Physics

1.Which of the following is not an electro magnetic wave
a)   x-rays   b)   alpha-rays   c)   gamma-rays   d)   light rays

2.Electro magnetic waves of wave length ranging from 100Åto 4000Å come under
a)   x-rays   b)   UV region   c)   visible region   d)   infra-red region

3.Electro magnetic theory suggests that the light consists of
a)   magnetic vector alone   b)   electric vector alone   c)   electric and magnetic vectors perpendicular to each other.   d)   parallel electric and magnetic vector

4.The frequency of radio waves corresponding to a wave length of 10 m is
a)   3×107Hz   b)   3.3×108Hz   c)   3×109Hz   d)   3×10−7Hz

5.The electromagnetic waves travel with velocity of
a)   sound   b)   light   c)   greater than that of light d)   greater than that of sound

6.The existence of EM waves were experimentally confirmed by
a)   Maxwell   b)   Faraday   c)   Hertz   d)   Tesla

7.The back emf in a DC motor is maximum when
a)   the motor has picked up maximum speed   b)   the motor has just started moving   c)   the speed of motor is still on increase   d)   the motor has just been switched off

8.AC measuring instrument measures
a)   peak value   b)   rms value   c)   any value   d)   average value

9.The Q-factor of a resonant circuit is equal to
a)   1CWR   b)   1WL   c)   CWR   d)   fCW

10.In a step-down transformer, the number of turns in
a)   Primary are less   b)   Primary are more   c)   Primary and secondary equal   d)   secondary are infinite

11.In AC circuits choke is preferred to resistors because
a)   choke coil is cheap   b)   voltage increases   c)   energy is not wasted   d)   current increases

12.A choke is used as resistance in
a)   AC circuits   b)   DC circuits   c)   half-wave rectifier circuits d)   both AC and DC circuits

13.The frequency of AC mains in India is
a)   110 C/S   b)   50 C/S c)   60 C/S d)   120 C/S

14.A transformer works on
a)   DC only b)   AC only c)   both AC and DC   d)   high voltage only

15.Alternating voltage
a)   is independent of time   b)   varies directly with time c)   varies inversely with time   d)   varies sinusoidaly with time

16.The law of electromagnetic induction have been used in the construction of
a)   electric operator b)   electric motor   c)   galvanomet   d)   none of the above

17.Power consumed in an AC circuit become zero if
a)   inductance and resistance are both high b)   inductance and resistance are both low   c)   inductance very high and resistance negligible   d)   inductance low and resistance high

18. The rms value of current (Irms) is
a)   b/2   b)   2Io   c)   ω   d)   2I0

19. In a purely inductive circuit the current
a)   is in phase with the voltage   b)   is out of phase with the voltage   c)   eads the voltage by 900 d)   lags behind the voltage by 900

20. A lamp is connected in a series with a capacitor and an ac source, what happens if the capacity of the capacitor is reduced?
a)   the lamp shines more brightly   b)   the lamp shines less brightly   c)   there is no change in the brightness of the lamp   d)   brightness may increase or decrease depending on the frequency of ac

21. A transformer is a device which converts
a)   low voltage low current into high voltage high current   b)   high voltage low current into low voltage high current   c)   high voltage high current into low voltage low current   d)   electric power into mechanical power

22. The resonant frequency of an LC circuit is
a)   1/2πLC b)   12πLC   c)   12πL/C d)   12πC/L

23. If the conductance and capacitance are both doubled in LCR circuit, the resonant frequency of the circuit will
a)   decrease to one half the original value   b)   decrease to one-forth the original value   c)   increase to twice the original value   d)   decrease to twice the original value

24. The power factor in an LCR circuit at resonance is
a)   zero   b)   1   c)   0.8   d)   1/2

25. The power factor in a circuit is unity. Then the impedance of the circuit is
a)   inductive   b)   capertive   c)   partially inductive and partially conductive   d)   resistive

26. One complete set of negative and positive values of alternating quantities is called
a)   time period   b)   amplitude   c)   frequency   d)   cycle

27. The instantaneous value of an ac is given by $1=5\sin(wt+\varphi)$. The rms value of current is
a)   SA   b)   2×SA   c)   S/2A d)   2.5A

28. Inductive reactance of a coil expressed as
a)   Ampere b)   ohm   c)   volt   d)   weber

29. The average value of alternating current over a complete cycle is
a)   zero   b)   1 rms   c)   i/2   d)   i/2

30. A induction may store energy in
a)   Its electric field   b)   Its coils c)   Its magnetic field   d)   Both electric and magnetic fields

31. Two different coils have self inductance 8mH and 2mH. The current in both coils are increased at same constant rate. The ratio of the induced emfs in the coil is
a)   4:1   b)   1:4   c)   1:2   d)   2:1

