



# PHYSICS

## BOOKS - AIIMS PREVIOUS YEAR PAPERS

### AIIMS 2018 PAPER 2

Physics

1. Which of the following produces virtual image :

A. Simple microscope

B. Ordinary camera

C. Projector

D. Cinemascope

**Answer: A**



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2. What is the distance of centre of mass of a half ring from centre if the ring has radius  $= 0.5 \text{ m}$  [XI]

A.  $\frac{1}{\pi}$

B.  $\frac{1}{3\pi}$

C.  $\frac{2}{3\pi}$

D.  $\frac{1}{2\pi}$

**Answer: A**



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**3.** A cart of mass 150 kg is pulled horizontally on a frictionless surface with force 10 N. If 100 g/s sand is being dropped in the cart vertically

then find the speed of the system when cart has 100 kg sand in it.

A. 10 m/s

B. 20 m/s

C. 40 m/s

D. 50 m/s

**Answer: C**



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4. A needle of length  $l$  m and mass  $m$  kg is placed horizontal on water surface having surface tension  $T$ . Find  $T$  in terms of  $m$ ,  $l$  ( $g$  acceleration due to gravity)

A.  $T = \frac{mg}{2l}$

B.  $T = \frac{mg}{l}$

C.  $T = \frac{3mg}{2l}$

D.  $T = \frac{m}{2l}$

**Answer: A**



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5. An infinite wire having charge density  $\lambda = 10 \text{ n C/m}$  is moving along its axis with speed  $100 \text{ m/s}$ . Find magnetic field at a distance  $4 \text{ cm}$  perpendicular to wire.



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6. In a series RC circuit having battery of  $12 \text{ V}$ , capacitor is charged from  $0$  to  $6 \text{ V}$  in  $0.1 \text{ s}$ . Find value of resistance  $R$ .



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7. A unpolarised light is passed through 3 polarisers. If the second polariser is at an angle  $30^\circ$  with the first and the third polariser is at an angle  $60^\circ$  with the second. Find the final intensity of the light passed through this combination in initial intensity was  $I$ .



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**8.** If intensity in YDSE is 50 % of maximum at a point. Calculate the path difference.

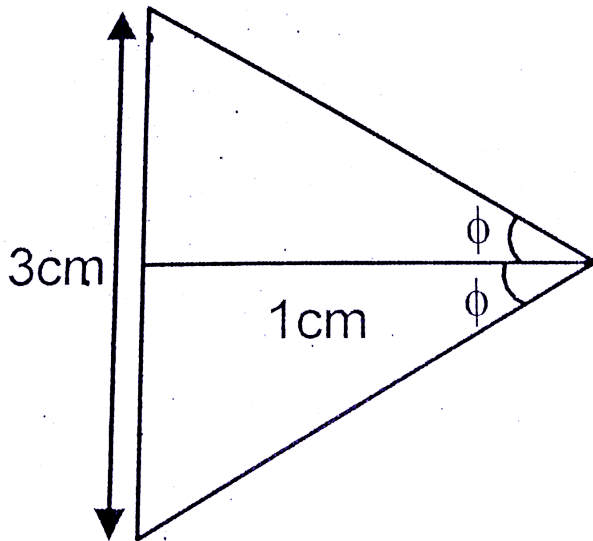


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**9.** A wire of length 3 cm has current 1 amp. Find magnetic field at a perpendicular



distance a cm from centre of wire



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10. What is the maximum wavelength for Balmer series in H atom.

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11. What is the velocity of electron in second orbital of  $He^+$  ion.



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12. A man (mass =50 kg) is in an elevator with is moving with acceleration  $0.49m / s^2$  upwards. Find normal reaction exerted by man on floor of the elevator.

A.  $214.5N$

B.  $314.5N$

C.  $414.5N$

D.  $514.5N$

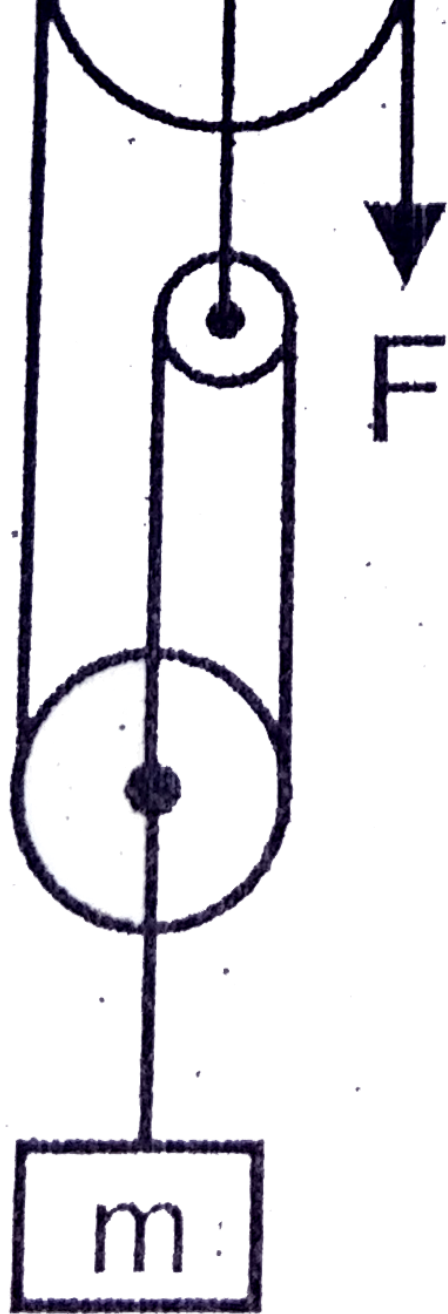
**Answer: D**



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**13.** In the block moves up with constant velocity  $v$  m//s. Find  $F$





