BunkPoint MOCK TEST

RVUNL JE Electrical 2026 Mock Test 1

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Electrical Circuits

Q.1–6 | 6 questions

Q.1 In a series RLC circuit with fixed L and C, the resistance R is doubled. Which statement correctly describes the change at resonance?

(A) Q halves, bandwidth halves, f_0 unchanged

(B) Q halves, bandwidth doubles, f_0 unchanged

(C) Q doubles, bandwidth halves, f_0 unchanged

(D) Q halves, bandwidth doubles, f_0 halves

Q.2 In a balanced three-phase delta-connected load supplied with positive (ABC) phase sequence, each line current is

(A) $\sqrt{3}$ times the phase current and lags it by 30°

(B) $1/\sqrt{3}$ times the phase current and lags it by 30°

(C) equal to the phase current and lags it by 30°

(D) $\sqrt{3}$ times the phase current and leads it by 30°

Q.3 At a node, currents of 8 A and 5 A enter and a current of 6 A leaves through one branch. A fourth branch carries the remaining current. This current is

(A) 3 A leaving the node **(B)** 19 A leaving the node

(C) 7 A entering the node **(D)** 7 A leaving the node

Q.4 In nodal analysis, an ideal voltage source connects two non-reference nodes. The standard method is

(A) applying KVL around a supermesh and ignoring the two node voltages entirely

(B) treating the source current as zero and applying KCL at both nodes separately

(C) forming a supernode with KCL and adding the source voltage as a constraint

(D) open-circuiting the source and writing separate KCL equations at each node

Q.5 A two-port network has $Z_{11} = 10\,\Omega$, $Z_{12} = Z_{21} = 4\,\Omega$ and $Z_{22} = 8\,\Omega$. With a $12\,\Omega$ load across port 2, the input impedance at port 1 is

(A) $8.7\,\Omega$ **(B)** $8.0\,\Omega$ **(C)** $9.2\,\Omega$ **(D)** $6.0\,\Omega$

Q.6 A source has Thevenin voltage 60 V and Thevenin resistance $15\,\Omega$. It feeds a variable load R_L connected in series with a fixed $5\,\Omega$ resistor. The maximum power that can be delivered to R_L is

(A) 44.1 W **(B)** 28.8 W **(C)** 36 W **(D)** 45 W

Electromagnetic Field Theory

Q.7–9 | 3 questions

Q.7 A long air-cored solenoid has 500 turns, length 0.4 m and carries 2 A. The flux density at its centre is approximately

(A) 3.14 mT **(B)** 1.57 mT **(C)** 1.26 mT **(D)** 6.28 mT

Q.8 An air-filled parallel-plate capacitor stays connected to a battery while the gap is completely filled with a dielectric of $\epsilon_r = 4$. The stored energy becomes

(A) one-fourth of the original value **(B)** four times the original value

(C) twice the original value **(D)** equal to the original value

Q.9 A parallel-plate capacitor is charged by a time-varying source. The displacement current between the plates is

(A) zero, since no free charge actually crosses the gap between the two plates

(B) proportional to the rate of change of magnetic flux through the gap region

(C) equal to the wire conduction current, so the total current stays continuous

(D) equal to the conduction current multiplied by the relative permittivity of the gap

Electrical Materials

Q.10–12 | 3 questions

Q.10 For a pure metal such as copper, the temperature coefficient of resistance is

(A) negative, since additional charge carriers are released as the temperature rises

(B) positive, since lattice vibrations scatter electrons more at higher temperature

(C) zero, since the free electron density remains constant as the temperature rises

(D) positive, since the number of free electrons increases as the temperature rises

