1. A stone tied to string is rotated in a vertical circle. The minimum speed with which the string has to be rotated
   (a) Decreases with increasing mass of the stone
   (b) Is independent of the mass of the stone
   (c) Decreases with increasing in length of the string
   (d) Is independent of the length of the string

2. A ball is thrown vertically upwards. If air resistance is taken into account the time reaching maximum height
   (a) Is equal to time for falling (b) is less than time for falling
   (c) is greater than time for falling (d) none

3. An object start sliding on a frictionless inclined plane and from the same height another object stats falling freely :
   (a) Both will reach with same speed
   (b) Both will reach with same acceleration
   (c) Both will reach in same time
   (d) None of above

4. A coin falls faster than a scrap of paper when dropped from the same height because of coin :
   (a) Value of g is more (b) Value of g is less
   (c) Air resistance is less (d) none of these

5. The slope of the distance-time graph of two bodies are 30^o and 60^o. Their velocities are in ratio :
   (a) $1:\sqrt{3}$ (b) $3:\sqrt{3}$
   (c) 3 : 1 (d) 1 : 3

6. The linear momentum of a body changes at the rate of 10 kg ms^{-1}. Force acting on the body is
   (a) 1N (b) 10 N
   (c) 1 kg f (d) 10 kg f

7. The correct relation between absolute units of force on MKS system and CGS system is
   (a) 1 kgf = 9.8 N (b) 1 kg f = 1000 gf
   (c) 1 gf = 980 dyne (d) 1 N = 10^5 dyne

8. Accelerated motion is always due to
   (a) Internal force (b) friction
   (c) external force (d) none of the above

9. The dimensional formula of impulse is
   (a) $[ML^2T^{-2}]$ (b) $[MLT^{-2}]$
   (c) $[ML^2T^{-1}]$ (d) $[MLT^{-1}]$

10. For a given change in linear momentum, when time of impact increases, force
    (a) Decreases (b) increases
    (c) Remains same (d) none of the above

11. Calculate the work done, if a wire is loaded by `Mg weight and the increase in length is `l'.
    (a) Mgl (b) zero (c) Mgl/2 (d) 2Mgl

12. On stretching a wire, the elastic energy stored per unit volume is
    (a) FI/2AL (b) FA/2L (c) FL/2A (d) FL/2

13. A and B are two wires. The radius A is twice that of B. They are stretched by the some load. Then the stress on B is
    (a) Equal to that on A (b) Four times that on A
    (c) Two times that on A (d) Half that on A

14. If the force constant of a wire is K, the work done in increasing the length of the wire by l
    (a) KI/2 (b) KI (c) $KI^2/2$ (d) KI^2

15. The Young's modulus of a wire is Y. If the energy per unit volume is E, then the strain will be
(a) $\sqrt{2E/y}$ (b) $\sqrt{2EY}$ (c) EY (d) E/Y

16. The velocity of heat radiation in vacuum is
(a) Equal to that of light (b) Less than that of light
(b) Greater than that of light (d) Equal to that of sound

17. In which process, the rate of transfer of heat is maximum
(a) condition (b)convection (c) radiation
(d)In all these, heat is transferred with the same radiation

18. According to Wein's law
(a) $\lambda_m T = \text{constant}$ (b) $\frac{\lambda_m}{T} = \text{constant}$
(c) $\frac{T}{\lambda_m} = \text{constant}$ (d) $T + \lambda_m = \text{constant}$

19. On increasing the temperature of a substance gradually, which of the following colours will be noticed by you?
(a) White (b Yellow
(c) Green (d) Red

20. Newton's law of cooling is used in laboratory for the determination of the
(a) Specific heat of the gases (b) the latent heat of gases
(b) Specific heat of liquids (d) latent heat of liquids

21. A geostationary satellite orbits around the earth in a circular orbit of radius 36000 km. Then, the time period of a spy satellite orbiting a few hundred kilometers above the earth's surface (R_{earth}=6400 km) will approximately be
(a) 1/2 hr (b) 1 hr
(c) 2 hr (d) 4hr

22. As observed from earth, the sun appears to move in an approximate circular orbit. For the motion of another planet like mercury as observed from earth, this would
(a) be similarly true
(b) not be true because the force between earth and mercury is not inverse square law.
(c) Not be true because the major gravitational force on mercury is due to sun.
(d) not be true because mercury is influenced by forces other than gravitational forces.

