Code No.	V – 2386

Common Entrance Examination for Admission to Four Year Under Graduate Programmes in the Teaching Departments of the University of Kerala, 2025

CSS

PHYSICS

For office use only

General Instructions

1. The Question Paper is having **40 Objective Questions**, each carrying **Four marks**.
2. The answers are to be (✓) 'tick marked' only in the "Response Sheet" provided.
3. **Negative marking** : **1 mark will be deducted for each wrong answer .**

Time : 1 Hour **Max. Marks : 160**

To be filled in by the Candidate											
Register Number	in Figures										
	in words										

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Choose appropriate answer from the options in the questions.

(40 × 4 = 160 marks)

1. The dimensional formula for pressure is

A. $\left[M L^{2} T^{0}\right]$ B. $\left[M L^{-1} T^{-2}\right]$

C. $\left[M L^{-2} T^{-2}\right]$ D. $\left[M L^{1} T^{2}\right]$

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2. If a body is moving with uniform velocity, its acceleration is:

   A. Positive
   B. Negative
   C. Zero
   D. Infinite

3. A car starts from rest and accelerates uniformly at $3 m/s^2$. How far will it travel in 5 seconds?

   A. 25 m
   B. 37.5 m
   C. 50 m
   D. 75 m

4. The slope of a displacement-time graph gives:

   A. Acceleration
   B. Velocity
   C. Displacement
   D. Distance

5. If the net external force on a system is zero, the momentum of the system:

A. Increases
B. Decreases
C. Remains constant
D. Is zero

6. A bullet of mass 50g is fired from a gun with a velocity of 400 m/s. If the gun's mass is 5 kg. Calculate the recoil velocity of the gun.

A. – 4 m/s
B. 6 m/s
C. – 2 m/s
D. – 8 m/s

7. A person in a lift moving downward with uniform acceleration feels:

A. Lighter than usual
B. Heavier than usual
C. No change in weight
D. Weightless

8. When a body falls freely under gravity, the total mechanical energy:

A. Increases
B. Decreases
C. Remains constant
D. Becomes zero

9. A man pushes a wall and fails to displace it. The work done by the man is:

A. Zero
B. Negative
C. Positive
D. Infinite

10. An electric motor delivers 2 kW of power. How much work does it do in 10s?

A. 2 J
B. 2000 J
C. 20000 J
D. 5000 J

11. If no external force acts on a system of particles, the center of mass:

A. Moves with constant velocity
B. Moves with variable velocity
C. Remains at rest
D. Accelerates uniformly

12. A bomb initially at rest explodes into two fragments of masses 3 kg and 2 kg. If the 3 kg fragment moves with a velocity of 5 m/s, the velocity of the 2 kg fragment is:

A. 5 m/s
B. – 5 m/s
C. – 7.5 m/s
D. 7.5 m/s

13. A man of mass 60 kg is standing on a cart of mass 240 kg. If the man walks on the cart with a velocity of 1 m/s relative to the cart, the velocity of the cart relative to the ground is:

A. 0.25 m/s
B. – 0.25 m/s
C. 1.25 m/s
D. – 1.25 m/s

14. For a rigid body rotating about a fixed axis, the velocity of the center of mass is:

A. Equal to the tangential velocity of any point
B. Zero
C. Equal to the angular velocity times the radius
D. Independent of the rotation

15. The moment of inertia of a solid sphere about its diameter is:

A. $\frac{2}{5}MR^2$
B. $\frac{3}{5}MR^2$
C. $\frac{2}{3}MR^2$
D. $\frac{3}{7}MR^2$

16. What happens to the gravitational force if the distance between two objects is halved?

A. It becomes one-fourth
B. It doubles
C. It becomes four times
D. It remains the same

17. The value of acceleration due to gravity at a height h = 640km above the Earth's surface is closest to:

A. 9.0 m/s^2
B. 7.8 m/s^2
C. 8.5 m/s^2
D. 6.5 m/s^2

18. Escape velocity for a body on Earth depends on:

A. Mass of the body
B. Mass and radius of the Earth
C. Both A and B
D. Only the mass of the Earth

19. The angle of contact between a liquid and a solid is 90° when the:

A. Liquid completely wets the solid
B. Liquid does not wet the solid
C. Adhesive and cohesive forces are equal
D. Surface tension is zero

20. In capillary rise, the height of the liquid column is inversely proportional to:

A. Surface tension
B. Density of the liquid
C. Radius of the capillary
D. Angle of contact

21. Work done during the isothermal compression of an ideal gas is given by:

A. $W = nRT \ln \frac{v_f}{v_i}$
B. $W = - nRT \ln \frac{v_f}{v_i}$
C. $W = nRT \ln \frac{p_f}{p_i}$
D. $W = - nRT \ln \frac{p_f}{p_i}$

22. The mean free path of a gas molecule increases when:

A. Pressure increases
B. Temperature increases
C. Number density of molecules increases
D. Molecular size increases

23. The potential energy in SHM is maximum when the particle is at:

A. Equilibrium position
B. Mean position
C. Extreme position
D. Halfway between equilibrium and extreme position

24. If the frequencies of two waves are 256 Hz and 260 Hz, the beat frequency is:

A. 4 Hz
B. 2 Hz
C. 8 Hz
D. 516 Hz

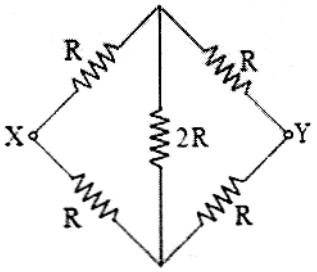
25. A system of charges has net zero charge. Which of the following statements is true about the electric force and field at any point outside the system?

