.
(*d*) spherical shape of earth
(*e*) mean speed of molecules being much less than the escape velocity.

10.333. If two bodies, one light and other heavy, have equal kinetic energy, which one has a greater momentum
(*a*) the heavy body
(*b*) the light body
(*c*) both have equal momentum
(*d*) unpredictable
(*e*) none of the above statement is correct.

10.334. The sum of kinetic and potential energy of a falling body
(*a*) is constant at all points
(*b*) varies from point to point
(*c*) is maximum at staring and goes on increasing
(*d*) is maximum at starting and then goes on decreasing
(*e*) is maximum at the end.

10.335. A 100 kg weight falls 10 cm on a 10 kg/cm spring. The spring will deflect by
(*a*) 10 cm (*b*) 5 cm
(*c*) 20 cm (*d*) $\sqrt{5}$ cm
(*e*) 2.5 cm.

10.336. Two railway wagons of masses 12 and 10 tonnes moving in the same direction at speeds 3 metres per second and 5 metres per second respectively collide and then move together. Their common speed is given by
(*a*) 3.91 m/sec (*b*) 2.75 m/sec
(*c*) 2.2 m/sec (*d*) 4.5 m/sec
(*e*) none of the above.

10.337. A glass marble drops from a height of 3 metres upon a horizontal floor. If the coefficient of restitution be 0.9, find the height to which it rises after impact
(*a*) 2.43 metre (*b*) 4.43 metre
(*c*) 1.22 metre (*d*) 0.61 metre
(*e*) none of the above.

10.338. A body is fired from point P and strikes at Q inside a smooth circular wall as shown in Fig. 10.32. It rebounds to point S. Coefficient of restitution will
(*a*) 0 (*b*) 1

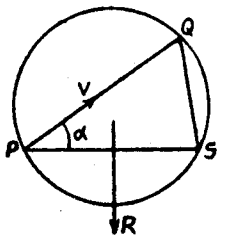

Fig. 10.32.

(*c*) α (*d*) $\tan\alpha$
(*e*) $\tan^2\alpha$.

10.339. The period of oscillation of a simple pendulum depends on
(*a*) mass of bob
(*b*) radius of bob
(*c*) density of bob
(*d*) its effective length
(*e*) all of the above.

10.340. A body is vibrating at 10 vibrations/sec in SHM of 10 cm amplitude. The maximum velocity in cm/sec can be
(*a*) 100π (*b*) 50π
(*c*) 200π (*d*) 100
(*e*) 200.

10.341. Three perfectly elastic and similar balls are lying on floor. When one is struck with velocity v, it strikes second and onwards third. What will be their resultant velocity at end
(*a*) v (*b*) $v/2$
(*c*) $v/3$ (*d*) $v/4$
(*e*) $v/6$.

10.342 In order to double the period of simple pendulum
(*a*) the mass of its bob should be doubled
(*b*) the mass of its bob should be quadrupled
(*c*) its length should be doubled
(*d*) its length should be quadrupled
(*e*) its length should be halved.

10.343 The period of vibration of a pendulum is least at sea level where the latitude is
(*a*) 30° (*b*) 45°
(*c*) 60° (*d*) 90°
(*e*) all of the above

10.344 Body executing *SHM* while passing through mean position will have kinetic and potential energies as follows

(*a*) maximum, minimum
(*b*) minimum, maximum
(*c*) zero, maximum
(*d*) maximum, maximim
(*e*) average, average.

10.345. In seconds pendulum, the pendulum executes
(*a*) one beat per second
(*b*) two beats per second
(*c*) ten beats per second
(*d*) half beat per second
(*e*) none of the above is correct.

10.346 In case of simple pendulum, the period of one oscillation is given by
(*a*) $\pi\sqrt{l/2g}$ (*b*) $\pi\sqrt{2l/g}$
(*c*) $2\pi\sqrt{l/g}$ (*d*) $2\pi\sqrt{l/2g}$
(*e*) $2\pi\sqrt{g/l}$.

10.347. In case of S.H.M. the period of oscillation is given by
(*a*) $T=\frac{2\omega}{\pi^2}$ (*b*) $T=\frac{2\pi}{\omega}$
(*c*) $T=\frac{\omega}{2\pi}$ (*d*) $T=\frac{\pi}{2\omega}$
(*e*) $T=\frac{\pi}{2\omega}$.

10.348. In S.H.M. the acceleration is proportional to
(*a*) displacement (*b*) velocity
(*c*) time period
(*d*) effective length of pendulum
(*e*) mass of particle.

10.349. In S.H.M. we have conservation of
(*a*) kinetic energy (*b*) potential energy
(*c*) momentum (*d*) total energy
(*e*) all of the above.

10.350. The motion of a particle, executing SHM, from one extremity to other constitutes
(*a*) one oscillation
(*b*) two oscillations
(*c*) four oscillations
(*d*) half an oscillation
(*e*) quarter oscillation.

10.351. Which one of the following laws is not applicable for a simple pendulum
(*a*) the time period does not depend on its magnitude
(*b*) the time period is proportional to its length (l)
(*c*) the time period is proportional to $\sqrt{l}$,
(*d*) the time period is inversely proportional to $\sqrt{g}$, where g is the acceleration due to gravity
(*e*) none of the above.