23. Both earth and moon are subject to the gravitational force of the sun. As observed from the sun, the orbit of the moon
(a) Will be elliptical
(b) Will not be strictly elliptical because the total gravitational force on it is not central.
(c) Is not ellipse but will necessarily be a closed curve.
(d) Deviates considerably from being elliptical due to influence of planets other than earth.

24. A particle hanging from a spring stretches it by 1 cm at earth's surface. How much the same particle stretches the spring at a place 1600 km above the surface of earth (R = 6400 km)
(a) 16/50 cm (b) 16/25 cm
(c) 25/16 cm (d) 50/16 cm

25. The ratio of radii of earth to another planet is 2/3 and the ratio of their mean densities is 4/5. If an astronaut can jump to a maximum height of 1.5 m on the earth, with the same effort, the maximum height he can jump on the planet is
(a) 1m (b) 0.8m
(c) 0.5 m (d) 1.25 m (e) 2m

26. A particle starts S.H.M. from the mean position. Its amplitude is A and time period is T. At the time when its speed is half of the maximum speed, its displacement y is
(a) A/2 (b) $A/\sqrt{2}$

(c) $A\sqrt{3}/2$ (d) $2A/\sqrt{3}$

27. In a stationary wave, all particles are
(a) At rest at the same time twice in every period of oscillation
(b) At rest at the same time only once in every period of oscillation
(c) Never at rest at the same time
(d) Never at rest at all

28. In stationary waves, antinodes are the points where there is
(a) Minimum displacement and minimum pressure change
(b) Minimum displacement and maximum pressure change
(c) Maximum displacement and maximum pressure change
(d) Maximum displacement and minimum pressure change

29. Which of the property makes difference between progressive and stationary waves
(a) Amplitude (b) Frequency
(c) Propagation of energy (d) Phase of the wave

30. The equation of displacement of two waves are given as $y_1 = 10\sin\left(3\pi t + \frac{\pi}{3}\right)$ $y_2 = 5\left(\sin 3\pi t + \sqrt{3}\cos 3\pi t\right)$. Then what is the ratio of their amplitudes
(a) 1:2 (b)2:1
(b) (c) 1:1 (d) none of these

31. Beta rays emitted by a radioactive material are
(a) Electromagnetic radiation
(b) the electrons orbiting around the nucleus
(c) Charged particles emitted by nucleus (d) Neutral particles

32. The radioactivity of a certain radioactive element drops to 1/64 of its initial value in 30 seconds. Its half life is
(a) 2 sec (b) 4 sec
(c) 5 sec (d) 6 sec

33. Which of the following is in the increasing order for penetrating power?
(a) α,β,γ (b) β,α,γ
(c) γ,α,β (d) γ,β,α

34. The half life (T) and the disintegration constant (λ) of a radioactive substance are related as
(a) $\lambda T = 1$ (b) $\lambda T = 0.693$
(c) $\frac{T}{\lambda} = 0.693$ (d) $\frac{\lambda}{T} = 0.693$

35. A radioactive substance has a half life of 1 year. The fraction of this material, that would remain after 5 years will be
(a) $\frac{1}{32}$ (b) $\frac{1}{5}$
(c) $\frac{1}{2}$ (d) $\frac{4}{5}$

36. The conduction band in a solid is partially filled at 0 K. the solid sample is
(a) conductor (b) semiconductor
(b) insulator (d) none

