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CPRI Engineering Assistant (Electrical) 2026 Mock Test 1

Total Questions: **40** | Sections: **12**

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Circuit Fundamentals

Q.1–5 | 5 questions

Q.1 A coil of inductance 0.6 H and resistance 12 Ω is switched on to a dc supply. The time constant of the circuit is

(A) 20 s **(B)** 0.05 s **(C)** 7.2 s **(D)** 0.5 s

Q.2 A copper wire of length 100 m and cross-section 1.7 mm^2 has resistivity 1.7×10^{-8} Ω m. Its resistance is

(A) 1 Ω **(B)** 10 Ω **(C)** 0.1 Ω **(D)** 100 Ω

Q.3 A coil has resistance 50 Ω at 20°C with temperature coefficient 0.004 /°C at 20°C. Its resistance at 70°C is

(A) 64 Ω **(B)** 62.5 Ω **(C)** 60 Ω **(D)** 70 Ω

Q.4 A two-terminal network has a Thevenin equivalent of 20 V in series with 4 Ω. Its Norton equivalent is

(A) 5 A source in series with 4 Ω **(B)** 80 A source in parallel with 4 Ω

(C) 0.2 A source in parallel with 4 Ω **(D)** 5 A source in parallel with 4 Ω

Q.5 While a capacitor charges through a resistor from a dc source, its voltage after one time constant reaches about what fraction of the supply voltage?

(A) 36.8% **(B)** 63.2% **(C)** 50.0% **(D)** 86.5%

Magnetism And Induction

Q.6 | 1 question

Q.6 A coil of 500 turns links a flux of 0.2 mWb when it carries 2 A. Its self inductance is

(A) 50 mH **(B)** 100 mH **(C)** 200 mH **(D)** 0.1 mH

AC Circuits

Q.7–10 | 4 questions

Q.7 At resonance in a series RLC circuit connected to a sinusoidal supply, which statement is correct?

(A) Impedance is maximum and the current is in phase with the supply voltage

(B) Impedance is minimum and the current lags the supply voltage by 90°

(C) Impedance is minimum and the current is in phase with the supply voltage

(D) Impedance is maximum and the current lags the supply voltage by 90°

Q.8 A voltage $v = 141\sin(314t + 60°)$ V drives a current $i = 10\sin(314t + 20°)$ A. The current

(A) leads the voltage by 40° **(B)** lags the voltage by 80°

(C) leads the voltage by 80° **(D)** lags the voltage by 40°

Q.9 A series RLC circuit has $R = 10\ \Omega$, $L = 0.1$ H and $C = 10\ \mu$F. Its bandwidth is approximately

(A) 15.9 Hz **(B)** 159 Hz **(C)** 31.8 Hz **(D)** 1.59 Hz

Q.10 A load draws 10 A from a 230 V supply at 0.8 power factor lagging. Its active and reactive power are

(A) $P = 1380$ W, $Q = 1840$ var **(B)** $P = 1840$ W, $Q = 1380$ var

(C) $P = 2300$ W, $Q = 1380$ var **(D)** $P = 1840$ W, $Q = 2300$ var

DC Machines

Q.11–13 | 3 questions

Q.11 A 4-pole lap-wound dc generator has 400 conductors, flux 0.02 Wb per pole and runs at 600 rpm. The generated emf is

(A) 160 V **(B)** 40 V **(C)** 320 V **(D)** 80 V

Q.12 A 220 V dc shunt motor has armature resistance 0.5 Ω and draws 20 A at 1000 rpm. With constant flux, the load rises and speed falls to 900 rpm. The new armature current is

(A) 44 A **(B)** 31 A **(C)** 62 A **(D)** 40 A

Q.13 Which dc motor is preferred for electric traction, and why?

(A) DC series motor, because its torque rises with the square of armature current

(B) DC shunt motor, because its speed stays nearly constant from no load to full load

(C) Differentially compounded motor, because its speed rises as the load rises

(D) Separately excited motor, because its field flux is independent of the armature current

Transformers

Q.14–15 | 2 questions

Q.14 A distribution transformer fed from a high-voltage line must supply a four-wire 415 V system with a neutral. The usual connection is

(A) Star primary and delta secondary **(B)** Delta primary and delta secondary

(C) Star primary and star secondary **(D)** Delta primary and star secondary

Q.15 A 100 kVA transformer has core loss 1 kW and full-load copper loss 2 kW. It supplies full load at unity power factor for 12 h and stays energised on no load for the other 12 h. Its all-day efficiency is

(A) 97.09% **(B)** 98.04% **(C)** 96.15% **(D)** 94.34%

Induction And Synchronous Machines

Q.16–19 | 4 questions

Q.16 A single-phase induction motor with a capacitor permanently connected in series with its auxiliary winding and no centrifugal switch is called a

(A) Capacitor-start motor **(B)** Permanent split capacitor motor

(C) Shaded-pole motor **(D)** Resistance split-phase motor

Q.17 A 4-pole, 50 Hz induction motor runs at 1440 rpm. The rotor current frequency is

(A) 1 Hz **(B)** 4 Hz **(C)** 2 Hz **(D)** 48 Hz

Q.18 Compared with a squirrel-cage motor, a slip-ring induction motor is preferred for heavy starting loads because

(A) external rotor resistance gives high starting torque with low starting current

(B) its rotor has no brushes, which gives higher starting torque with less maintenance

(C) its synchronous speed is higher, which gives a larger starting torque

(D) its stator is connected in delta, which gives a lower starting current

Q.19 Damper windings are provided in a synchronous motor mainly to

(A) boost the field flux and improve power factor at light load

(B) damp rotor oscillations about synchronous speed and assist self-starting

(C) cancel armature reaction flux and improve voltage regulation

(D) reduce iron loss in the stator core and improve efficiency

Generation Transmission And Distribution

Q.20–27 | 8 questions

Q.20 A rooftop solar PV array feeds an ac grid through an inverter because the array produces

