

BASIC ELECTRICAL ENGINEERING

41. A parallel plate capacitor has a capacitance of $2\mu\text{F}$. If one of the sides of the plate is doubled and the distance between them is halved, the capacitance of the capacitor is
- (A) $1\mu\text{F}$ (B) $0.5\mu\text{F}$
(C) $2\mu\text{F}$ (D) $8\mu\text{F}$
42. $1\mu\text{F}$ capacitor is connected across a 12 volt battery, its steady state current will be
- (A) Zero (B) 0.001A
(C) 1mA (D) ∞
43. Two resistors each of 4 ohm are connected in parallel. The parallel combination is connected in series with a 2 ohm resistor. If this circuit is connected across a 100Volt supply, the total current drawn is
- (A) 20A (B) 25A
(C) 10A (D) 16.33A
44. Current flowing through an inductor of inductance 2mH is 5A. The energy stored in the inductor is
- (A) 50mJ (B) 100mJ
(C) 25mJ (D) 12.5mJ
45. A 1mA ammeter has a resistance of 100ohm. It is to be converted to 1 Amp ammeter. The value of the shunt resistance is
- (A) 0.001 ohm (B) 0.1001 ohm
(C) 100000 ohm (D) 100 ohm

ENGINEERING MECHANICS

81. In SI Units ,the units of force and power are respectively
- (A) Newton and watt
 - (B) Newton and Pascal
 - (C) Newton and Joule
 - (D) Newton and Hertz
82. A number of forces acting at a point will be in equilibrium if
- (A) their total sum is zero
 - (B) sum of the components of this forces resolved in any two mutually perpendicular direction are equal
 - (C) sum of the components of the forces resolved in any two mutually perpendicular directions are zero each
 - (D) all the forces are having the same direction.
83. If the resultant of two forces P and Q acting at an angle θ makes an angle α with P, then
- (A) $\tan \alpha = P \sin \theta / (Q - P \cos \theta)$
 - (B) $\tan \alpha = Q \sin \theta / (P + Q \cos \theta)$
 - (C) $\tan \alpha = P \sin \theta / (P + Q \tan \theta)$
 - (D) $\tan \alpha = Q \sin \theta / (P + Q \tan \theta)$

MATHEMATICS

1. The solution of the differential equation $\frac{dy}{dx} = \frac{x(2\log x)}{\sin y \cos y}$ is
- (A) $y \cos y = x^2 \log x + c$
- (B) $y \sin y = x^2 \log x + c$
- (C) $y \cos y = 3x^2 \log x + c$
- (D) None of these
2. The differential equation $dr(2r \cot \theta - \sin 2\theta) d\theta = 0$ has solution
- (A) $r \sin^2 \theta = \frac{\sin^4 \theta}{2} + c$
- (B) $r \sin^2 \theta = \frac{\sin^4 \theta}{2} + c$
- (C) None of these
- (D) $r \sin^2 \theta = \frac{\sin^4 \theta}{2} + c$
3. A coil having a resistance of 15 ohms and an inductance of 10 henries is connected to 90 volts supply. The value of current after 2 seconds is
- (A) 5.345 amp
- (B) 5.00 amp
- (C) 45.6 amp
- (D) None of these
4. A real general solution of the differential equation $x^2 D^2 + 7xD + 9y = 0$ is
- (A) $(c_1 + c_2 \ln x)x^3$
- (B) $(c_1 x + c_2 \ln x)x^3$
- (C) $(c_1 + c_2 \ln x)x^3$
- (D) $(c_1 + c_2 \ln x)x^3$