COMMON SECOND REVISION TEST – 2023

Standard XII Reg.No. :
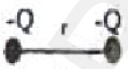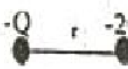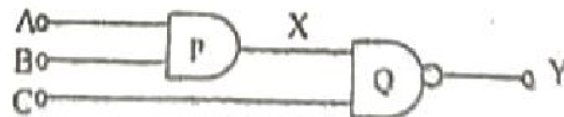
PHYSICS

Time: 3.00 hrs. Part - I Marks: 70

I. Choose the correct answer: 15 x 1 = 15

1. If a coil of 800 turns is placed perpendicular to the magnetic field of 5×10^5 T, if the coil is rotated by 90° in 0.1S, what is the induced emf if the area enclosed by the coil is 0.05 m²?
   a) 2V b) 0.2V c) 0.002V d) 0.02V

2. Which of the following colours has maximum speed?
   a) Violet b) Red c) Green d) all have same speed

3. Rainbow is produced due to by water drops
   a) dispersion b) partial polarisation
   c) complete polarisation d) interference

4. Strongest sources of gravitational waves are
   a) black holes b) accelerated masses
   c) god particles d) all the above

5. Electric potential at infinity is
   a) infinity b) maximum c) minimum d) 0

6. γ rays are used for the treatment of
   a) cancer b) Polio c) AIDS d) TB

7. The dimensional formula for resistance is
   a) $ML^2T^{-3}2A^{-2}$ b) $ML^2T^{-1}A^{-1}$ c) $ML^2T^{-2}A^{-3}$ d) $ML^2T^{-1}A^{-2}$

8. The number of images formed by two parallel plane mirrors are
   a) ∞ b) 0 c) 3 d) 8

9. Rank the electro static potential energies for the given system of charges in increasing order

   a) 1 = 4 < 2 < 3 b) 3 < 1 < 2 < 4 c) 2 = 4 < 3 < 1 d) 2 = 3 < 1 < 4

10. Blue color LEDs are manufactured using
    a) SIC b) AlGap c) GnAsP d) GaInN

11. Find out the output of the following circuit if the three inputs A, B, C are all zero

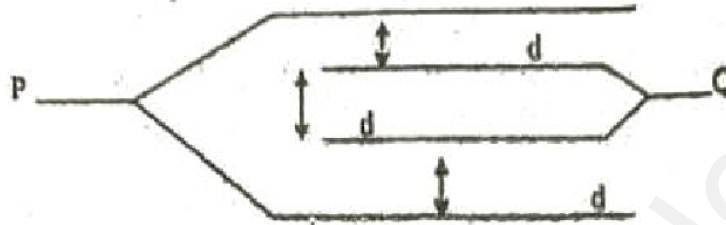   a) 0 b) 1
    c) 10 d) 11

12. If the kinetic energy of an electron is 2 eV then its momentum is
    a) 7.63×10^{-25} kg ms⁻¹ b) 7.63×10^{-24} kg ms⁻¹
    c) 6.63×10^{-25} kg ms⁻¹ d) 6.63×10^{-24} kg ms⁻¹

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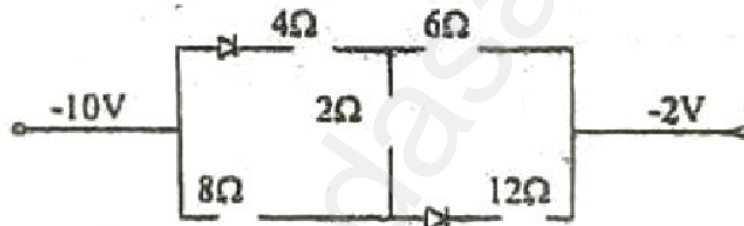(2)   XII Physics

13. If the area of the all four plates is equal to A and the distance of separation is 'd', the equivalent capacitance between P and Q is

a) $\dfrac{A\varepsilon_0}{d}$ b) $\dfrac{A\varepsilon_0}{2d}$ d) $\dfrac{2A\varepsilon_0}{d}$ d) $\dfrac{3A\varepsilon_0}{d}$

14. If the photo electric work function of a metal surface is 2.063 eV its threshold frequency is

a) $4125\,\overset{\circ}{A}$ b) $3750\,\overset{\circ}{A}$ c) $6000\,\overset{\circ}{A}$ d) $2062.5\,\overset{\circ}{A}$

15. The equivalent resistance between A and B in the following circuit is

a) $\dfrac{20}{3}\,\Omega$ b) $10\,\Omega$ c) $16\,\Omega$ d) $20\,\Omega$

Part - II

II. Answer any 6 questions. (Q.No.24 is compulsory)   6 x 2 = 12

16. Why steel is preferred for making rabots?
17. If the refractive index of glass is 1.5, what is the angle of polarisation?
18. Differentiate mobility and drift velocity.
19. Define electric potential.
20. Define threshold frequency.
21. State Ampere's circuital law.
22. Why the sky appears blue?
23. Write any two uses of infrared rays.
24. An ideal transformer has 460 and 40,000 turns in the primary and secondary coils respectively. If the transformer is connected to 230V AC mains, find the voltage developed per turn of the secondary.

Part - III

III. Answer any 6 questions. (Q.No.33 is compulsory)   6 x 3 = 18

25. State Kirchoff's current and voltage laws.

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26. Write the conditions for total internal reflection.
27. What are the properties of cathode ray?
28. Derive an expression for energy stored inside a parallel plate capacitor.
29. Distinguish between interference and diffraction.
30. If inductance, capacitance and resistance, values of an RLC circuit are 500mH,

$\frac{80}{\pi^2}$ pF and 628 Ω. Calculate the resonant frequency and Q factor of the circuit.

31. List the characteristics of Lorentz force.
32. Why electrons are preferred in microscope instead of X-rays?
33. In a common base configuration of a transistor if $\alpha = 0.95$ and $I_e T = 1$ mA, find out the values of I_c and I_a

Part - IV

IV. Answer all the questions.   5 x 5 = 25

34. a) Derive an expression for magnetic field at a point due to infinitely long straight current carrying conductor

(OR)

   b) Derive the exponential law of disintegration.

35. a) What is absorption spectrum? Explain the types of absorption spectrum.

(OR)

   b) Explain the working of electron microscope with neat sketch.

36. a) Explain diffraction at single slit and obtain the condition for nth minimum.

(OR)

   b) Derive an expression for the average power of an AC circuit. Explain the special cases.

37. a) Derive the expression for Lens maker's formula and deduce lens formula from it.

(OR)

   b) Explain with circuit diagram the function of a transistor as an amplifier.

38. a) State Gauss law, Derive the equation for electric field at a point due to infinitely long charged conductor.

(OR)

   b) Explain how the emf's of two given cells are compared using potentiometer.

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