CASE STUDY-1
ELECTRIC FLUX

1.   If a unit positive charge is kept in the air, then what is the total flux coming out of unit charge is (choose from option given below)

(a) q/ε_0 (b) $1/\varepsilon_0$ (c) zero   (d) q/ε_0

ANS - (b)

2. when is the flux through a surface taken as positive

(a) When the flux lines are directed outward

(b) when the flux lines are directed inward

(c) when no charge is there

(d) when charge is negative.

ANS- (a)

3. a plane surface is rotated in a uniform electric field when is the flux of the electric field through the surface is maximum

(a) when surface is parallel to field lines

(b) when surface is anti parallel to field lines

(c) when surface is perpendicular to field lines

(d) when area vector is inclined at an angle 45^0 to field lines

ANS- (c)

4. what is the value of electric flux on a plane of area 1 m^2 on which an electric field of 3 Volt/m crosses with an angle of 30^0.

(a)1Vm   (b) 2Vm   (c) 3Vm   (d) 1.5Vm

ANS- (d)

5. Assertion-Reasoning Question:

Assertion : The electric flux of the electric field $\oint E.dA$ is zero. The electric field is zero everywhere on the surface.
Reason : The charge inside the surface is zero.

ANS- (D) A is false and R is also false.

CASE STUDY-1
ELECTRIC DIPOLE

6. The dipole moment of a dipole in a uniform external field $\bar{E}$ is B. Then the torque т acting on the dipole is

(a) $\tau = p \times E$

(b) $\tau = P. \bar{E}$

(c) $\tau = 2(p + \bar{E})$

(d) $\tau = (P + E)$

ANS- (a)

7. Read the following question and choose the answer from options given below-

An electric dipole consists of two opposite charges, each of magnitude 1.0 μC separated by a distance of 2.0 cm. The dipole is placed in an external field of 10^5 NC^{-1}. The maximum torque on the dipole is
(a) 0.2×10^{-3} Nm
(b) 1×10^{-3} Nm
(c) 2×10^{-3} Nm
(d) 4×10^{-3} Nm

ANS- (c)

8. Torque on a dipole in uniform electric field is minimum when θ is equal to

(a) 0°

(b) 90°

(c) 180°

(d) Both (a) and ©

ANS- (d)

9.   When an electric dipole is held at an angle in a uniform electric field, the net force F and torque т on the dipole are

(a) F= 0, т = 0
(b) F≠0, т≠0
(c) F=0, т ≠ 0
(d) F≠0, т=0

ANS- (c)

10. Assertion-Reasoning Question:
Assertion (A) : In an electric dipole two equal and opposite small charges are placed small distance apart.
Reason (R) : An isolated non-polar molecule behaves like an electric dipole.

ANS- (C) A is true but R is false..