

# MOCK-CET PHYSICS PAPER-1

1. Rotational kinetic energy of a body is given by the equation  $E = \frac{I\omega^2}{2}$  where  $I$  is moment of inertia and  $\omega$  angular velocity of the body. The dimensional formula of  $I$  using the above equation is  
1).  $ML^2T^0$       2).  $ML^2T^1$       3).  $M^2L^1T^1$       4).  $MLT$
2. If  $L$ ,  $C$  and  $R$  represent inductance, capacitance and resistance respectively, then which of the following does not have the dimension of the frequency?  
1).  $\frac{1}{RC}$       2).  $\frac{1}{\sqrt{LC}}$       3).  $\frac{C}{L}$       4).  $\frac{R}{L}$
3. A truck of mass 0.5 Ton is moving with a speed of  $6 \text{ ms}^{-1}$ . Sand is poured at the rate of 10 Kg per minute. How much force is needed to keep it moving with the same speed?  
1) 1N      2) 50N      3) 500 N      4) 3 N
4. A horizontal force  $F$  is applied on a block of weight  $W$  to hold against a vertical wall. The minimum value of force needed to hold the block if the coefficient of friction of the surface is  $\mu$   
1)  $\frac{W}{\mu}$       2)  $\frac{\mu}{W}$       3)  $\mu W$       4)  $W$
5. A bird is inside a wire cage hung from a spring balance. The spring balance reading is  $R_1$  when the bird is flying and  $R_2$  when it is at rest inside the cage. Which of the following is correct?  
1)  $R_1 \gg R_2$       2)  $R_1 > R_2$       3)  $R_1 < R_2$       4)  $R_1 = R_2$
6. An ideal heat engine gives out heat at  $77^\circ\text{C}$  to have a 30% of efficiency. The temperature of the source is  
1)  $269^\circ\text{C}$       2)  $773^\circ\text{C}$       3)  $673^\circ\text{C}$       4)  $227^\circ\text{C}$
7. In an auditorium absorption co-efficient of an open window is  
1) zero      2) infinity      3) unity      4) 0.5



**15.** The core of the transformer is laminated to avoid loss of energy due to

- 1) heating      2) hysteresis      3) eddy current      4) flux leakage

**16.** A binary full adder circuit consists of

- 1) two half adders  
2) two half adders and one AND gate  
3) two NAND gates  
4) two half adders and one OR gate

**17.** In a transistor emitter-base junction and collector-base junctions are respectively

- 1) forward and reverse biased      2) reverse and forward biased  
3) forward and forward biased      4) reverse and reverse biased

**18.** When both the source of sound and observer approach each other with a speed equal to half the velocity of sound, the change in frequency of sound as detected by the observer is

- 1) zero      2) 50%      3) 200%      4) 25%

**19.** Mass number  $A$  of a nucleus whose radius is 3.9 fermi is

- 1) 10      2) 39      3) 17      4) 27

**20.** A ball of mass 0.2 Kg falls under gravity from a height of 10 m with an initial velocity. It collides with the floor and loses 50% of its energy and then rises back to the same height. The value of its initial velocity is

- 1)  $14 \text{ ms}^{-1}$       2)  $7 \text{ ms}^{-1}$       3)  $24 \text{ ms}^{-1}$       4)  $2.5 \text{ ms}^{-1}$

**21.** An object is kept on the table. The angle between the action of the object on the table and the weight of the object is

- 1)  $270^\circ$       2)  $0^\circ$       3)  $90^\circ$       4)  $180^\circ$

**22.** Water rises up to a height 'h' in a capillary tube of certain diameter. When this is replaced by a tube of half the diameter, then water will rise to a height of

- 1) 3h                      2) 4h                      3) h                      4) 2h

**23.** In the pressure cooker the cooking is faster because of the increase of vapour pressure

- 1) increases latent heat                      2) decreases latent heat  
3) increases boiling point                      4) decreases boiling point

**24.** A water fall is 84 m high. Assuming that half of the kinetic energy of the falling water is converted into heat, the rise in temperature of water is (assume  $g = 10\text{ms}^{-2}$ )

- 1)  $0.1^\circ\text{C}$                       2)  $10^\circ\text{C}$                       3)  $0.2^\circ\text{C}$                       4)  $0.3^\circ\text{C}$

**25.**  $y = 0.5 \sin 2\pi(0.01x - 3t)$  represents a wave equation, where x & y are in meter and t in seconds. The speed of the wave in  $\text{ms}^{-1}$  is given by