32. A coil of resistance 5Ω and inductance 4H is connected to a 10V battery. The energy stored in the coil
a)   0.8J   b)   8J   c)   16J   d)   4J

33. Two coils of self inductance L1 and L2 are placed close together so that effective flux in one coil is completely linked with the other. If m is the mutual inductance between them, then
a)   M=L1L2   b)   L1L22   c)   M=(L1+L2)2   d)   M=L1L2

34. The instrument which works on the principle of mutual induction is
a)   galvanometer   b)   ammeter   c)   potentiometer   d)   transformer

35. What is the self inductance of a coil in which an induced emf of 2V is set up when the current is charged at the rate of $4AS^{-1}$
a)   0.5mH   b)   0.05H   c)   2H   d)   0.5H

36. Lenz's Law is a consequence of law of conservation of
a)   energy only   b)   charge only   c)   momentum only d)   energy and momentum

37.Two blocks A (20kg) lying on a frictionless table are connected by a light string. The system is pulled horizontally with an acceleration of 2m/s2by a force F on B. The tension in the string is
a) 10N   b) 40N   c) 100N   d) 120N

38.A body of mass 2kg collides with a wall with a speed of 100 m/s and rebounds with the same speed. If the time of contact is 150s, the force exerted on the wall is
a) 8N   b) 2×10^4N   c) 4N   d) 10^4N

39.The mechanical advantage of a system of pulley s is four. The force needed to lift a mass of 100 kg will be
a) 20kg. Wt   b) 25kg. Wt   c) 5kg. Wt   d) 15kg. Wt

40.The distance x covered in time t by a body having initial velocity u and having constant acceleration a is given by $x=ut+\frac{1}{2}at^2$. This result follows from
a) Newton's First Law   b) Newton's Second Law   c) Newton's Third Law   d) None of the above

41.A plumb bob is hanging from the ceiling of a car. If the car moves with the acceleration 'a' the angle made by the string with the vertical is
a) $\sin^{-1}(\frac{a}{g})$ b) $\sin^{-1}(\frac{g}{a})$ c) $\tan^{-1}(\frac{a}{g})$ d) $\tan^{-1}(\frac{g}{a})$

42.A weight W can be just supported on a rough inclined plane by a force F either acting along the plane or horizontally. If θ is the angle of friction, then F/W is
a) tan θ   b) sec θ   c) sin θ   d) cos θ

43.A 1000 kg lift is supported by a cable that can support 2000kg. The shortest distance in which the lift can be supported when it is descending with a speed of 2.5 m/s is (g=10m/s2)
a) 5/16m   b) 5/32 m   c) 1m   d) 2m

44.A body is projected up a 450rough incline. The coefficient of friction is 0.5. Then the retardation of the block is
a) $\frac{g}{2\sqrt2}$ b) $\frac{g}{\sqrt2}$ c) $\frac{3g}{2\sqrt2}$ d) $\frac{g}{\sqrt2}$

45.A body takes n times as much time to slide down as 450rough incline as it takes to slide down a smooth 450incline. The coefficient of friction is
a) $1-\frac{1}{n^2}$ b) $\frac{1}{1-n^2}$ c) $\sqrt{1-\frac{1}{n^2}}$ d) $\sqrt{\frac{1}{1-n^2}}$

46.A ball of mass m is thrown upward with a velocity v. If air exerts an average resisting force F, the velocity with which the ball returns back to the thrower is
a) $v\sqrt{\frac{mg}{mg+F}}$ b) $v\sqrt{\frac{F}{mg+F}}$ c) $v\sqrt{\frac{mg-F}{mg+F}}$ d) $v\sqrt{\frac{mg+F}{mg-F}}$

47.A ball of mass 0.1kg strikes a wall normally with a speed of 30 m/s and rebounds with a speed of 20m/s. The impulse of the force exerted by the wall on the ball is
a) 1N-S   b) 5N-S   c) 2N-S   d) 3N-S

48.A body kept on a smooth inclined plane having inclination 1 in x will remain stationary relative to the inclined plane if the plane is given a horizontal acceleration equal to
a) $\frac{g}{\sqrt{x^2-1}}$ b) $\frac{g}{x\sqrt{x^2-1}}$ c) $\frac{\sqrt{x^2-1}}{g}$ d) $\frac{\sqrt{x^3-1}}{gx}$

49.The minimum acceleration with which a fireman can slide down a rope of breaking strength two-third of his weight is
a) zero   b) g/3   c) 3g   d) g

50.An elevator is moving vertically up with an acceleration 'a'. The force exerted on the floor by a passenger of mass m is
a) mg   b) ma   c) mg-ma   d) mg+ma