A.  $F = \frac{mg}{2}$

B.  $F = \frac{2mg}{3}$

C.  $F = \frac{mg}{3}$

D.  $F = \frac{m}{3}$

**Answer: C**



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**14.** A solid non-conduction cylinder of radius  $R$  is charge such that volume charge density is proportion to  $r$  where  $r$  is distance from axis.

The electric field  $E$  at a distance  $r$  ( $r < R$ ) will depend on  $r$  as.



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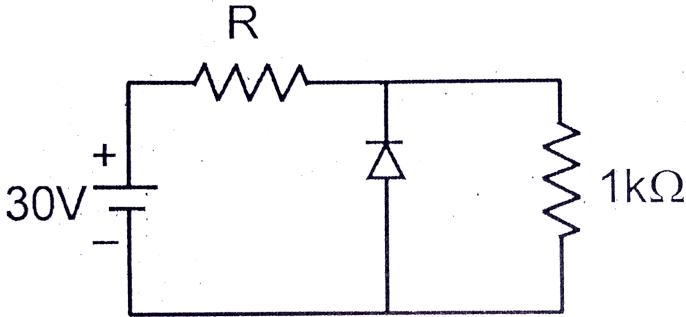
**15.** If  $n$  inductor of inductance  $L$ , radius  $r$ , current changes from  $I_0$  to  $I_2$ . Find work done.



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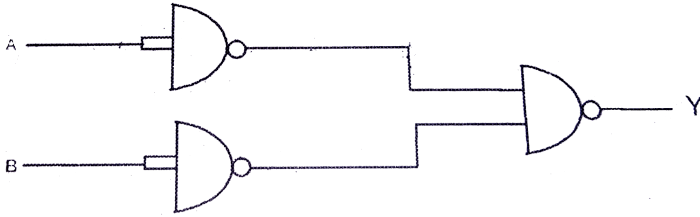
16. If current in diode is five times that in  $R_1$ .

Breakdown voltage of diode is 6 volt. Find  $R = ?$



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17. What is the out put of the given logic gate



A.  $A.B$

B.  $\bar{A}. var B$

C.  $\bar{A} + \bar{B}$

D.  $A + B$

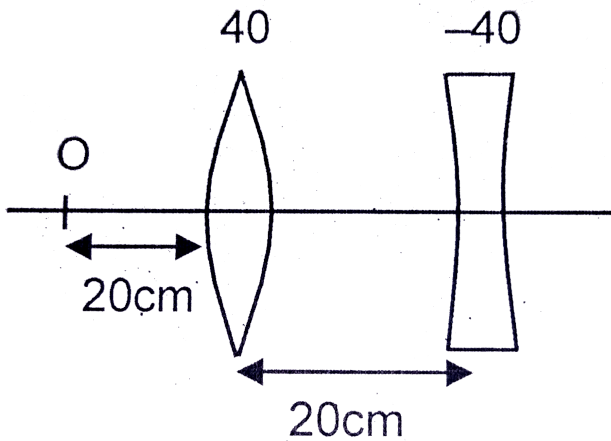
**Answer: D**



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18. Find the distance of image from convex lens.



- A. 24 cm
- B. 20 cm
- C. 4 cm

D. None of these

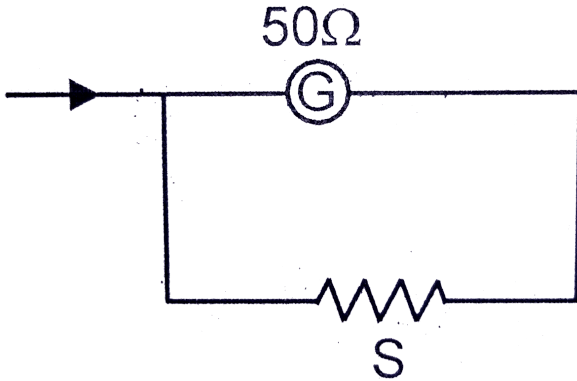
**Answer: C**



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**19.** Range of the ammeter is 5 ampere and full scale deflection current is  $0.5\mu A$ . If resistance of galvanometer is  $50\Omega$  then find shunt

resistance.



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20. Electric field inside the capacitor is  $100 \text{ V/m}$  and dielectric constant  $=5.5$ . What is the polarization ?

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21. An infinite large sheet has charge density  $\sigma \text{ C/m}^2$ . Find electric field at a distance  $d$  perpendicular to the sheet.