Q.11 The dielectric strength of transformer oil is most seriously reduced by

(A) traces of dissolved moisture and fibres

(B) a moderate increase in the viscosity of the oil

(C) a slightly lower pour point of the oil sample

(D) a small increase in the flash point of the oil

Q.12 The forbidden energy gap of silicon at room temperature is approximately

(A) 5.5 eV **(B)** 2.2 eV **(C)** 0.7 eV **(D)** 1.1 eV

Electrical Measurements and Instrumentation

Q.13–23 | 11 questions

Q.13 Standardisation of a DC potentiometer is carried out to

(A) calibrate the galvanometer so it gives a larger deflection per unit current

(B) set the working current so the slide wire has a known drop per unit length

(C) measure the internal resistance of the test cell connected to the wire

(D) remove thermoelectric emfs produced at the sliding contact of the wire

Q.14 A galvanometer of resistance 100 Ω has a full-scale current of 1 mA. To read up to 50 mA, the shunt resistance required is

(A) 1.92 Ω **(B)** 2.00 Ω **(C)** 1.96 Ω **(D)** 2.04 Ω

Q.15 A voltmeter of range 0 to 200 V has a guaranteed accuracy of $\pm 1\%$ of full-scale reading. The percentage limiting error at a reading of 50 V is

(A) $\pm 4\%$ **(B)** $\pm 1\%$ **(C)** $\pm 2\%$ **(D)** $\pm 0.25\%$

Q.16 A moving-coil meter with full-scale current 1 mA and internal resistance 50 Ω is to be used as a 0 to 100 V voltmeter. The series multiplier resistance is

(A) 100.00 k□ **(B)** 100.05 k□ **(C)** 99.95 k□ **(D)** 99.00 k□

Q.17 Consider the following statements about temperature transducers:
(1) A thermocouple generates an emf from the temperature difference between its two junctions.
(2) A platinum RTD has a positive temperature coefficient of resistance.
(3) A thermocouple needs an external excitation source to produce its output emf.
Which statements are correct?

(A) 2 and 3 only **(B)** 1 and 2 only **(C)** 1, 2 and 3 **(D)** 1 and 3 only

Q.18 A metallic strain gauge material has a Poisson's ratio of 0.3. If its resistivity does not change with strain, its gauge factor is

(A) 2.0 **(B)** 1.3 **(C)** 1.6 **(D)** 0.6

Q.19 A Q-meter measures the quality factor of a coil by using the principle of

(A) series resonance, with capacitor voltage equal to Q times the injected voltage

(B) bridge balance, with the detector voltage equal to Q times the source voltage

(C) phase detection, with the output angle equal to Q times the injected angle

(D) parallel resonance, with the coil current equal to Q times the supply current

Q.20 Piezoelectric transducers are best suited to measuring

(A) steady static forces, since the generated charge remains indefinitely

(B) static displacement, since the crystal output voltage stays constant

(C) temperature, since the crystal emf depends on junction temperature

(D) rapidly varying forces, since charge leaks away under steady loads

Q.21 In a Schering bridge the unknown capacitor C_x with series resistance r_x forms arm Z_x. Balance is $Z_x/Z_2 = Z_3/Z_4$, where Z_2 is a loss-free capacitor C_2, Z_3 is a resistor R_3, and Z_4 is a resistor R_4 in parallel with a capacitor C_4. The unknown capacitance C_x is

(A) C_2R_4/R_3 **(B)** C_2R_3/R_4 **(C)** C_4R_3/R_4 **(D)** C_4R_4/R_3

Q.22 In an induction-type energy meter, the braking torque is produced by

(A) a shading band on the shunt magnet, giving torque proportional to voltage

(B) a spiral spring on the spindle, giving torque proportional to the deflection

(C) a permanent magnet whose disc eddy currents give torque proportional to speed

(D) the series coil flux acting on the disc, giving torque proportional to load current

Q.23 A 10-bit ADC has a full-scale input range of 5.12 V. The resolution (size of one LSB) is

(A) 5.005 mV **(B)** 5.000 mV **(C)** 512 mV **(D)** 10.00 mV

Analog and Digital Electronics

Q.24–31 | 8 questions

Q.24 The simplified form of $Y = AB + A\bar{B} + \bar{A}B$ is

(A) $\bar{A} + \bar{B}$ **(B)** AB **(C)** $A\bar{B} + \bar{A}B$ **(D)** $A + B$

Q.25 A three-section RC phase-shift oscillator uses $R = 10\,\text{k}\Omega$ and $C = 10\,\text{nF}$ in each section. The approximate frequency of oscillation is

