Paper Code - 3022

B.Sc. Sem – I (Old Course)

JULY-SEP – 2021

Physics-101

કુલ સમય :– ૬૦ મીનીટ કુલ પ્રશ્નો : ૫૦ વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૩૫

નોંધ : વિદ્યાર્થીએ માત્ર ૩૫ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૩૫ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

1. If $\vec{A}$ and $\vec{B}$ perpendicular to each other in $\vec{A}\ x\ (\ \vec{B} x\ \vec{C})$,_then $\overrightarrow{A}$ x ($\vec{B}$ x $\vec{C}$) _____

(a) Is perpendicular to $\overrightarrow{B}$ (b) Is perpendicular to $\vec{C}$ (c) Is parallel to $\overrightarrow{B}$ (d) Is parallel to parallel to $\vec{C}$

2. The resulting vector of $\overrightarrow{A}$ x ($\vec{B}$ x $\vec{C}$) _____

(a) Is perpendicular to $\vec{A}$ but also parallel to $\vec{C}$ (b) Is perpendicular to all three.

(c) Has no fixed direction. (d) All the above statements are false.

3. For unit vectors $\hat{\imath}, \hat{\jmath}\ and\ \hat{k}, \hat{\imath}\ x\ (\hat{\jmath}\ x\ \hat{k})$ = _____

(a) 1 (b) Infinite (c) cannot be defined. (d) Zero

4. The position vector of a particle varies with time, according to the vector formula (2, 3t, $4t^2$). So, in t = 1 second, Its acceleration will be _____ (Here $\hat{\imath}, \hat{\jmath}\ and\ \hat{k}$ is a unit vector.)

(b) Zero (b) 8 $\hat{k}$ m / s^2 (c) 13 $\hat{\jmath}$ m / s^2 (d) 5$\hat{k}$m / s^2

5. Which of the following field is a scalar field?

(a) Distribution of temperature in the room (b) Distribution of electric field in the room

(c) Divergence of water flux (d) curlof water flux

6.If the curl of a vector field is zero, then this field _____

(a) will change with speed. (b) called rotational

(c) There will be a magnetic field. (d) None of the above.

7. In Gauss's diversion theorem, field _____

a) Relates line Integration with volume Integration.

(b) Relates line Integration of diversion with volume Integration of field.

(c) Relates volume Integration of diversion with surface Integration of field. (d) None of the above.

8. Stokes theorem relates with _____

(a) Line integration of diversion and volume Integration of field. (b) Surfaceintegration of curl and line Integration of field.

(c) Line integration of curl and surface integration of field. (d) Line and surface integration of the field.

9. Log Decrement means _____

(a)Rate of change in increase in amplitude. (b) Rate of logarithm amplitude decreasing with time.

(c) Suddenly decrease of amplitude (d) logarithm of damping oscillations.

10. In damping oscillation, log decrement is given by _____ equation? (R is coefficient of damping.)

(a)$-\frac{R}{2m}$ (b)$\frac{R}{2m}$ (c) $-\frac{RT}{2m}$ (d) $\frac{R}{2m}$

11. Oscillation of Dead beat of galvanometer _____

(a)There is a simple periodic oscillation. (b) There is an over-damp oscillation.

(c) There is a very slow oscillation. (d) Are extremely fast.

12. Two S.H.M. having same angular frequency (ϕ) and same direction , Resultant angular frequency of combination of S.H.M. _____

(a) 2 ϕ (b) $\frac{\phi}{2}$ (c) ϕ^2 (d) ϕ

13. .A two S.H.M. having same frequency and same amplitude and phase difference $\frac{\Pi}{2}$ perpendicular toeach other,then resultant trejectory of oscillating particle is _____

(a)line. (b)circle. (c)elliptical (d)zig- zag.

14. . A oscillating particle with same frequency different amplitude and with phase difference $\frac{\Pi}{2}$ perpendicular to each other ,then trejectory of oscillating particle is _____

(a)line. (b)circle. (c)elliptical (d) None of the above.

