ARULMIGU PALANIANDAVAR ARTS COLLEGE FOR WOMEN, PALANI

DEPARTMENT OF MATHEMATICS

DYNAMICS

Prepared by
Dr.V.P.ANUJA

ARULMIGU PALANIANDAVAR ARTS COLLEGE FOR WOMEN, PALANI.

DYNAMICS

UNIT - I

1._____ produces a change in the state of rest of a body or of its uniform motion in a straight line (Ans : Force)

2. Force has magnitude and _____and is therefore a vector quantity. (Ans : direction)

3. The _____ of a body of mass m and velocity is v is the vector mv. (Ans : Linear Momentum)

4. Say true or false
Every body continues in its state of rest,itis compelled by any external impressed force to change that state. (Ans : True)

5. Say true or false
The rate of change of momentum of a body is proportional to the impressed force and takes place in the direction in which the force acts. (Ans : True)

6. To every action there is always an equal and _____ reaction. (Ans : opposite)

7. The mutual reaction of any two bodies are always _____ and oppositely directed (Ans : Equal)

8.A body is at rest,which changes its state of rest by___(Ans : Force)

9. Newton's first law of motion is called the_____
(Ans : Principle of inertia)

10. Newton's second law of motion is called the _____.
(Ans : Physical independence of forces)

11. The _____units of force,as their values depend on the values of g. (Ans : Gravitational)

12. The absolute units of forces,their values are the same everywhere and do not depend on the _____ (Ans : Earths attraction)

13. The weight of a mass of 1 gram=_____ (Ans :981 dynes)

14. The weight of a mass of 1 Kilogram =____ (Ans : 9.81 Newtons)

15. Say true or false

The weight of the bodies at the same place are proportional to their masses. (Ans : True)

16. When the force acting on a particle is zero,in a certain direction, the momentum in that direction will remain ____ (Ans : constant)
17. The only force acting on a body due to its contact with the surface is normal to the surface and is called ___ (Ans :Normal Reaction)
18. When the forec acting on a body moves its _____,it is said to do work on the body. (Ans : Point of application)
19. The total work done by a force is equal to the sum of the works done by the _____of the force. (Ans : Components)
20. The practical unit of power in FPS system is called the _____ (Ans : Horse power)

UNIT - II

21. Motion of a particle projected into the air in any direction and with any velocity, such a particle is called a _____ (Ans : Projectile)
22. The two forces that act on the projectile are its_____and _____ of air. (Ans : weight ,Resistance)
23. Say True or False
    The angle of projection is the angle that the direction in which the particle is initially projected makes with the horizontal plane throughout the point of projection (Ans : True)
24. The range on a plane through the point of projection is the distance Between the point of Projection and the point where the _____meets the plane (Ans :Trajectory)
25. The _____ is the interval of time that elapses from the instant of projection. (Ans : Time of Flight)
26. The particle is on the inclined plane during time t ,the distance travelled perpendicular to the inclined plane is _____(Ans : Zero)
27. The acceleration due to gravity can be resolved into two_____ (Ans : Components)
28. The _____is the velocity with which the particle is projected. (Ans :velocity of projection)
29. The _____is the path which the particle describes. (Ans :Trajectory)

30. Say True or False
The horizontal velocity remains constant throughout the motion, there is no force to cause any acceleration in that direction
(Ans : True)

31. The vertical component of the velocity will be subject to a retardation g.(Ans : True)

32. The latus rectum is independent of the initial vertical velocity and depends only on the _____(Ans : Horizontal velocity)

33. Time taken to reach the greatest height is _____for the motion of Projectile. (Ans :usinα/g)

34. The maximum horizontal range is_____(Ans :u^2/g)

35. 45˚ is the _____to get maximum horizontal range with the same initial velocity.(Ans : angle of projection)

36. The path of a projectile is a _____(Ans : Parabola)

37. The ____is twice the time taken to reach the greatest height.
(Ans : Time of Flight)

38. 45˚ +$\frac{\boldsymbol{\beta}}{\mathbf{2}}$is the _____to get maximum horizontal range with the same initial velocity on the inclined plane.(Ans : angle of projection)

39. The range on the inclined plane is____.
(Ans : r = $\frac{2u^2\cos\alpha\sin(\alpha-\beta)}{g\cos^2\beta}$

40. The greatest distance of the projectile from the inlined plane is attained in half the_____ Ans : Time of Flight)

UNIT - III

41. The _____is one of large magnitude which acts for a very short period of time. (Ans : Impulsive Force)

42. The principle of energy must never be used in problems where _____occur.(Ans : impulsive forces)

43. The internal force which acts ,when a body tends to recover its original shape after a deformation is called _____
(Ans : the force of restitution)

44. The property which causes a solid body to recover its shape is called _____ (Ans : Elasticity)

45. If a body does not recover its shape it will cause no force of

restitution and such a body is called _____(Ans : inelastic)

46. When a body completele regains its shape after a collision ,it is said to be _____(Ans : perfectly elastic)

47. Two bodies are said to_____ when the direction of motion of each before impac is along common normal at the point where they touch. (Ans: impinge directly)

48. Two bodies are said to_____ when the direction of motion of either body or both is not along common normal at the point where they touch. (Ans: impinge obliquely)

49. The common normal at the point of contact is called the _____(Ans : Line of Impact)

50. The _____depends on the material of which the bodies are made and is independent of their mass.(Ans : Constant ratio)

51. The constant ratio is denoted by e,and is called the _____ (Ans : Coefficient of elasticity)

52. when the constant ratio e=0 is said to be _____while for perfectly elastic bodies (Ans: inelastic)

53. The algebraic sum of the momenta of the impinging bodies after impact is _____ to the algebraic sum of their momenta before impact.(Ans : equal)

54. If an _____strikes a plane normally with velocity u,it will rebound in the same direction with velocity eu (Ans : elastic sphere)

55. The impulse of the pressure on the plane is equal and opposite to the impulse of the pressure on the _____(Ans : Sphere).