- 1) 300                      2) 33.3                      3) 330.3                      4) 30

**26.** In simple harmonic motion the particle is

- 1) always accelerated                      3) alternately accelerated or retarded  
2) always retarded                      4) neither accelerated nor retarded

**27.** A ray of light undergoes a deviation of  $30^\circ$  when incident on an equilateral prism of refractive index  $\sqrt{2}$ . The angle made by the ray inside the prism with the base of the prism is

- 1)  $30^\circ$                       2)  $0^\circ$                       3)  $60^\circ$                       4)  $45^\circ$

**28.** Two lenses of power +12 and -2 dioptre are placed in contact. The effective focal length of the combination is

- 1) 0.1 m                      2) 0.125 m                      3) 0.083 m                      4) 0.166 m

**29.** Laser diode is

- 1) Forward biased p-n junction LED in which energy of the emitted photon is more than the energy gap
- 2) Forward biased p-n junction LED in which the energy of the emitted photon is equal to the energy gap
- 3) Reverse biased p-n junction LED in which the energy of the emitted photon is equal to the energy gap
- 4) Reverse biased p-n junction LED in which the energy of the emitted photon is more than the energy gap

**30.** A radio-active element has a decay constant of  $1.1 \times 10^{-9} \text{ s}^{-1}$ , then its half life in seconds is

- 1)  $0.63 \times 10^8$                   2)  $6.3 \times 10^8$                   3)  $6.3 \times 10^{-8}$                   4)  $5.5 \times 10^8$

**31.** The electrons emitted from nucleus during  $\beta^-$  decay originates from

- 1) inner orbit of atom
- 2) free electrons existing in nucleus
- 3) photon escaping from the nucleus
- 4) decay of a neutron in a nucleus.

**32.** A beam of light strikes a piece of glass at an angle of incidence  $60^\circ$ . The reflected beam is completely plane polarised. The refractive index of glass is

- 1)  $\sqrt{3}$                   2)  $\frac{\sqrt{3}}{2}$                   3)  $\frac{1}{\sqrt{3}}$                   4)  $\frac{3}{2}$

**33.** The transverse nature of light is shown by

- 1) interference                  2) diffraction                  3) refraction                  4) polarisation

**34.** In young's double slit experiment the separation between the slits is halved and the distance between the slit and the screen is doubled. The fringe width

- 1) decreases by one fourth
- 2) increases four times
- 3) doubled
- 4) halved

35. Which of the following phenomena cannot produce colours with white light?

- 1) dispersion  
2) interference  
3) diffraction  
4) polarisation

36. Electric lines of force about a positive point charge are

- 1) circular and clockwise  
2) circular and anti clockwise  
3) radially inwards  
4) radially out wards

37. A given charge is situated at a certain distance from an electric dipole in the end-on position experiences a force 'F'. If the distance of the charge is doubled the force acting on the charge will be

- 1) 2F  
2) F/2  
3) F/8  
4) F/4

38. In order to obtain a time constant of 10 seconds in an RC circuit containing a resistance of  $500\Omega$ , the capacity of the capacitor should be

- 1)  $2\mu F$   
2)  $5\mu F$   
3) 2mF  
4) 5mF

39. If  $n$ ,  $e$ ,  $\tau$ , &  $m$  represents electron density, charge, relaxation time and mass of the electron respectively then the resistance of the wire of length and area of cross section  $A$  is given by

- 1)  $\frac{2ml}{nA\tau e^2}$   
2)  $\frac{2m\tau A}{nle^2}$   
3)  $\frac{nA\tau e^2}{2ml}$   
4)  $\frac{nAe^2}{2ml\tau}$

40. A 50 V battery is connected across  $10\Omega$  resistor. If the current in the circuit is 4.5 A the net resistance of the battery is

- 1) zero  
2)  $0.5\Omega$   
3)  $1.1\Omega$   
4)  $5\Omega$

41. A magnetic dipole is placed in two perpendicular magnetic fields  $\vec{B}$  &  $\vec{B}_0$  is in equilibrium making an angle  $\theta$  with  $\vec{B}$ , then

- 1)  $B = B_0$   
2)  $B \cos \theta = B_0 \sin \theta$   
3)  $B = B_0 \tan \theta$   
4)  $B \sin \theta = B_0 \cos \theta$

