BunkPoint MOCK TEST

NCRTC Supervisor (Electrical) 2026 Mock Test 1

Total Questions: **60** | Sections: **4**

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Electrical Machines

Q.1–24 | 24 questions

Q.1 A 6-pole, three-phase stator winding is supplied at 50 Hz. The speed of its rotating magnetic field is:

(A) 1000 rpm **(B)** 3000 rpm **(C)** 500 rpm **(D)** 1500 rpm

Q.2 In a capacitor-start single-phase induction motor, the capacitor in series with the auxiliary winding is used to:

(A) Raise the rotor speed above synchronous speed during the start-up period

(B) Reduce the stator iron loss by lowering the air-gap flux at starting

(C) Create a phase shift between the two winding currents to give starting torque

(D) Limit the starting current by adding a series resistance to the main winding

Q.3 A single-phase motor has a salient-pole rotor with no winding and no permanent magnets, and runs at constant synchronous speed. It is a:

(A) Reluctance motor **(B)** Universal motor

(C) Shaded-pole motor **(D)** Repulsion motor

Q.4 In a brushless DC (BLDC) motor, commutation is achieved by:

(A) Slip rings connecting the rotor winding to an external resistance

(B) Electronic switching of stator currents using rotor position feedback

(C) A centrifugal switch that opens when the rotor reaches rated speed

(D) A mechanical commutator with carbon brushes mounted on the stator

Q.5 A DC shunt generator fails to build up its voltage. Which of the following is a possible cause?

(A) The generator is driven above its rated speed during build-up

(B) Field circuit resistance is below the critical resistance for the speed

(C) Field circuit resistance exceeds the critical resistance for the speed

(D) The brushes are set exactly on the geometric neutral axis

Q.6 In an unsaturated DC series motor, the torque developed is proportional to:

(A) $\frac{1}{I_a}$ **(B)** I_a^2 **(C)** $\sqrt{I_a}$ **(D)** I_a

Q.7 In a DC machine, the compensating winding placed in the pole-face slots is connected:

(A) In series with the armature, carrying current in the same direction as nearby armature conductors

(B) In parallel with the field, carrying current opposite to nearby armature conductors

(C) In series with the armature, carrying current opposite to nearby armature conductors

(D) In parallel with the armature, carrying current in the same direction as nearby armature conductors

Q.8 A 6-pole simplex lap-wound DC generator delivers a total armature current of 300 A. The current in each parallel path is:

(A) 150 A **(B)** 100 A **(C)** 75 A **(D)** 50 A

Q.9 A DC generator has constant losses of 1.6 kW and a full-load armature copper loss of 1.0 kW. Its efficiency is maximum at a load current, as a fraction of full-load current, of:

(A) 1.60 **(B)** 1.26 **(C)** 0.62 **(D)** 0.79

Q.10 The main purpose of a starter for a DC motor is to:

(A) Limit the large starting armature current until the back emf builds up

(B) Increase the field flux above its rated value at the instant of starting

(C) Reduce the no-load speed of the motor after it has reached full speed

(D) Raise the supply voltage across the armature during the starting period

Q.11 In a differential compound DC motor, the series field flux:

(A) Acts at right angles to the shunt field flux at every load current

(B) Comes from a separate source and does not vary with the load current

(C) Aids the shunt field flux, so speed falls sharply as the load increases

(D) Opposes the shunt field flux, so speed may rise as the load increases

Q.12 Swinburne's (no-load) test on a DC shunt machine is used to determine:

(A) Armature reaction, by measuring the brush shift needed at full load

(B) Starting torque, by locking the armature at the rated voltage

(C) Constant losses, so efficiency can be predicted at any load

(D) Temperature rise, by running the machine at full load for several hours

Q.13 The air-gap (rotor input) power of a 3-phase induction motor is 20 kW at a slip of 4%. The rotor copper loss is:

(A) 0.8 kW **(B)** 4.0 kW **(C)** 0.83 kW **(D)** 19.2 kW

Q.14 If the supply voltage to a 3-phase induction motor falls by 10% at constant frequency, the starting torque falls to approximately:

(A) 90% of its original value **(B)** 64% of its original value

(C) 73% of its original value **(D)** 81% of its original value

Q.15 A 4-pole, 50 Hz induction motor runs at 1440 rpm. The frequency of the rotor currents is:

(A) 0.04 Hz **(B)** 4 Hz **(C)** 2 Hz **(D)** 48 Hz

Q.16 In star-delta starting of a 3-phase induction motor, the starting line current compared with direct-on-line starting is:

(A) $\frac{1}{\sqrt{3}}$ **(B)** 3 times **(C)** $\frac{1}{3}$ **(D)** $\frac{1}{2}$

Q.17 A 3-phase induction machine connected to a supply works as a generator when:

(A) The rotor runs above synchronous speed, giving negative slip

(B) The rotor runs below synchronous speed, giving positive slip

(C) The rotor runs in the reverse direction, giving slip above one

(D) The rotor runs at synchronous speed, giving zero slip

Q.18 Neglecting resistance, the power delivered by a cylindrical-rotor synchronous generator to an infinite bus is proportional to:

(A) $\tan\delta$ **(B)** $\sin\delta$ **(C)** $\cos\delta$ **(D)** $\sin 2\delta$

Q.19 Which method of finding the voltage regulation of an alternator gives the highest (most pessimistic) value?

(A) ASA method **(B)** MMF (Ampere-turn) method

(C) ZPF (Potier) method **(D)** EMF (synchronous impedance) method

Q.20 Which condition is mandatory for two single-phase transformers to be connected in parallel?

(A) Identical cooling method of the two units

(B) Identical kVA ratings of the two units

(C) Identical core dimensions of the two units

(D) Matching polarity of the terminals joined

Q.21 In the vector group Dyn11 of a three-phase transformer, the designation indicates:

(A) Star HV, delta LV with neutral brought out, LV leads HV by 30°

(B) Delta HV, star LV with neutral brought out, LV leads HV by 30°

(C) Star HV with neutral, delta LV, LV lags HV by 30°

(D) Delta HV, star LV with neutral brought out, LV lags HV by 30°

Q.22 Transformer cores are built from thin insulated laminations of silicon steel mainly to reduce:

(A) Eddy current loss **(B)** Mechanical vibration

(C) Copper loss **(D)** Dielectric loss

Q.23 A transformer has per-unit resistance 2% and reactance 4%. The approximate voltage regulation at full load with 0.8 power factor lagging is:

(A) 5.6% **(B)** 2.4% **(C)** -0.8% **(D)** 4.0%

Q.24 A distribution transformer has an iron loss of 200 W and a full-load copper loss of 400 W. It supplies full load for 6 hours a day and is on no load for the remaining 18 hours. The energy lost per day is:

(A) 9.6 kWh **(B)** 7.2 kWh **(C)** 3.6 kWh **(D)** 4.8 kWh

Power Systems

Q.25–38 | 14 questions

Q.25 Which hydraulic turbine is best suited to a very high head and low discharge?

(A) Kaplan turbine **(B)** Propeller turbine

(C) Francis turbine **(D)** Pelton wheel

Q.26 In a steam power plant, the economiser is used to:

(A) Heat the combustion air supplied to the furnace using exhaust gases

(B) Remove dissolved oxygen and gases from the boiler feed water

(C) Preheat the boiler feed water using heat from the flue gases

(D) Raise steam temperature above saturation temperature using flue gases

Q.27 Reheating steam between turbine stages in a thermal power plant mainly:

(A) Lowers the condenser vacuum needed for the exhaust steam

(B) Reduces the ash content carried over from the coal furnace

(C) Raises the boiler pressure rating of the steam generating unit

(D) Reduces the moisture content in the last stages of the turbine

Q.28 A hydroelectric plant works with a net head of 50 m and a discharge of 20 m^3/s. With an overall efficiency of 80%, the electrical output is approximately:

(A) 9.81 MW **(B)** 78.5 MW **(C)** 7.85 MW **(D)** 6.28 MW

Q.29 In a power system, the plant best suited to supply the base load is a:

(A) Large thermal power plant **(B)** Pumped storage plant

(C) Gas turbine plant **(D)** Diesel engine plant

Q.30 A power station has a maximum demand of 50 MW and generates 840 MWh in a day. Its daily load factor is:

(A) 84% **(B)** 70% **(C)** 16.8% **(D)** 35%

Q.31 Which gas used in circuit breakers is electronegative and has a dielectric strength about two to three times that of air at atmospheric pressure?