15. In L - R,time constant is given by _____?

(a) RL (b)$\frac{L}{R}$ (c) $\frac{R}{L}$ (d)$\frac{Rt}{L}$

16.In L - R D.C. circuit , when electric current become maximum ,then what happens to dissipative energy from battery ?
(a) Do not dissipatived . (b) I_0^2R Joule energy used.
(c) Energy stored in the foam of magnetic field in inductor. (d) None of the above.

17. A L - R D.C. circuit contains resistances of 10 ohm. If the time constant of this circuit is 1 second then value of the inductance of the inductor is _____
(b) 10 H (b) 10 mH (c) 1 H (d) 1 mH

18. In L - R D.C. circuit , The sum of increasing current and decreasing current"s equations in the circuit is _____. Here ,Take the same amount of time.
(b) I_0 (b) 1 (c) $2I_0$ (d)None of the above.

19. L = 4 H , R = 100 Ohm and 10 Vbattery connected in series in L-R D.C. circuit. If at t = 0 switch is on , then maximum current _____ ?
(b) 10 A (b) 0.1 A (c)2.5 A (d)None of the above.

20. In R - C D.C. circuit, During the charging of capacitor, when capacitor is fully charge then electric current flows in circuit _____ ?
(b) $I_0 = \frac{\varepsilon}{R}$ (b)$I_0 = \frac{C}{R}$ (c) $I_0 = 0$ (d)I_0 =Infinity

21. In L - C circuit ,A electric charge on capacitor is periodically changes, so electromagnetic wave produced. Then frequency of Electromagnetic waves will be _____?
(b) $\frac{1}{LC}$ (b)$\frac{1}{\sqrt{LC}}$ (c)$\frac{1}{2\Pi\sqrt{LC}}$ (d) None of the above.

22. In L – C D.C. circuit, Differential equation is $d^2Q / dt^2 = - \varphi^2 Q$. According to classical mechanic ,this equation is of _____
(a)Differential equation of S.H.M.. (b) The equation of particle having acceleration along - X axis direction.
(c)Constant acceleration motion of the particle. (d) None of the above

23. .In L – C D.C. circuit, Differential equation is $d^2Q / dt^2 = - \varphi^2 Q$ in electric field ,Which physical quantity is equvivalent to particle mass in abouve equation ?
(b) Electric current (b) Electrical charge (c)Inductance (d) Capacitance

24.. What is the main purpose of studying L - C - R D.C. circuit?
(a)To know that ,how the capacitance of a capacitor changes over time.
(b) To know that , how electromagnetic energy is emitted over time.
(c) To know that ,whether,in this circuit ,A.C. current got it or not. (d) None of the above.

25. In L - C- R D.C. circuit, when $(R^2 / 4L^2) = (1 / LC)$. then the Electric charge of the capacitor _____
(b) Speedly becomes maximum. (b) Gradually becoming maximum.
(c) The particle oscillates so longthen is becomes zero. (d) None of the above.

26. L - C - R D.C. circuit,When the current is oscillating at that time _____
(a)Electric current is A.C. (b) At some time current become zero.
(c) Both of the above (d) None of the above

27. Thevenin and Norton theorems are used for _____
(a)For all frequencies (b) For certain frequence only
(c) Is equivalent to only one frequence which is calculated. (d) None of the above.

28. Does, Thevenin's theorem convert a two-terminal network to _____?
(a) A voltage source and an impedance in series with it.
(b) An impedance in parallel with a voltage source.
(c) Circuits that are in two impedance series and the voltage source has been removed.
(d) None of the above.