42. A coil of 0.1 m X 0.1 m area having 50 turns is making 50 rps in a magnetic field of induction 2T. The peak value of induced emf is approximately
- 1) 110 V                  2) 220 V                  3) 314 V                  4) 628 V
43. A suspended coil galvanometer has 1000 number of turns, area  $3 \times 10^{-4} \text{ m}^2$  is kept in a magnetic field of strength one tesla is carrying a Current of one micro ampere. The deflecting couple is
- 1)  $6 \times 10^{-7} \text{ Nm}$                   2)  $6 \times 10^{-6} \text{ Nm}$                   3)  $3 \times 10^{-7} \text{ Nm}$                   4)  $3 \times 10^{-6}$
44. In a series L C R circuit the AC voltage across resistance is 5V, inductance 20 V and capacitance is 20 V. The AC voltage applied to the circuit is
- 1) 45 V                  2) 5 V                  3) 20 V                  4) 40 V
45. If the wave length of photon and proton are same then which of the Following property is same for the both
- 1) momentum                  2) energy                  3) frequency                  4) velocity
46. A generator produces a voltage that is given by  $V=240 \sin 38 \pi t$ , where Where t in seconds. The frequency and rms voltages respectively are
- 1) 38 Hz, 240 V                  2) 19 Hz, 240 V
- 3)  $38 \text{ Hz}, 120\sqrt{2} \text{ V}$                   4)  $19 \text{ Hz}, 120\sqrt{2} \text{ V}$
47. Two resistors have effective resistance of  $30\Omega$  when they are in series  $20/3$  when in parallel. Then the values of the resistors are
- 1) 25, 5                  2) 10, 20                  3) 18, 12                  4) 21, 9
48. A photo electron is accelerated through 3.2 V. The energy gained by it is
- 1) 3.2 e V                  2) 3.2 J                  3)  $3.2 \times 10^{-19} \text{ e V}$                   4)  $3.2 \times 10^{-19} \text{ J}$





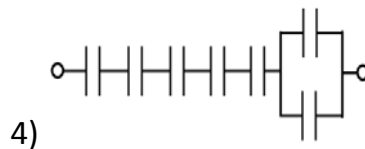
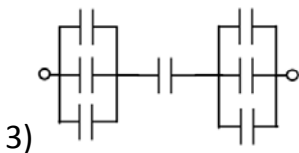
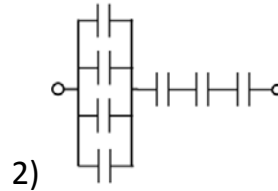
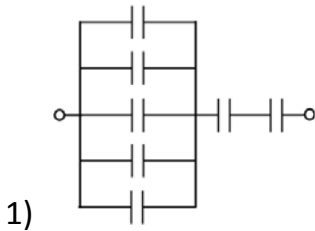
**55.** A rectangular board weighing 5 Kg is supported by two strings run from its Upper corners to a nail on the wall. If each string makes  $45^\circ$  angle with The vertical, the tension in each is

- 1)  $5/\sqrt{2}$                   2)  $10/\sqrt{2}$                   3)  $5\sqrt{2}$                   4)  $10\sqrt{2}$

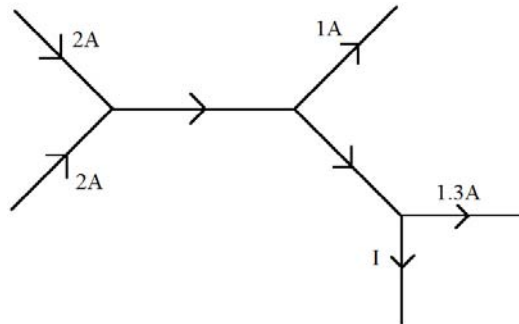
**56.** Which of the following materials may be used for manufacturing of Polaroids?

- 1) calcite    2) tourmaline  
 3) quinine iodo sulphate                                  4) quartz

**57.** Seven capacitors each of capacitance 2 micro farads are to be connected in a configuration to obtain a capacitance of  $(10/11)$  micro farad. Which of the following is correct?



58. The current in the following circuit is



- 1) 3.7 A      2) 1.7 A
- 3) 1.3 A      4) 1 A

59. If 10% of the main current is to be passed through the moving coil galvanometer of resistance 99 ohm then the required shunt resistance is

- 1) 9.9  $\Omega$                       2) 10  $\Omega$                       3) 11  $\Omega$                       4) 9  $\Omega$

60. 100 gram of ice is mixed with 100 gram of water at 100<sup>0</sup> C . The final temperature of the mixture is

- 1) 30<sup>0</sup> C                      2) 40<sup>0</sup> C                      3) 20<sup>0</sup> C                      4) 10<sup>0</sup> C

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