(A) 650 Hz **(B)** 1.59 kHz **(C)** 3.90 kHz **(D)** 265 Hz

Q.26 The race-around condition in a level-triggered JK flip-flop occurs when

(A) $J \neq K$ and the clock pulse is longer than the propagation delay

(B) $J = K = 1$ and the clock pulse is longer than the propagation delay

(C) $J = K = 1$ and the clock pulse is shorter than the propagation delay

(D) $J = K = 0$ and the clock pulse is longer than the propagation delay

Q.27 The binary number 1011 expressed in Gray code is

(A) 1010 **(B)** 0110 **(C)** 1110 **(D)** 1101

Q.28 In a fixed-bias circuit, $V_{CC} = 12\,\text{V}$, $R_B = 470\,\text{k}\Omega$, $R_C = 2\,\text{k}\Omega$, $\beta = 100$ and $V_{BE} = 0.7\,\text{V}$. The collector-emitter voltage at the Q point is approximately

(A) 6.9 V **(B)** 4.8 V **(C)** 6.5 V **(D)** 7.2 V

Q.29 A common-emitter amplifier is biased at $I_C = 2.5\,\text{mA}$ with $R_C = 4\,\text{k}\Omega$ and no emitter resistance. Taking $V_T = 25\,\text{mV}$ and no load, the small-signal voltage gain is approximately

(A) -40 **(B)** $+400$ **(C)** -100 **(D)** -400

Q.30 The maximum theoretical efficiencies of a class B push-pull amplifier and a transformer-coupled class A amplifier are respectively

(A) 78.5% and 25% **(B)** 25% and 78.5% **(C)** 78.5% and 50% **(D)** 50% and 25%

Q.31 A single-pole amplifier has a gain-bandwidth product of 1 MHz. When used with a closed-loop gain of 20, its bandwidth is approximately

(A) 1 MHz **(B)** 50 kHz **(C)** 5 kHz **(D)** 20 MHz

Power Electronics

Q.32–39 | 8 questions

Q.32 For a single-phase full-wave uncontrolled rectifier with resistive load, the form factor of the output voltage is

(A) 1.11 **(B)** 1.57 **(C)** 0.48 **(D)** 1.21

Q.33 Which chopper configuration can drive a DC motor in all four quadrants, giving forward and reverse motoring and braking?

(A) Class E chopper **(B)** Class C chopper

(C) Class A chopper **(D)** Class D chopper

Q.34 IGBTs are widely preferred in high-power motor drive applications mainly because they offer

(A) a current-controlled gate with a higher switching speed than a power MOSFET

(B) a voltage-controlled gate with a higher switching speed than a power MOSFET

(C) a current-controlled gate with a low on-state drop at high current

(D) a voltage-controlled gate with a low on-state drop at high current

Q.35 A single-phase full-bridge inverter operates from $V_{dc} = 400\,\text{V}$ with sinusoidal PWM and amplitude modulation index 0.8 (linear range). The peak fundamental output voltage is

(A) 400 V **(B)** 320 V **(C)** 226 V **(D)** 160 V

Q.36 A single-phase half-wave controlled rectifier feeds a resistive load with firing angle α from a supply of peak voltage V_m. The average output voltage is

(A) $\frac{V_m}{\pi}(1+\cos\alpha)$ **(B)** $\frac{V_m}{2\pi}(1-\cos\alpha)$ **(C)** $\frac{V_m}{2\pi}(1+\cos\alpha)$ **(D)** $\frac{V_m}{\pi}\cos\alpha$

Q.37 Consider the following statements about switching converters and UPS systems:
(1) In a flyback converter the transformer delivers energy to the load while the main switch is ON.
(2) In a flyback converter, energy stored in the magnetising inductance reaches the output when the switch is OFF.
(3) An online UPS feeds the load through its inverter even when the mains supply is healthy.
Which statements are correct?