10.352. The value of acceleration due to gravity at moon is $g/6$, where g is the value of acceleration due to gravity at earth. The value of frequency of oscillation of simple pendulum on moon as compared to earth will be
(*a*) same (*b*) 6 times
(*c*) 1/6 times (*d*) $\sqrt{6}$ times
(*e*) $1/\sqrt{6}$ times.

10.353. A body in S.H.M. will have maximum velocity when its amplitude is
(*a*) maximum (*b*) –ve maximum
(*c*) zero (*d*) average
(*e*) at mid value.

10.354. The length of a Second's pendulum is
(*a*) 99.0 cm (*b*) 99.4 cm
(*c*) 100 cm (*d*) 101 cm
(*e*) 101.10 cm.

10.355. A clock with a seconds pendulum is gaining 3 minutes a day. To make it to go correctly
(*a*) length of the pendulum should be increased
(*b*) length of the pendulum should be decreased
(*c*) no change in the length of pendulum is required
(*d*) mass of bob should be increased
(*e*) mass of bob should be decreased.

10.356. If G is gauge of the track, v is velocity of the moving vehicle, g is the acceleration due to gravity and r is the radius of the circular path, the amount of super elevation required to the outer rail is
(*a*) $\frac{gr^2}{Gr}$ (*b*) $\frac{Gr^2}{gv}$
(*c*) $\frac{Gr^2}{gv^2}$ (*d*) $\frac{Gv^2}{gr}$
(*e*) none of the above.

10.357. A differential wheel and axle system consists of
(*a*) one big diameter wheel and one axle

(*b*) one big diameter wheel and two axles of different diameters
(*c*) two big wheels and two axles of different diameters
(*d*) two big wheels of different diameters and one axle
(*e*) none of the above.

10.358. If D be the diameter of wheel and D_1, D_2 the diameters of two axles, then velocity ratio is equal to
(*a*) $\frac{D}{D_1 - D_2}$ (*b*) $\frac{D}{2(D_1 - D_2)}$
(*c*) $\frac{2D}{D_1 - D_2}$ (*d*) $\frac{2D}{D_1 + D_2}$
(*e*) $\frac{D}{D_1 + D_2}$.

10.359. In planetary motion, following parameter remains constant
(*a*) angular velocity
(*b*) linear velocity
(*c*) angular acceleration
(*d*) total angular momentum
(*e*) angular speed.

10.360. The escape velocity on the surface of the earth is
(*a*) 1 km/sec (*b*) 3.6 km/sec
(*c*) 8.8 km/sec (*d*) 11.2 km/sec
(*e*) 14.9 km/sec.

10.361. The vehicle moving on a level circular path will exert pressure such that
(*a*) the reaction on the outer wheels will be more
(*b*) the reaction on the inner wheels will be more
(*c*) the reaction on the inner as well as outer wheels will be equal
(*d*) it depends upon the speed
(*e*) none of the above statement is correct.

10.362. The maximum efficiency of a screw jack with square threads and friction angle of 30° can be
(*a*) 100% (*b*) 50%
(*c*) 33% (*d*) 30%
(*e*) 11%.

10.363. A machine is said to be irreversible if its efficiency is
(*a*) 100% (*b*) 0%
(*c*) 50% (*d*) more than 50%
(*e*) less than 50%.

10.364. If l is the span of a light suspension bridge whose each cable carries total weight (w) and the central dip is y, the horizontal pull at each support is
(*a*) $\frac{wl}{4y}$ (*b*) $\frac{wi}{8y}$
(*c*) $\frac{wl}{2y}$ (*d*) wl
(*e*) $\frac{wl}{y}$.

10.365. Pick up the incorrect statement from the following. In case of a suspension bridge if there is a rise in temperature
(*a*) the dip of the cable will increase
(*b*) the length of the cable will increase
(*c*) the dip of the cable will decrease
(*d*) all of the above
(*e*) none of the above.

10.366. The value of gravitation constant G is equal to
(*a*) 6.66×10^{-8} (*b*) 6.66×10^{-3}
(*c*) 6.66×10^{3} (*d*) 6.66×10^{-10}
(*e*) 6.66×10^{-11}

10.367. If M be the mass of earth and R its radius then the intensity of gravitational field on the surface of the earth is
(*a*) $\frac{GM}{R}$ (*b*) $\frac{GM}{R^2}$
(*c*) $\frac{GM}{R^4}$ (*d*) $\frac{GR^2}{M}$
(*e*) $\frac{GR}{M^2}$.

10.368. If the speed of rotation of earth decreases, the weight of the body will
(*a*) increase (*b*) decrease
(*c*) remain same
(*d*) man increase/decrease depending on range of increase
(*e*) unpredictable.

10.369. Two cars are 10 km apart and moving in the same direction at speed of 40 km/hr. A car moving in opposite direction meets these cars at interval of 8 minutes. At what speed the other car is moving
(*a*) 75 km/hr (*b*) 60 km/hr
(*c*) 45 km/hr (*d*) 35 km/hr
(*e*) 30 km/hr.