29. In Refrigerator, The workcoefficent is 5And work on the system is 50 joule, then quantity of thermal energy absorbed _____calorie ?
(b) 50 (b) 100 (c) 250 (d) 300

30. Refrigerator is a _____ of Carnot cycle.
(a) Reserve (b) Two time reverse and once forward (c) Many times (d) None of the above

31. In the first stage of the refrigerator, air is compressed in the isotope process. During this process _____
(a)No external energy is required. (b) The air itself works. (c) Requires external energy. (d) No work is done.
32. In the case of a refrigerator, the work done is _____
(a)$Q_1 - Q_2$ (b) $Q_1 + Q_2$ (c)$\frac{Q1-Q2}{Q2}$ (d)None of the above
33. " Of the heat engines operating between any two fixed temperatures, only the reverseable heat engine, Efficiency is the highest." This statement is called _____?
(a)Carnot engine (b) Thermodynamic engine (c) Both of the above (d) None of the above
34. In the refrigerator, the work done is zero then the perfomence coefficient β = _____
(a) Zero (b) Infinitely. (c)Imaginary value. (d) Hybrid number.
35. In a commonrefrigerator , the perfomence coefficient is of the order of _____?
(a)6 To 12 (b) 0 To 2 (c)2 To 6 (d) None of the above
36. The efficiency of the Carnot engine depends only on its source and sink temperature, respectively Θ_1 and Θ_2. Using this fact, we obtain the temperature scale.which is called _____.
(b) Kelvin scale (b) Clociue scale (c) Carnot scale. (d) None of the above
37. The advantage of thermodynamic temperature measurement is that, it _____
(a)Is independent of the properties of the working substance.
(b) Depends on the properties of the working substance.
(c) Depends only linearly on the properties of the working substance. (d) None of the above
38. The triple point of water on the thermodynamic scale of Kelvin is taken to be _____?
(a)0 K (b) 273 K (c)273.16 K (d)273.16 C
39. The output peak voltage in Bridge-Rectifier is _____?
(a) $4V_m$ (b) V_m (c) $2V_m$ (d) $8V_m$
40.In a half-wave rectifier,I_{rms}= _____
(a) 0.5 I_m (b) 1.41 I_m (c) 0.707 I_m (d) None of the above.
41. In the bridge-rectifier,I_{rms} = _____
(a) 0.5 I_m (b) 1.41 I_m (c) 0.707 I_m (d) None of the above.
42. In a full wave rectifier, D.C.current I_{dc} = _____
(a) $I_m/\sqrt{\Pi}$ (b)2 I_m / Π (c) 0.707 I_m (d) None of the above.
43. In the case of a full wave rectifier with aL - C filter, the ripple factor is _____.
(a) Propational to R_L. (b) Propational to LC (c) Inversely proportions to LC. (d) Inversely proportions to $\sqrt{LC}$.
44.Load line draw on the _____ characteristic of the transistor?
(a) Input (b) Output (c) Both of the above (d) None of the above.
45. In transistor amplifier, To establish a Q – point on load line _____ circuit is used.
(a) Input (b) Output (c) Both of the above (d) None of the above.
.46. In a common base transistor circuit,To obtain out put characteristics_____graph is used.
(a) $I_E \longrightarrow I_C$ (V_{CC} = constant) (b) $I_C \longrightarrow V_{BE}$ (I_B constant) (c) $I_C \longrightarrow V_{CB}$ (I_E constant) (d) None of the above.
47. . In a common emitter transistor circuit,To obtain out put characteristics_____graph is used.
(a) $I_C \longrightarrow V_{CC}$ (I_C = constant) (b) $I_C \longrightarrow V_{CE}$ (I_B constant) (c) $I_C \longrightarrow V_{CB}$ (IE constant) (d) None of the above.
48. When we change the input signal in the transistor amplifier circuit, then _____
(a) The slope of the load line changes. (b) The load line gets smaller-larger.
(c) On the load line, The location of the Q - point changes. (d) None of the above.
49. Efficiency of bridge rectifier is_____
(a)Double than the efficiency of full wave rectifier contain two diodes.. (b) Is equal to the efficiency of a half-wave rectifier.
(c) Double than the efficiency of half wave rectifier. (d) None of the above.
50. DC current in a half wave rectifierI_{dc}= _____
(a) $I_m/\sqrt{\Pi}$ (b) I_m / Π (c) 0.707 I_m (d) None of the above.