(A) 1 and 3 only **(B)** 1, 2 and 3 **(C)** 2 and 3 only **(D)** 1 and 2 only

Q.38 A three-phase fully controlled (six-pulse) bridge rectifier is fed from a 50 Hz supply. The lowest ripple frequency in the output voltage is

(A) 600 Hz **(B)** 300 Hz **(C)** 150 Hz **(D)** 100 Hz

Q.39 Consider the following statements about a phase-controlled rectifier with a freewheeling diode:
(1) A freewheeling diode stops the load voltage from reversing polarity with an inductive load.
(2) A freewheeling diode returns the stored load energy to the supply while the thyristors are off.
(3) A freewheeling diode improves the input power factor of a phase-controlled rectifier circuit.
Which statements are correct?

(A) 1 and 2 only **(B)** 1, 2 and 3 **(C)** 2 and 3 only **(D)** 1 and 3 only

Control Systems

Q.40–44 | 5 questions

Q.40 Consider the following statements about control system components:
(1) A DC tachogenerator gives an output voltage proportional to shaft acceleration.
(2) A tachogenerator is used to provide rate feedback for adding damping in a servo system.
(3) An AC servomotor has a positive-slope torque-speed curve over its stable operating range.
(4) An AC servomotor uses high rotor resistance so that its torque-speed slope is negative.
Which statements are correct?

(A) 2 and 4 only **(B)** 1 and 2 only **(C)** 1 and 3 only **(D)** 3 and 4 only

Q.41 A first-order system has a time constant of 2 s. The time taken for its unit step response to reach about 95% of the final value is

(A) 3 s **(B)** 4 s **(C)** 6 s **(D)** 2 s

Q.42 The integral action in a PID controller mainly

(A) reduces steady-state error for a step input and also improves the relative stability

(B) removes steady-state error for a step input but tends to reduce relative stability

(C) reduces the settling time by adding a zero close to the origin of the s-plane

(D) improves the transient damping of the system without changing its steady-state error

Q.43 A stable unity-feedback system has a gain margin of 12 dB. By what factor can the loop gain be increased before the system becomes unstable?

(A) approximately 4 **(B)** 6

(C) approximately 2 **(D)** 12

Q.44 In a negative feedback system with forward gain G and feedback gain H, the sensitivity of the closed-loop gain to variations in G is

(A) $1 + GH$ **(B)** $\dfrac{G}{1 + GH}$ **(C)** $\dfrac{GH}{1 + GH}$ **(D)** $\dfrac{1}{1 + GH}$

Electrical Machines

Q.45–53 | 9 questions

Q.45 A 25 kVA transformer has an iron loss of 200 W and a full-load copper loss of 300 W. It supplies full load at unity power factor for 8 hours and runs on no load for the other 16 hours. The all-day efficiency is approximately

(A) 94.3% **(B)** 98.0% **(C)** 96.5% **(D)** 97.7%

Q.46 A DC series motor should never be started on no load because

(A) its speed would rise dangerously high as the flux becomes very small

(B) its field winding would overheat because of excessive field current

(C) its armature current would become excessive because no back emf develops

(D) its torque would reverse direction because of the residual pole flux

Q.47 In an induction motor with slip s, the ratio of rotor copper loss to air-gap power is

(A) $\dfrac{s}{1 - s}$ **(B)** s **(C)** $\dfrac{1}{s}$ **(D)** $1 - s$

Q.48 An alternator is already connected to an infinite bus. If its steam input is increased with the excitation unchanged, the machine will

(A) raise its terminal voltage while the real power delivered stays the same

(B) deliver more real power with the same load angle, while bus frequency rises

(C) run faster than synchronous speed with the load angle unchanged

(D) deliver more real power by raising its load angle, with frequency unchanged

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Q.49 A 50 Hz single-phase transformer has a maximum core flux of 0.05 Wb. The number of secondary turns needed to induce 444 V is

