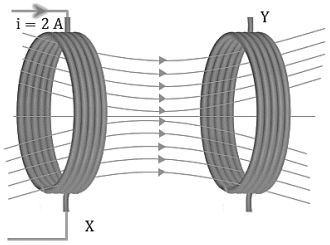
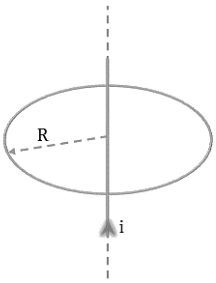
**Q.1** Two coils **X** and **Y** are placed in a circuit such that when the current changes by **2 A** in coil **X** the magnetic flux changes by **0.4 Wb** in**Y**. The value of mutual inductance of the coils is-



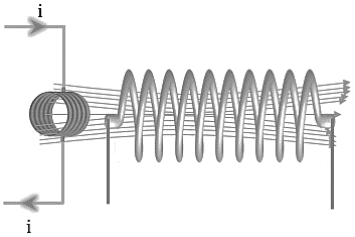

**(A)**0.2 H **(B)**5 H **(C)**0.8 H **(D)**4 H

**Q.2** A long straight wire carrying current **i** is placed along the axis of a circular ring of radius**R**. The mutual inductance of this system is



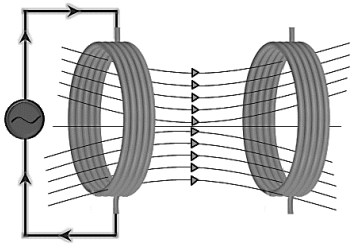

**(A)** $\frac{\mu_0 R}{2}$ **(B)** $\frac{\mu_0 \pi R}{2}$ **(C)** $\frac{\mu_0}{2}$ **(D)**Zero

**Q.3** Coil of **100** turns and having radius **1 cm** is kept co-axially within a long solenoid of **8** turns per **cm** with radius**5 cm**. Find the mutual inductance between the coil and solenoid-



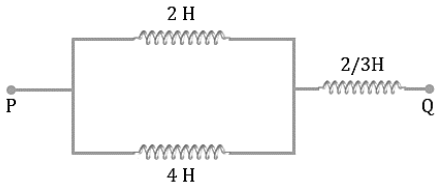

**(A)** $2.25 \times 10^{-5}$ H **(B)** $4.75 \times 10^{-5}$ H **(C)** $1.35 \times 10^{-5}$ H **(D)** $3.15 \times 10^{-5}$ H

**Q.4** Two coaxial coils are very close to each other and their mutual inductance is**3 H**. If a current $\mathbf{i_1 = 2}\sin\mathbf{30t\ A}$ is passing through the first coil, then find the peak value of induced **emf** in the second coil.



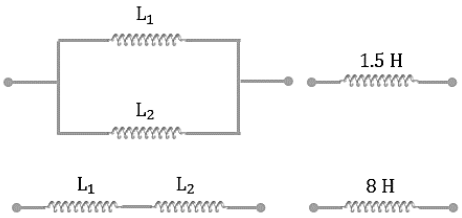
**(A)**0 V **(B)**90 V **(C)** $\frac{180}{\sqrt{2}}$ V **(D)**180 V

**Q.5** The equivalent inductance between points **P** and **Q** is



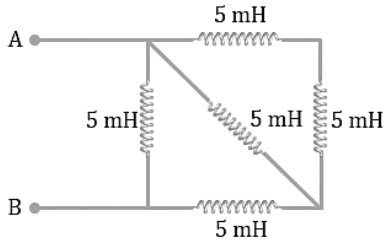

**(A)**2 H **(B)**4 H **(C)**6 H **(D)**8 H

**Q.6** Two inductances connected in parallel are equivalent to a single inductance of $\mathbf{1.5\ H}$ and when connected in series are equivalent to a single inductance of $\mathbf{8\ H}$. The difference in their inductance is-



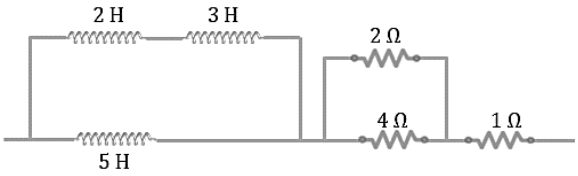

**(A)**3 H **(B)**7.5 H **(C)**2 H **(D)**4 H

**Q.7** Find the equivalent inductance in the combination given below between points **A** and**B**.




**(A)**3.8 Mh **(B)**3.1 mH **(C)**2.4 mH **(D)**5.6 Mh

**Q.8** The time constant of the given circuit is-




**(A)**0.032 s **(B)**0.032 s **(C)**0.18 s **(D)**1.07 s

**Q.9** If the voltage of a source in an AC circuit is represented by the equation, $\mathcal{E} = \mathbf{220}\sqrt{\mathbf{2}}\mathbf{sin}(\mathbf{314t})$. The frequency of the voltage is –

**(A)**100 Hz **(B)**50 Hz **(C)**200 Hz **(D)**150 Hz

**Q.10** If the voltage of a source in an AC circuit is represented by the equation, $\mathcal{E} = \mathbf{220}\sqrt{\mathbf{2}}\mathbf{sin}(\mathbf{314t})$. Calculate the peak value of the current if the net resistance of the circuit is$\mathbf{220\ \Omega}$.

**(A)**1.8 A **(B)**1.6 A **(C)**1.4 A **(D)**1.2 A

## ANSWER KEY

| Q. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sol.** | (A) | (D) | (D) | (D) | (A) | (D) | (B) | (D) | (B) | (C) |