56. If the sphere is perfectly elastic e=1 and the loss of _____is zero(Ans: Kinetic Energy)

57. If the two spheres are _____and of equal mass then e=1 and m1=m2 (Ans:perfectly elastic)

58. If two equal _____impinge,they interchange their velocities in the direction of the line of centres. (Ans : Perfectly elastic spheres)

59. Say true or False

The principle of conservation of energy will hold good in problems of impact.(Ans: False)

60.The particle is disturbed vertically from its position of _____,it is found that it oscillates to and fro about this position.
(Ans : Equilibrium)

UNIT - IV

61.The particle has an acceleration which is always directed towards the equilibrium position and varies in magnitude as the distance of the particle from that position its motion is called _____
(Ans : Simple Harmonic Motion)

62.The transverse vibration of a plucked violin string is a example of _____ (Ans : Simple Harmonic Motion)

63. $\frac{d^2x}{dt^2} = -\mu x$ is the fundamental _____of Simple Harmonic Motion.(Ans :Differential equation)

64.The _____of the oscillation is the number of complete oscillations that the particle makes in one second. .(Ans :Frequency)

65.Maximum acceleration corresponds to the greatest value of x,it is Numerically ____.(Ans : μ.amplitude)

66.The greatest value of v is got at x=0,and it is __(Ans : $\sqrt{\mu}$.amplitude)

67.The distance through which the particle moves away from the centre of motion on either side of it is called the _____of the oscillation.(Ans : Amplitude)

68.If the angle of oscillation is small,the motion of the _____is simple harmonic.(Ans : Simple Pendulum)

69.The time of oscilation depends on the _____through which the string swings on either side of the vertical.(Ans : Angle)

70.The simple pendulum which oscilates in the same time as the given pendulum is called the _____
(Ans : Simple Equivalent Pendulum)

71.The maximum angular displacement is α,the periodof oscillation of a simple pendulum is _____(Ans : $2\pi\sqrt{l/g}\ [1+1/4\ \sin^2\alpha/2]$

72.The length of the simple equivalent pendulum is_____(Ans : g/μ.)

73.The period of oscillation T of a simple pendulum of length l is given by_____(Ans : $T=2\pi\sqrt{l/g}$)

74.Frequency is the reciprocal of the period and is equal to_____.

(Ans :$\sqrt{\mu}/2\pi$)

75.A seconds pendulum is one whose _____ of oscillation is 2 seconds. (Ans : period)

76.Length of the seconds pendulum is _____(Ans:l=$\frac{g}{\pi^2}$)

77.In simple harmonic motion of a simple pendulum,the component of weight which is directed towards mean position is_____. (Ans : mgsinθ)

78.The velocity of bob in SHM becomes_____ at extreme position. (Ans : Zero)

79. The velocity of a particle moving with SHM is_____ at the mean position. (Ans : Maximum)

80.The bob of the pendulum moves faster at the lowest position for a larger amplitude (Ans : True)

UNIT - V

81.The radical component of v is a vector with modulus r and _____ (Ans : Amplitude θ)

82.The _____of v is a vector with modulus rθ and amplitude $\varphi=\ \pi/2+\theta$ (Ans : Transverse component)

83.The radial components of acceleration is _____(Ans : $\ddot{r}$-r $\dot{\theta}^2$)

84._____is the polar equation to the equiangular spiral. (Ans : r=a$e^{\theta\cot\alpha}$)

85.A particle describes by a path ,acted on by an attractive force F towards a fixed point zero, such a force is called a_____ (Ans : central Force)

86.A particle describes a path is called _____(Ans : Central Orbit)

87.The relation between the perpendicular from the pole on the tangent and radius vector is very simple,such a relation is called the _____(Ans : pedal Equation)

88._____is the (p,r) equation to the central orbit. (Ans : P= $\frac{h^2}{p^3}\frac{dp}{dr}$

89.The pedal equations of the circle for a general position of the pole

is _____ (Ans : $c^2=r^2+a^2-2ap$)

90._____is the (p,r) equation to the ellipse(Ans: $\frac{b^2}{p^2}=\frac{2a}{r}$ -1)

91._____is the (p,r)equation to the spiral.(Ans : $p=r\sin\alpha=kr$)

92.The rate of description of the area traced out by the radius vector joining the particle to a fixed point is called the _____of the particle.(Ans : Areal velocity)

93.Say true or false
The equal areas are described the radius vector in equal times (Ans : True)

94.The polar equation to the ellipse is _____(Ans : $\frac{1}{r}$ = 1+ecosθ)

95._____is a equation of rectangular hyperpola (Ans : $r^2\cos2\theta=a^2$)

96.The _____varies inversely as the square of the distance from the pole.(Ans : Force)

97. Say true or False
If every central orbit the areal velocity is constant. (Ans : True)

98.The _____varies inversely as the perpendicular from the centre upon the tangent to the path.(Ans : Linear Velocity)

99. In the pedal equations of the circle $c^2=r^2+a^2-2ap$,when c=a,the pole is on the and the _____equation is $r^2=2ap$
(Ans : circumference)

100.$\frac{p}{h^2u^2}$= u+$\frac{d^2u}{d\theta^2}$ is the differential equation of a _____in polar coordinates .(Ans : central Orbit)

V.P.

Staff in charge

Dr.K.MEENA M.Sc.,M.Phil.,PGDCA .,Ph.D.,
Assistant Professor and Head
Department of Mathematics
Arulmigu Palaniandavar Arts College for Women,
Chinakalayamputhur,Palani-624615

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