

Electronics & Communication

1 A digital-to-analog converter with a full-scale output voltage of 3.5 V has a resolution close to 14m V. Its bit size is

- A) 4
- B) 8
- C) 16
- D) 32

Answer : (B)

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2 A single-phase half-controlled rectifier is driving a separately excited dc motor. The dc motor has a back emf constant of 0.5 V/rpm. The armature current is 5 A without any ripple. The armature resistance is 2W. The converter is working from a 280 V, single phase ac source with a firing angle of 80°. Under this operating condition, the speed of the motor will be

- A) 339 rpm
- B) 359 rpm
- C) 366 rpm
- D) 386 rpm

Answer : (C)

3 In relation to the synchronous machines, which one of the following statements is false?

- A) In salient pole machines, the direct-axis synchronous reactance is greater than the quadrature-axis synchronous reactance
- B) The damper bars help the synchronous motor self start
- C) Short circuit ratio is the ratio of the field current required to produce the rated voltage on open circuit to the rated armature current
- D) The V-curve of a synchronous motor represents the variation in the armature current with field excitation, at a given output power

Answer : (C)

4 A parallel plate air-filled capacitor has plate area of 10^{-4} m^2 and plate separation of 10^{-3} m . It is connected to a 0.5 V, 3.6 GHz source. The magnitude of the displacement current is ($\epsilon_0 = 1/36\pi \times 10^{-9} \text{ F/m}$)

- A) 10 mA
- B) 100 mA
- C) 10 A
- D) 1.59 mA

Answer : (A)

5 The 8085 assembly language instruction that stores the content of H and L registers into the memory locations 2050H and 2051H, respectively, is

- A) SPHL 2050_H
- B) SPHL2051_H
- C) SHLD 2050_H
- D) STAX 2050_H

Answer : (C)

6 If E is the electric field intensity, $\nabla(\nabla \times E)$ is equal to

- A) E
- B) $|E|$
- C) null vector
- D) zero

Answer : (D)

7 The insulation strength of an EHV transmission line is mainly governed by

- A) load power factor
- B) switching over-voltages
- C) harmonics
- D) corona

Answer : (B)

8 The Q - meter works on the principle of

- A) mutual inductance
- B) self inductance
- C) series resonance
- D) parallel resonance

Answer : (C)

9 A 800 kV transmission line is having per phase line inductance of 1.1 mH/km and per phase line capacitance of 11.68 nF/km. Ignoring the length of the line, its ideal power transfer capability in MW is

- A) 1204 MW
- B) 1504 MW
- C) 2085 MW
- D) 2606 MW

Answer : (C)

10 In a PCM system, if the code word length is increased from 6 to 8 bits, the signal to quantization noise ratio improves by the factor

- A) 8/6
- B) 12
- C) 16
- D) 8

Answer : (C)

11 At an industrial sub-station with a 4 MW load, a capacitor of 2 MVAR is installed to maintain the load power factor at 0.97 lagging. If the capacitor goes out of service, the load power factor becomes

- A) 0.85
- B) 1.00
- C) 0.80 lag

D) 0.90 lag

Answer : (C)

12 The conduction loss versus device current characteristic of a power MOSFET is best approximated by

A) a parabola

B) a straight line

C) a rectangular hyperbola

D) an exponentially decaying function

Answer : (A)

13 High Voltage DC (HVDC) transmission is mainly used for

A) bulk power transmission over very long distances

B) inter-connecting two systems with the same nominal frequency

C) eliminating reactive power requirement in the operation

D) minimizing harmonics at the converter stations

Answer : (A)

14 For the equation,

$$s^3 - 4s^2 + s + 6 = 0$$

the number of roots in the left half of s-plane will be

A) 0

B) 1

C) 2

D) 3

Answer : (C)

15 For the function $f(x) = x^2 e^{-x}$, the maximum occurs when x is equal to

A) 2

B) 1

C) 0

D) -1

Answer : (B)