(A) Sulphur hexafluoride **(B)** Argon

(C) Nitrogen **(D)** Hydrogen

Q.32 In a three-phase transmission system, the most frequent type of fault is:

(A) Three-phase symmetrical fault **(B)** Single line-to-ground fault

(C) Line-to-line fault **(D)** Double line-to-ground fault

Q.33 In differential protection of a star-delta power transformer, the current transformers on the star side and the delta side are connected respectively in:

(A) Star and delta **(B)** Delta and star

(C) Delta and delta **(D)** Star and star

Q.34 A transmission line span is 200 m. The conductor weighs 1.5 kg per metre and the working tension is 1800 kg. The sag is approximately:

(A) 33.3 m **(B)** 2.08 m **(C)** 4.17 m **(D)** 8.33 m

Q.35 Compared with a radial distribution system, a ring main system provides:

(A) Lower fault level because a single source feeds each load

(B) Better continuity, as each load can be fed from two sides

(C) Lower initial cost because of shorter total feeder length

(D) Simpler protection because current flows in one direction only

Q.36 A short three-phase line has $R = 2\,\Omega$ and $X = 4\,\Omega$ per phase. A load takes 100 A per phase at 0.8 power factor lagging. The approximate voltage drop per phase is:

(A) 400 V **(B)** 447 V **(C)** 600 V **(D)** 440 V

Q.37 For a given power transmitted over a line, increasing the transmission voltage:

(A) Reduces the insulation cost of the line at the higher voltage level

(B) Increases the voltage drop in the line when measured in volts

(C) Increases the line current but reduces the conductor weight required

(D) Reduces the line current and hence the copper loss in the conductors

Q.38 Corona loss on an overhead transmission line is reduced by:

(A) Using bundled conductors with a larger effective diameter

(B) Reducing the spacing between the phase conductors of the line

(C) Operating the line at a higher altitude where air density is lower

(D) Using a smaller conductor diameter at the same line voltage

Basic Electronics and Measurement

Q.39–49 | 11 questions

Q.39 The Boolean expression $Y = A + \overline{A}B$ simplifies to:

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

Q.40 Which pair of gates is known as universal gates?

(A) NAND and NOR **(B)** XOR and XNOR **(C)** NOT and AND **(D)** AND and OR

Q.41 The sum output of a half adder with inputs A and B is given by:

(A) $A \cdot B$ **(B)** $A + B$ **(C)** $A \oplus B$ **(D)** $\overline{A \oplus B}$

Q.42 A JK flip-flop with $J = K = 1$ will, on each active clock pulse:

(A) Set its output to logic 1 regardless of the earlier state

(B) Reset its output to logic 0 regardless of the earlier state

(C) Toggle its output to the opposite of the earlier state

(D) Hold its previous output state without any change

Q.43 A PMMC (permanent magnet moving coil) instrument can be used directly to measure:

(A) Both ac and dc quantities equally **(B)** Power in single-phase ac circuits

(C) Direct current and direct voltage **(D)** Alternating current and voltage

Q.44 A Megger-type earth tester is primarily used to measure the:

(A) Insulation resistance of a motor winding

(B) Continuity of the conductors in a cable

(C) Leakage current of an earth leakage breaker

(D) Resistance of an earth electrode in soil

Q.45 In an induction type energy meter, 'creeping' refers to the:

(A) Slowing of the disc at heavy loads due to the braking magnet

(B) Reversal of disc rotation when the connected load is inductive

(C) Stopping of the disc at very small loads due to friction

(D) Slow continuous rotation of the disc with no load current flowing

Q.46 A clamp-on ammeter measures current by:

(A) Inserting a low-value shunt in series by cutting the conductor

(B) Sensing the magnetic field around the conductor without breaking it

(C) Comparing the conductor temperature with a reference sensor

(D) Measuring the voltage drop across a known resistor in the line

Q.47 A voltmeter of resistance 50 kΩ is connected across one of two 50 kΩ resistors that are in series across a 100 V DC source. The voltmeter reads:

(A) 33.3 V **(B)** 50 V **(C)** 25 V **(D)** 40 V

Q.48 The Hall voltage developed across a semiconductor strip is proportional to:

(A) The current alone, independent of the magnetic flux density

(B) The ratio of the current to the magnetic flux density

(C) The flux density alone, independent of the current

(D) The product of the current and the magnetic flux density

Q.49 Adding a pentavalent impurity such as phosphorus to pure silicon produces:

(A) n-type semiconductor with electrons as majority carriers

(B) p-type semiconductor with electrons as majority carriers

(C) p-type semiconductor with holes as majority carriers

(D) n-type semiconductor with holes as majority carriers

Circuit Theory and Basic Electrical Engineering

Q.50–60 | 11 questions

Q.50 A load draws 6 kW and 8 kVAR (lagging) from an ac supply. Its power factor is:

(A) 0.75 lagging **(B)** 0.6 lagging **(C)** 0.6 leading **(D)** 0.8 lagging

Q.51 For a balanced star-connected three-phase load, the relations between line and phase quantities are:

(A) $I_L = \sqrt{3}\, I_{ph}$ and $V_L = \sqrt{3}\, V_{ph}$ **(B)** $I_L = I_{ph}$ and $V_L = \sqrt{3}\, V_{ph}$

(C) $I_L = I_{ph}$ and $V_L = V_{ph}$ **(D)** $I_L = \sqrt{3}\, I_{ph}$ and $V_L = V_{ph}$

Q.52 A parallel resonant circuit has an inductor $L = 1\,\text{mH}$ with series resistance $R = 1\,\Omega$ in parallel with $C = 10\,\mu\text{F}$. The approximate quality factor at resonance is:

(A) 10 **(B)** 62.8 **(C)** 100 **(D)** 1

Q.53 The eddy current loss in a magnetic core varies with supply frequency f and maximum flux density B_m as:

(A) $f^2 B_m$ **(B)** $f B_m^{1.6}$ **(C)** $f B_m^2$ **(D)** $f^2 B_m^2$

Q.54 A magnetic circuit has an iron path of 50 cm with $\mu_r = 1000$ and an air gap of 1 mm, both of the same cross-section. The fraction of the total mmf required for the air gap is approximately:

(A) 33.3% **(B)** 50% **(C)** 99.9% **(D)** 66.7%

Q.55 The energy stored in a 0.2 H inductor carrying a steady current of 5 A is:

(A) 5 J **(B)** 1 J **(C)** 2.5 J **(D)** 0.5 J

Q.56 The hysteresis loss per cycle in a magnetic material is proportional to:

(A) The remanent flux density of the material

(B) The saturation flux density of the material

(C) The area enclosed by the B-H loop of the material

(D) The coercive force value of the material

Q.57 A source of emf 24 V and internal resistance 4 Ω supplies a variable load resistance. The maximum power that can be delivered to the load is:

(A) 72 W **(B)** 144 W **(C)** 36 W **(D)** 18 W

Q.58 A 2 kW heater runs for 5 hours a day for 30 days. At Rs. 8 per unit, the energy cost is:

(A) Rs. 4800 **(B)** Rs. 2400 **(C)** Rs. 1200 **(D)** Rs. 480

Q.59 A series RL circuit with $R = 10\,\Omega$ and $L = 0.5$ H is connected to a DC supply. Its time constant is:

(A) 0.05 s **(B)** 5 s **(C)** 20 s **(D)** 0.5 s

Q.60 In a Wheatstone bridge, arms $P = 100\,\Omega$, $Q = 200\,\Omega$ and $R = 300\,\Omega$ are known. The bridge balances when the unknown arm S is:

(A) 300 Ω **(B)** 66.7 Ω **(C)** 150 Ω **(D)** 600 Ω

Get the Answers with Explanations

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