MOVING CHARGES AND MAGNETISM

1. Give the SI unit of magnetic permeability of free space.
a) T A m^{-2}
b) T A^{-2} m
c) T A^{-1} m
d) T A m^{2}

2. State the rule that is used to find the direction of field acting at a point near a current-carrying straight conductor.
a) Cork rule
b) The right-hand thumb rule
c) Swimming rule
d) Flemings rule

3. Give the dimensional formula for magnetic permeability of free space.
a) [M L T^{-2} A^{-2}]
b) [M^{2} L T^{-2} A^{-2}]
c) [M L^{2} T^{-2} A^{-2}]
d) [M^{-1} L T^{-2} A^{-2}]

4. A wire placed along the north-south direction carries a current of 8 A from south to north. Find the magnetic field due to a 1 cm piece of wire at a point 200 cm north-east from the piece.
a) 14 × 10^{-9} T
b) 1004 × 10^{-9} T
c) 204.4 × 10^{-9} T
d) 1.4 × 10^{-9} T

5. Which of the following is not a point of similarity between Biot-Savart law and Coulomb's law.
a) Both fields depend inversely on the square of the distance from the source to the point of observation
b) They are not a universal law
c) The principle of superposition does not apply to both
d) Both are long-range fields

6. The magnetic field due to a current element is minimum in a plane passing through the element when it is perpendicular to its axis. State true or false.
a) True
b) False

7. Give the SI unit of the magnetic field from Biot-Savart law.
a) Ampere
b) Tesla
c) Weber

d) Gauss
8. How many quantities are required to specify the magnetic field of the earth?
a) 1
b) 2
c) 3
d) 4

9. Which of the following is the definition for magnetic meridian of Earth?
a) Vertical plane passing through the axis of a freely suspended or pivoted magnet
b) Horizontal plane passing through the axis of a freely suspended or pivoted magnet
c) Vertical plane passing through the geographical North Pole and South Pole at a given place
d) Horizontal plane passing through the geographical North Pole and South Pole at a given place

10. Which among the following is denoted by δ?
a) Horizontal component
b) Magnetic meridian
c) Magnetic declination
d) Magnetic inclination

11. The Earth always have both horizontal and vertical components everywhere.
a) True
b) False

12. Identify the expression for horizontal component from the following.
a) B_H=Bcosδ
b) B=B_H cosδ
c) B_H=$Bcos\delta$
d) B_H=2Bcosδ

13. At the magnetic North Pole of the Earth, what is the value of the angle of dip?
a) Zero
b) Minimum
c) Infinity
d) Maximum
14. At a given place on the Earth's surface, the horizontal component of Earth's magnetic field is 9×10^{-5} T and the resultant magnetic field is 180×10^{-6}. Calculate the angle of dip at this place.
a) 45^o
b) 0^o
c) 60^o

d) 30°

15. When is the angle of dip at a place equal to 45°?
a) When the vertical and horizontal components of earth's magnetic field are equal
b) When the vertical component is twice the horizontal component of earth's magnetic field
c) When the vertical component is half the horizontal component of earth's magnetic field
d) When either the vertical component or the horizontal components of earth's magnetic field is equal to zero

16. The angle of dip at a certain place on Earth is 30° and the magnitude of Earth's horizontal component of magnetic field is 0.35 G. Find the magnetic field at that place on Earth.
a) 0.35 G
b) 0.40 G
c) 0.45 G
d) 0.50 G

17What is the relation between angle of dip and magnetic latitude?
a) $\tan\delta=4\tan\lambda$
b) $\tan\delta=4tan\lambda$
c) $\tan\delta=2tan\lambda$
d) $\tan\delta=2\tan\lambda$

18. What is moving coil galvanometer used for?
a) Measurement of voltage only
b) Measurement of resistance
c) Measurement of small currents
d) Measurement of electric field

19. Pick out the expression for galvanometer constant from the following?
a) G = $kNAB$
b) G = k × NAB
c) G = $NABk$
d) $1G=kNAB$

20. Find the true statement.
a) Ammeter is an instrument used to measure potential difference across any element in a circuit
b) Voltmeter is an instrument used to measure current in a circuit
c) Galvanometer constant is dimensionless
d) Current sensitivity is expressed as the exact reverse of the galvanometer constant

ANSWERS-1.(C) 2.(B) 3.(A) 4.(D) 5.(C) 6.(B) 7.(B) 8.(C) 9.(A) 10.(D)
11.(B) 12.(A) 13.(D) 14.(C) 15.(A) 16.(B) 17.(D) 18.(C) 19.(A) 20.(D)