37. In good conductors of electricity the type of bonding that exists is
(c) Ionic (b) vander waals
(c) Covalent (d) metallic

38. In intrinsic semiconductor at room temperature, the number of electrons and holes are
(a) equal (b) zero
(a) unequal (d) infinite

39. n-type semiconductor is obtained when
(a) germanium is doped with arsenic (b) germanium is doped with indium

(c) germanium is doped with aluminium (d) silicon is doped with indium

40. A p-type semiconductor is obtained by doing silicon with
(a) germanium (b) gallium
(b) bismuth (d) phosphorus

41. Unit vector of $\vec{A}$ is
(a) $\hat{A} = \vec{A}|\vec{A}|$ (b) $\hat{A} = \frac{|\vec{A}|}{\vec{A}}$
(c) $\hat{A} = \frac{\vec{A}}{|\vec{A}|}$ (d) $\hat{A} = |\vec{A}|$

42. The angle between two equal vector is
(a) 0° (b) 60°
(c) 90° (d) 180°

43. The angle between two vectors of equal magnitudes whose resultant is equal to the magnitude of the either vector is
(a) 30° (b) 60°
(c) 90° (d) 120°

44. The position vector of a particle is given by
$\vec{r} = \left(2\hat{i} + 3\hat{j} + 4\hat{k}\right)$ m The magnitude of the position is given by
(a) 4 m (b) $\sqrt{13}$ m
(c) $\sqrt{26}$ m (d) $\sqrt{29}$ m

45. The instantaneous coordinates of a particle are x = (4t)m and y = ($8t^2$)m. The acceleration of the particle is
(a) 16 m s^{-2} (b) 2 m s^{-2}
(c) 8 m s^{-2} (d) 12 m s^{-2}

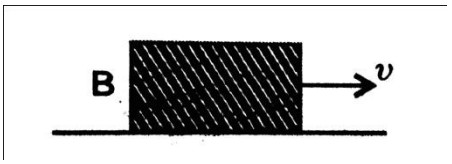
46. If external force on a body is zero, its
(a) displacement is zero (b) velocity is zero
(c) acceleration is zero (d) none of these

47. The physical quantity which is equal to the change in momentum of a body is known as
(a) force (b) acceleration
(c) impulse (d) reaction

48. Action and reaction
(a) act on the same body
(b) are equal and act in the same direction
(c) cancel each other
(d) act on two different bodies.

49. The dimensional formula of impulse is
(a) $[MLT^{-1}]$ (b) $[MLT^{-2}]$
(c) $[ML^{-1}T]$ (d) $[ML^{-2}T]$

50. A block B is pushed momentarily along a horizontal surface with an initial velocity υ. If μ is the coefficient of sliding friction between B and the surface, block B will come to rest after a time.



(a) υ/gu (b) gu/υ
(c) g/υ (d) υ/g

IMU-CET
PHYSICS SAMPLE QUESTIONS – VOL.02

KEY ANSWERS:

1	**B**	**11**	**C**	**21**	**C**	**31**	**C**	**41**	**C**
2	**B**	**12**	**A**	**22**	**C**	**32**	**C**	**42**	**A**
3	**A**	**13**	**B**	**23**	**B**	**33**	**A**	**43**	**D**
4	C	**14**	**C**	**24**	**B**	**34**	**B**	**44**	**D**
5	D	**15**	**A**	**25**	**B**	**35**	**A**	**45**	**A**
6	**B**	**16**	**A**	**26**	**C**	**36**	**A**	**46**	**C**
7	**D**	**17**	**C**	**27**	**A**	**37**	**D**	**47**	**C**
8	**C**	**18**	**A**	**28**	**D**	**38**	**A**	**48**	**D**
9	**D**	**19**	**A**	**29**	**C**	**39**	**A**	**49**	**A**
10	**A**	**20**	**C**	**30**	**C**	**40**	**B**	**50**	**A**