**CBSE NEW MODEL QUESTION PAPER**

**Grade : XII Subject: PHYSICS Marks : 50**

**Time : 2 hrs. Topic: CURRENT ELECTRICITY**

***General Instructions*:**

*a) All the questions are compulsory.*

*b) There are 23 questions in total.*

*c) This question paper contains four sections: Section-A, Section-B, Section-C and Section-C*

*d) Section-A contains* ***10*** *questions of* ***one*** *mark each.*

*e) Section-B contains* ***5*** *questions of* ***two*** *marks each.*

*f) Section-C contains* ***5*** *questions of* ***three*** *marks each.*

*g) Section –D contains* ***3*** *questions of* ***five*** *marks each.*

**SECTION - A**

1. If drift velocity of electron is Vd and intensity of electric field is E, then which of the following

relation obeys the ohm’s law?

a)  b)  c)  d) 

2. The internal resistance of a 2.1V cell which gives a current of 0.2A through a resistance of 10Ω

is

a) 0.2Ω b) 0.5Ω c) 0.8Ω d) 1.0Ω

3. The speed of electromagnetic wave in vacuum depends upon the source of radiation

a) increases as we move from γ-rays to radio waves

b) decreases as we move from γ-rays to radio waves

c) is same for all of them

d) None of the above

*In the following questions 9 and 10 a statement of assertion followed by a statement of reason is given.*

*Choose the correct answer out of the following choices.*

*a) Assertion and reason both are correct statement and reason is correct explanation for*

*assertions*

*b) Assertion and reason both are correct statements but reason is not correct explanation for*

*assertion.*

*c) Assertion is correct statement but reason is wrong statement*

*d) Assertion is wrong statement but reason is correct statement*

4. *Assertion:* Electric current is a scalar quantity

*Reason:* Electric current arises due to continuous flow of charged particles.

5. *Assertion:* Short wave band is used for transmission of radio waves to large distances

*Reason:* Short waves are reflected by earth’s ionosphere.

6. Show on a graph, the variation of resistivity with temperature for a semiconductor.

***Or***

What is relaxation time? How is it related with temperature?

7. Define mobility. Write its S.I. units.

***Or***

Define specific resistance.

8. Name the colours corresponding to the digits 4 and 7 in the colour code scheme for carbon

resistors.

9. How is the speed of electromagnetic waves in vacuum determined by the electric and magnetic

fields?

10. Name the electromagnetic waves which

i) Maintain the earth’s warmth and ii) are used in the aircraft navigation

**SECTION - B**

11. The sequence of coloured bands in two carbon resistors R1 and R2 is

i) brown, green, blue and

ii) orange, black, green.

Find the ratio of their resistances.

12. A cell of emf E and internal resistance r is connected across a variable resistor R. Plot a graph

showing the variation of terminal potential V with resistance R.

***Or***

In a meter bridge, two unknown resistances R and S, when connected between the two gaps, gives a null point is 40cm from one end. What is the ratio of R and S?

13. What is the difference between emf and terminal voltage?

***Or***

Explain about temperature coefficient of resistance.

14. Obtain the expression for Ohm’s law using the concept of drift velocity.

15. a) Why are infared waves often called heat waves? Explain.

b) What do you understand by the statement “electromagnetic wave transport momentum”?

**SECTION – C**

16. Obtain the relation between drift velocity and relaxation time.

***Or***

Explain how to determine the internal resistance of a given cell using a potentiometer.

17. Obtain expressions for combination of three resistors connected in series and parallel and draw its circuit diagrams.

18. Derive an expression for the current density of a conductor in terms of the drift speed of electrons.

19. Explain about Meter Bridge with necessary circuit diagram.

***Or***

Obtain an expression of current in a circuit which contains n identical cells connected in series.

20. Show that average value of radiant flux density S over a single period T is given by



***Or***

Name the electromagnetic waves, in the wave length range 10 nm to  How are these

waves generated? Write their two uses?

**SECTION – D**

21. State the working principle of a potentiometer. With the help of the circuit diagram, explain

how a potentiometer is used to compare the emf’s of two primary cells. Obtain the required

expression used for comparing the emf’s.

22. State and explain Kirchhoff’s rules for an electric network. Using Kirchhoff’s rules, obtain the balance condition in terms of the resistances of four arms of Wheatstone bridge.

23. Obtain an expression for effective emf and resistance in a circuit which contains 2 different cells connected in parallel.

***Or***

i) Describe briefly how electromagnetic waves are produced by oscillating charges.

ii) Give one use of each of the following

a) Microwaves b) X-rays c) Infrared rays d) Gamma rays

iii) Show that the radiation pressure exerted by an EM wave of intensity I on surface kept in vacuum is 

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