A. Both force and field are always zero
B. Force is zero, but the field may not be zero
C. Field is zero, but the force may not be zero
D. Neither force nor field is necessarily zero

26. If the distance between two charges is tripled, the electrostatic force between them will become:

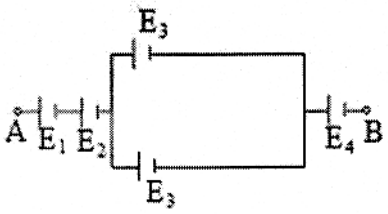
A. Nine times stronger
B. Three times weaker
C. One-ninth of the original force
D. One-third of the original force

27. For following circuit value of total resistance between *X* and *Y* is



A. R
B. 2 R
C. 4 R
D. 6 R

28. In the following circuit resultant emf between *AB* is



A. $E_1 + E_2 + \left(\frac{E_3}{2}\right) + E_4$
B. $E_1 + E_2 + \left(\frac{E_3}{4}\right) + E_4$
C. $E_1 + E_2 + (2E_3) + E_4$
D. $E_1 + E_2 + E_3 + E_4$

29. The magnetic field inside a toroidal solenoid depends on:

A. The number of coils only

B. The current and number of coils per unit length

C. The magnetic permeability of the core

D. The current and radius of the toroid

30. Which of the following is an example of a diamagnetic material?

A. Iron

B. Copper

C. Aluminum

D. Cobalt

31. An AC generator produces a maximum emf of 120 V. The rms value of the emf is:

A. 120 V

B. 83.44 V

C. 75.44 V

D. 85.44 V

32. In a transformer, the power transferred from the primary to the secondary coil remains the same, provided:

A. The frequency is constant

B. The coils are made of the same material

C. There is no energy loss

D. The impedance is the same on both sides

33. The visible spectrum of light ranges from:

A. 400 nm to 700 nm

B. 1 nm to 400 nm

C. 700 nm to 1000 nm

D. 10 nm to 100 nm

34. A lens has a focal length of 20 cm. If the object is placed 10 cm away from the lens, what is the image distance?

A. 10 cm

B. 20 cm

C. – 20 cm

D. – 40 cm

35. The resolving power of a microscope depends on:
    A. Wavelength of light used
    B. Numerical aperture of the lens
    C. Both A and B
    D. None of the above

36. In the Davisson-Germer experiment, the diffraction pattern observed for electrons proved that:
    A. Electrons have particle nature
    B. Electrons have wave nature
    C. Electrons do not have a definite mass
    D. Electrons cannot be accelerated

37. The decay of a radioactive substance follows:
    A. A linear law
    B. A logarithmic law
    C. An exponential law
    D. A quadratic law

38. The binding energy per nucleon generally increases with the atomic mass number until:
    A. Iron (Fe)
    B. Helium (He)
    C. Uranium (U)
    D. Oxygen (O)

39. In a forward biased diode, the width of the depletion region:
    A. Increases
    B. Decreases
    C. Remains constant
    D. Becomes zero

40. Which of the following statements is correct about a forward-biased pn-junction diode?
    A. The majority carriers in the p-region move towards the n-region
    B. The minority carriers in the p-region move towards the n-region
    C. The junction capacitance is at its maximum
    D. The reverse current becomes equal to the forward current

RESPONSE SHEET

1	A	B	C	D	E	11	A	B	C	D	E	21	A	B	C	D	E	31	A	B	C	D	E
2	A	B	C	D	E	12	A	B	C	D	E	22	A	B	C	D	E	32	A	B	C	D	E
3	A	B	C	D	E	13	A	B	C	D	E	23	A	B	C	D	E	33	A	B	C	D	E
4	A	B	C	D	E	14	A	B	C	D	E	24	A	B	C	D	E	34	A	B	C	D	E
5	A	B	C	D	E	15	A	B	C	D	E	25	A	B	C	D	E	35	A	B	C	D	E
6	A	B	C	D	E	16	A	B	C	D	E	26	A	B	C	D	E	36	A	B	C	D	E
7	A	B	C	D	E	17	A	B	C	D	E	27	A	B	C	D	E	37	A	B	C	D	E
8	A	B	C	D	E	18	A	B	C	D	E	28	A	B	C	D	E	38	A	B	C	D	E
9	A	B	C	D	E	19	A	B	C	D	E	29	A	B	C	D	E	39	A	B	C	D	E
10	A	B	C	D	E	20	A	B	C	D	E	30	A	B	C	D	E	40	A	B	C	D	E

ROUGH WORK

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