A.  $E = \frac{\sigma}{2\epsilon_0}$

B.  $E = \frac{\sigma}{\epsilon_0}$

C.  $E = \frac{2\sigma}{\epsilon_0}$

D. None of these

**Answer: A**



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**22.** A satellite which is revolving around earth has minimum distance from earth equal to  $r_1$  and maximum distance equal to  $r_2$  then time period of the satellite will be ?



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**23.** A particle performing SHM with angular frequency  $\omega = 5000$  radian/second and

amplitude  $A = 2$  cm and mass of 1 kg. Find the total energy of oscillation.

A. 2 kJ

B. 5 kJ

C. 7 kJ

D. 15 kJ

**Answer: B**



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24. A diatomic gas which has initial volume of 10 liter is isothermally compressed to  $1/15^{th}$  of its original volume where initial pressure is  $10^5$  Pascal. If temperature is  $27^\circ C$  then find the work done by gas

A.  $-2.71 \times 10^3 J$

B.  $2.70 \times 10^3 J$

C.  $-1.35 \times 10^3 J$

D.  $1.35 \times 10^3 J$

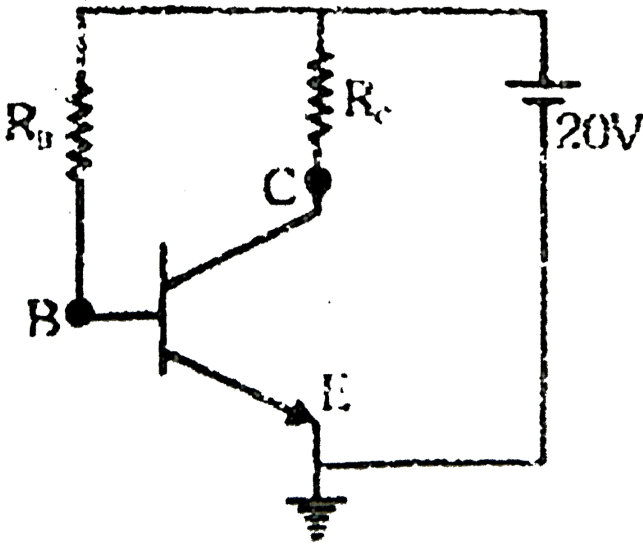
**Answer: A**



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25. For given CE biasing circuit, if voltage across collector-emitter is  $12V$  and current gain is 100 and base current is  $0.04 \text{ mA}$  then determine the value of collector resistance  $R_C$





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26. In a common emitter (CE) amplifier having a voltage gain  $G$ , the transistor used has

transconductor 0.03 mho and current gain 25.

If the above transistor is replaced with another one with transconductance 0.02 mho and current gain 20, the voltage gain will



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27. How many minimum NAND GATES are required for obtaining an output of  $A \text{gt } B + C$ .  
D?



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**28.** In a solenoid number of turns are  $N$  and a current  $I$  is passing through it. If diameter of the solenoid is  $D$ . find out the energy per unit length in the solenoid.



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**29.** Assertion: Linear momentum of a planet does not remain conserved.

Reason: Gravitational force acts on it.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**30.** Assertion: In throttling, temperature remains constant.

Reason: Throttling is isothermal.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: D**



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**31.** Assertion: Energy of an isolated particles system is constant.

Reason: Isolated system do not allow exchange of energy

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: D**



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**32.** Assertion: A satellite is orbiting around a planet then its angular momentum is conserved

Reason: Linear momentum conservation leads to angular momentum conservation.

A. If both assertion and reason are true and reason is the correct explanation of assertion.



B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: C**



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33.

Assertion:

$$\vec{E} = E_x \hat{i} + E_y \hat{j} + E_z \hat{k}, \vec{V} \times \vec{E} = 0$$

Reason  $E_x, E_y, E_z$  is independent.

- A. If both assertion and reason are true and reason is the correct explanation of assertion.
- B. If both assertion and reason are true but reason is not the correct explanation of assertion.
- C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**34.** Assertion : Electric field inside a conductor is 0.

Reason : Charge is present on surface of conductor.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**35. Assertion :** A string wave traveling towards a free end changes its direction of motion but phase

**Reason :** When string wave reaches the free end there is no medium present in front of it. remains constant after reflection.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**36.** Assertion : Magnetic field do not work on moving charge

Reason : Magnetic field do not provide acceleration to charge.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: C**



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**37.** Assertion : Heart can be assumed as electric dipole.

Reason : Its ELOF are just same like a normal dipole.



A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**38.** Assertion : When we jump from height then maximum possibilities to get hurt is at foot.

Reason : Maximum force is exerted on foot.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**39.** Assertion : Sky is maximum red in morning

Reason : Smallest wavelength scatter

maximum

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: A**



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**40.** Assertion : Bernoulli's theorem is applicable only on laminar flow.

Reason : Laminar flow is consider to be non viscous.

A. If both assertion and reason are true and reason is the correct explanation of assertion.

B. If both assertion and reason are true but reason is not the correct explanation of

assertion.

C. If assertion is true but reason is false.

D. If both assertion and reason are false.

**Answer: D**



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