Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

1.

1. Which of the following electromagnetic waves have the shortest wavelength?
   - (A) radio waves
   - (B) infrared waves
   - (C) ultraviolet waves
   - (D) micro waves

2. Automatic function of street lights can be done by _____ .
   - (A) inductor
   - (B) comparator
   - (C) transistor
   - (D) capacitor

3. A two input NAND gate with input 'A' and 'B' has output zero if _____ .
   - (A) B is zero
   - (B) A is zero
   - (C) both A and B inputs are zero
   - (D) both inputs A and B are one

4. The shortest wavelength in Lyman series is _____ .
   - (A) $\frac{2}{3}R_H$
   - (B) $\frac{4}{9}R_H$
   - (C) $\frac{1}{R_H}$
   - (D) R_H

5. The potential difference between two plates is 100 volts and separation of the plates 5 cm then potential gradient is _____ .
   - (A) $2000 \, NC^{-1}$
   - (B) $20 \, NC^{-1}$
   - (C) $5000 \, NC^{-1}$
   - (D) $2 \, NC^{-1}$

6. If the temperature of the black body is doubled then energy radiated per second per unit area becomes.
   - (A) 32 times
   - (B) 16 times
   - (C) 64 times
   - (D) 4 times

7. In radiation therapy, the thyroid cancer treatment is done with _____ .
   - (A) sodium – 24
   - (B) iodine – 131
   - (C) carbon – 14
   - (D) cobalt – 60

8. A direct current of 5 ampere is given to primary coil, then the voltage developed across secondary coil is _____ .
   - (A) 5 volts
   - (B) zero
   - (C) 10 volts
   - (D) 2 volts

9. A battery moves a charge of 400 C in a circuit in time 50 seconds. The current will be _____ .
   - (A) 2 A
   - (B) 8 A
   - (C) 20 A
   - (D) 200 A

10. Which of the following is not needed in fast nuclear reactor?
    - (A) moderator
    - (B) control rods
    - (C) turbine
    - (D) heat exchanger

11. Which of the following is not present in A.C generator?
    - (A) split rings
    - (B) carbon brushes
    - (C) magnetic field
    - (D) armature

12. Which of the following is not accurate measuring device?
    - (A) digital multimeter
    - (B) cathode rays oscilloscope
    - (C) voltmeter
    - (D) potentiometer

13. A one farad capacitor is charged to 100 V and then discharge through $1 \, K\Omega$ resistance the total energy dissipated through resistor is _____ .
    - (A) 5 KJ
    - (B) 10 KJ
    - (C) 2 KJ
    - (D) 100 KJ

14. The length contraction happens only _____ .
    - (A) perpendicular to direction of motion
    - (B) along the direction of motion
    - (C) opposite to direction of motion
    - (D) along any direction

15. In RLC series circuit, at resonance frequency, the impedance is _____ .
    - (A) zero
    - (B) minimum
    - (C) maximum
    - (D) infinite

16. Which one of the following is not semiconductor?
    - (A) germanium
    - (B) silicon
    - (C) aluminium
    - (D) gallium arsenide

17. The magnetic force on an electron moving with speed 10^6 m/sec perpendicular to the magnetic field of strength 1 web m^{-2} is _____ .
    - (A) 1.6×10^{-19} N
    - (B) 1.6×10^{-13} N
    - (C) zero
    - (D) 1.6×10^{-23} N

PHYSICS   (Intermediate Part-II , Class 12th) 422 - (II)   Paper II   (Group – I)

Time: 20 Minutes   <u>OBJECTIVE</u> ..... <u>Code: 8473</u> قیس گی۔22   Marks: 17

Note: You have four choices for each objective type question as A, B, C and D. The choice which you think is correct, fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question. Attempt as many questions as given in objective type question paper and leave others blank.

1. 1. To construct a step down transformer _____ .
   (A) $N_S > N_P$ (B) $N_S = N_P$ (C) $N_S < N_P$ (D) $N_S = 10\,N_P$

   2. The inputs of NAND gate are '1' and '0' . Its output will be _____ .
   (A) 0   (B) 2   (C) 0.5   (D) 1

   3. SI unit of current amplification factor ' β ' is _____ .
   (A) ampere   (B) AS^{-1} (C) no unit   (D) CS^{-1}

   4. Lyman series lies in the _____ .
   (A) ultraviolet region   (B) visible region   (C) infrared region   (D) far-infrared region

   5. Practical application of electrostatic force is in _____ .
   (A) laser   (B) x-ray production   (C) inkjet printer   (D) A.C generator

   6. Which of the following has the greatest frequency?
   (A) radio wave   (B) gamma-ray   (C) x-ray   (D) red light

   7. Two down and one up quark make _____ .
   (A) neutron   (B) photon   (C) positron   (D) proton

   8. The unit of magnetic flux density is _____ .
   (A) $Wb\,m^{-2}$ (B) $Nm^{-1}A^{-1}$ (C) tesla   (D) all of these

   9. Magnitude of drift velocity is of the order of _____ .
   (A) $10^{-6}mS^{-1}$ (B) $10^{6}mS^{-1}$ (C) $10^{3}mS^{-1}$ (D) $10^{-3}mS^{-1}$