(A) ac power, which the inverter steps up to the grid voltage

(B) dc power, which the inverter rectifies before feeding the grid

(C) ac power, which the inverter converts to dc for the grid

(D) dc power, which the inverter converts to ac at the grid frequency

Q.21 A consumer is charged Rs 150 per kW of maximum demand plus Rs 4 per kWh. The maximum demand is 8 kW and the energy used is 500 kWh. The bill is

(A) Rs 2000 **(B)** Rs 1200 **(C)** Rs 4000 **(D)** Rs 3200

Q.22 Corona loss on a high-voltage overhead line is reduced by

(A) reducing the spacing between the line conductors

(B) using bundled conductors with larger effective diameter

(C) using conductors of smaller diameter to reduce weight

(D) raising the operating voltage with the same conductors

Q.23 A single-phase feeder (go and return) has total resistance 0.4 Ω and reactance 0.2 Ω. It carries 20 A at 0.8 power factor lagging. The approximate voltage drop is

(A) 8.8 V **(B)** 8.0 V **(C)** 4.0 V **(D)** 12.0 V

Q.24 The voltage regulation of a short transmission line can become negative when the load power factor is

(A) lagging and sufficiently low
(B) lagging and close to unity
(C) leading and sufficiently low
(D) exactly unity

Q.25 Diversity factor of a power system is the ratio of

(A) the system maximum demand to the sum of the individual maximum demands
(B) the sum of the individual maximum demands to the system maximum demand
(C) the average load over the period to the system maximum demand
(D) the system maximum demand to the total connected load of the system

Q.26 A wind turbine has a rotor of diameter 20 m. The wind speed is 10 m/s, air density is 1.2 kg/m^3 and the power coefficient is 0.4. The output power is about

(A) 188.5 kW **(B)** 301.6 kW **(C)** 75.4 kW **(D)** 7.54 kW

Q.27 In a steam power station working on the Rankine cycle, the correct sequence of the main components in the water-steam circuit is

(A) Boiler, turbine, superheater, condenser, feed pump
(B) Boiler, superheater, condenser, turbine, feed pump
(C) Boiler, superheater, turbine, feed pump, condenser
(D) Boiler, superheater, turbine, condenser, feed pump

Switchgear And Protection

Q.28–29 | 2 questions

Q.28 A lightning arrester is connected

(A) between the line and earth, near the equipment to be protected
(B) in series with the line, ahead of the equipment to be protected
(C) between two phases of the line, near the equipment to be protected
(D) across the circuit breaker contacts, near the equipment to be protected

Q.29 Which circuit breaker extinguishes the arc using the high dielectric strength of an electronegative gas?

(A) SF_6 circuit breaker
(B) Air-blast circuit breaker
(C) Vacuum circuit breaker
(D) Bulk oil circuit breaker

Measurements And Instruments

Q.30–31 | 2 questions

Q.30 A PMMC meter has full-scale current 2 mA and coil resistance 50 Ω. To read 0-100 V, the series multiplier resistance required is

(A) 50.00 kΩ **(B)** 49.95 kΩ **(C)** 50.05 kΩ **(D)** 25.00 kΩ

Q.31 An energy meter has a constant of 1200 revolutions per kWh. Its disc makes 60 revolutions in 3 minutes. The load power is

(A) 0.05 kW **(B)** 20.00 kW **(C)** 1.00 kW **(D)** 3.00 kW

Wiring Illumination And Safety

Q.32–33 | 2 questions

Q.32 In soldering an electrical joint, the purpose of the flux is to

(A) act as a filler metal that gives the joint its mechanical strength

(B) lower the resistance of the joint by adding a conducting layer

(C) raise the melting point of solder so the joint stays rigid in service

(D) remove the oxide film so that molten solder spreads and bonds well

Q.33 An installation has 10 lamps of 60 W, 5 fans of 80 W and 2 heaters of 1 kW on a 230 V single-phase supply. With every load on at unity power factor, the current is about

(A) 7.5 A **(B)** 17.4 A **(C)** 13.0 A **(D)** 26.1 A

Electronics And Power Electronics

Q.34–38 | 5 questions

Q.34 The minimum number of 2-input NAND gates needed to realise a 2-input OR gate is

(A) 3 **(B)** 2 **(C)** 4 **(D)** 5

Q.35 The ripple factor of a full-wave rectifier without a filter is approximately

(A) 1.210 **(B)** 0.707 **(C)** 0.318 **(D)** 0.482

Q.36 When a BJT works as a switch, its two states correspond to

(A) ON in cut-off and OFF in saturation

(B) ON in saturation and OFF in cut-off

(C) ON in the active region and OFF in cut-off

(D) ON in saturation and OFF in the active region

Q.37 A step-down chopper has a fixed dc input of 200 V and duty ratio 0.4. The average output voltage is

(A) 120 V **(B)** 500 V **(C)** 160 V **(D)** 80 V

Q.38 The decimal equivalent of the binary number 1011011 is

(A) 109 **(B)** 89 **(C)** 91 **(D)** 93

Utilization And Drives

Q.39–40 | 2 questions

Q.39 Which heating method is used for surface hardening of steel gears?

(A) Resistance heating **(B)** Induction heating

(C) Arc heating **(D)** Dielectric heating

Q.40 A pump delivers 36 m^3/h against a total head of 20 m with an overall efficiency of 0.6. The input power required is about

(A) 3.27 kW **(B)** 1.96 kW **(C)** 1.18 kW **(D)** 11.77 kW

Get the Answers with Explanations

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