(A) 178 **(B)** 40 **(C)** 400 **(D)** 28

Q.50 In an open-circuit test on the low-voltage side, a transformer takes 100 W and 1.2 A at its rated 230 V. The core-loss resistance R_c is approximately

(A) 423 Ω **(B)** 206 Ω **(C)** 529 Ω **(D)** 192 Ω

Q.51 A DC shunt motor runs at 1000 rpm with armature current 20 A and back emf 210 V from a 220 V supply. The field flux is reduced by 20% while the armature current stays unchanged. The new speed is approximately

(A) 1250 rpm **(B)** 1000 rpm **(C)** 1563 rpm **(D)** 800 rpm

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Q.52 In a Swinburne test on a DC shunt machine at 200 V, the no-load line current is 4 A and the field current is 1 A. The armature resistance is 0.5 Ω. The armature current at which the efficiency is maximum is approximately

(A) 56 A **(B)** 80 A **(C)** 25 A **(D)** 40 A

Q.53 The main advantage of a stepper motor for position control is

(A) open-loop positioning, since each input pulse gives a fixed step angle

(B) variable step angle, since it depends on the load torque applied

(C) continuous speed control, since shaft speed is independent of the pulse rate

(D) high starting torque, since the rotor winding is fed through slip rings

Power Systems

Q.54–59 | 6 questions

Q.54 A three-phase system carries current only in phase a, with $I_a = 30$ A and $I_b = I_c = 0$. The negative-sequence current of phase a is

(A) 30 A **(B)** 17.3 A **(C)** 0 A **(D)** 10 A

Q.55 A shunt capacitor connected near the load end of a distribution feeder improves the voltage mainly by

(A) absorbing reactive power from the line, increasing reactive current and voltage drop

(B) reducing the line resistance, so the real power loss in the feeder falls to zero

(C) supplying lagging reactive power locally, reducing reactive current and voltage drop

(D) raising the system frequency, so the inductive reactance of the feeder line falls

Q.56 A generator has a reactance of 0.2 pu on a 50 MVA, 11 kV base. Its reactance on a 100 MVA, 11 kV base is

(A) 0.8 pu **(B)** 0.4 pu **(C)** 0.1 pu **(D)** 0.2 pu

Q.57 Two generating units have fuel costs $C_1 = 0.05P_1^2 + 20P_1$ and $C_2 = 0.1P_2^2 + 16P_2$ in Rs/h, with P in MW. Ignoring losses and limits, the economic share of unit 1 for a total demand of 100 MW is

(A) 46.7 MW **(B)** 53.3 MW **(C)** 40.0 MW **(D)** 50.0 MW

Q.58 A hydro power station operates with a discharge of 20 m^3/s, a net head of 60 m and an overall efficiency of 90%. The electrical power output is approximately

(A) 9.5 MW **(B)** 1.06 MW **(C)** 11.8 MW **(D)** 10.6 MW

Q.59 A short three-phase line has a series impedance of $(2+j5)\,\Omega$ per phase. It delivers 400 A per phase at 0.8 lagging power factor with a receiving-end phase voltage of 20 kV. The sending-end phase voltage is approximately

(A) 19.55 kV **(B)** 22.15 kV **(C)** 21.87 kV **(D)** 21.84 kV

Switchgear and Protection

Q.60 | 1 question

Q.60 The breaking capacity of a three-phase circuit breaker in MVA is equal to

(A) $\sqrt{3}\times$ rated line voltage $\times$ rated symmetrical breaking current

(B) $\sqrt{3}\times$ rated line voltage $\times$ rated normal current of the breaker

(C) $3\times$ rated line voltage $\times$ rated symmetrical breaking current

(D) $\sqrt{3}\times$ rated line voltage $\times$ rated making current of the breaker

Get the Answers with Explanations

RVUNL JE Electrical 2026 Mock Test 1

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