   10. The half life of radon gas is _____ .
   (A) 4.5×10^{9} years   (B) 30.1 years   (C) 3.8 days   (D) 23.5 minutes

   11. The device which allows only the continuous flow of A.C through it is _____ .
   (A) capacitor   (B) inductor   (C) thermistor   (D) all of these

   12. A cell is used in _____ .
   (A) ohmmeter   (B) ammeter   (C) galvanometer   (D) voltmeter

   13. A charge of four coulombs is in the electric field intensity of $4\,N/C$. The force on the charge is _____ .
   (A) 8 N   (B) 16 N   (C) 1 N   (D) zero

   14. Which one is low energy photon?
   (A) x-ray   (B) infrared light   (C) ultraviolet light   (D) visible light

   15. The peak value of A.C source is 20 A, then its rms value will be _____ .
   (A) 10 A   (B) 14.1 A   (C) 20 A   (D) 28.2 A

   16. If a body regains completely its altered shape and size , it is said to be _____ .
   (A) plastic   (B) brittle   (C) elastic   (D) all of these

   17. The magnetic field of solenoid is quite similar to that of _____ .
   (A) straight conductor   (B) single wire loop   (C) a bar magnet   (D) all of these

Note: Section I is compulsory. Attempt any THREE (3) questions from Section II.

SECTION – I

2. Write short answers to any EIGHT questions.   (2 x 8 = 16)

i. Define electron volt (ev). Show that 1 ev = 1.6×10^{-19} J.

ii. Show that $\dfrac{1 \text{ volt}}{1 \text{ meter}} = \dfrac{1 \text{ newton}}{1 \text{ coulomb}}$.

iii. Is $\vec{E}$ necessarily zero inside a charged rubber balloon, if balloon is spherical? Assume that charge is uniformly distributed over the surface.

iv. Prove that ohm x farad = second.

v. How can a galvanometer is made more sensitive? Explain briefly.

vi. Suppose that a charge q is moving in a uniform magnetic field with a velocity v. Why is there no work done by magnetic force that acts on charge q?

vii. Draw a circuit diagram of current measuring part of avometer.

viii. Is it possible to orient a current loop in a uniform magnetic field such that the loop will not tend to rotate? Explain.

ix. What do you understand by back ground radiations? State any two sources of radiation.

x. How can radioactivity help in the treatment of cancer?

xi. Differentiate between mass defect and binding energy.

xii. Define nuclear fission and nuclear fusion.

3. Write short answers to any EIGHT questions.   (2 x 8 = 16)

i. Describe a circuit which will give a continuously varying potential.

ii. A wire of length 10 m has resistance 100 Ω. If the wire is stretched to increase its length three times. What will be its new resistance?

iii. What is meant by an electromotive force (emf)? Give its unit.

iv. Explain the condition under which electromagnetic waves are produced from a source.

v. What is meant by phase difference?

vi. Write four properties of parallel resonance circuit.

vii. Differentiate between paramagnetic and ferromagnetic substances.

viii. Define modulus of elasticity. Write down its three kinds.

ix. Why a photo diode is operated in reverse biased state?

x. Distinguish between soft magnetic material and hard magnetic material.

xi. What is solar cell? Give its uses.

xii. Draw the symbol of pnp and npn transistors six parts.

4. Write short answers to any SIX questions.   (2 x 6 = 12)

i. Does the induced emf always act to decrease the magnetic flux through a circuit?

ii. Can a D.C motor be turned into a D.C generator? What changes are required to be done?

iii. How fluctuations of the output can be reduced in D.C generator?

iv. What is meant by efficiency of transformer? Write few steps to improve the efficiency.

v. Which has the lower energy quanta? Radio waves or x – rays.

vi. Why don't we observe a Compton effect with visible light?

vii. Find the mass m of a moving object with speed 0.8 C.

viii. Find the speed of electron in the first Bohr orbit.

ix. Is energy conserved when an atom emits a photon of light?

SECTION – II

Note: Attempt any THREE (3) questions from Section II.

5. (a) Define electric potential. Derive the relation of an electric potential at a point due to point charge.   (5)

(b) A platinum wire has resistance of 10 ohm at 0°C and 20 ohm at 273°C. Find the value of temperature co-efficient of resistance of platinum.   (3)

6. (a) What is transformer? How does it work? Explain its use in transmission of electric load to long distances.   (5)

(b) What current should pass through a solenoid that is 0.5 m long with 10,000 turns of Copper wire so that it will have a magnetic field of 0.4 T?   (3)

7. (a) What is comparator circuit? How can it be used as a night switch?   (5)

(b) A 10 mH, 20 Ω coil is connected across 240 v and $\dfrac{180}{\pi}$ Hz source. How much power does it dissipate?   (3)

8. (a) What is meant by strain energy? How can it be determined from the force extension graph?   (5)

(b) Assuming you radiate as does a black body at your body temperature about 37°C, at what wavelength do you emit the most energy?   (3)

9. (a) What is LASER? Describe its working, population inversion and laser action.   (5)

(b) Find the mass defect and the binding energy for tritium, if the atomic mass of tritium is 3.016049 u.   (3)