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UPPSC-2021

UTTAR PRADESH

PUBLIC SERVICE COMMISSION 2021

Assistant Engineer

Electrical Engineering

PAPER-II

Exam held on 29-05-2022

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Questions and Answer Keys

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Q.1 Which of the following are the exclusive powers of the Lok Sabha ?

1. To introduce the Money Bill.
2. To ratify the declaration of emergency.
3. To pass a motion of no confidence against the Council of Ministers.
4. To impeach against the President.

Choose the correct answer from the code given below:

Codes:

(a) 1 and 3 (b) 1 and 4
(c) 3 and 4 (d) 2 and 3

Ans. (a)

Q.2 Which of the following sea is situated between Philippines and Vietnam ?

(a) Philippines Sea
(b) Celebes Sea
(c) South China Sea
(d) East China Sea

Ans. (c)

Q.3 The provision for Anti Defection Act is mentioned in which of the following Schedules of the Constitution of India ?

(a) 9^{th} (b) 12^{th}
(c) 11^{th} (d) 10^{th}

Ans. (d)

Q.4 With reference to the Vikramshila University which of the following statements is/are correct?

1. Vikramshila was one of the most important centre of learning in India during the Pala period.
2. Rakshit, Virochan, Ateesh, Deepankar and Ratnakar Shanti were very important Acharya of Vikramshila University.

Select the correct answer using the code given below:

Code :

(a) Only 1 (b) Neither 1 nor 2
(c) Both 1 and 2 (d) Only 2

Ans. (c)

Q.5 What was the theme of the 40^{th} Indian International Trade Fair held in November, 2021?

(a) Atmanirbhar Bharat
(b) Vocal for Local
(c) Is of Doing Business
(d) None of the above

Ans. (a)

Q.6 With reference to National Ayurveda Day 2021, which of the following statement is/are correct?

1. It was celebrated on 23^{rd} October, 2021.
2. It's theme was 'Ayurveda for Poshan'.

Select the correct answer from the code given below:

(a) 1 only (b) Neither 1 nor 2
(c) both 1 and 2 (d) 2 only

Ans. (d)

Q.7 In which of the following Puranas, the five characteristics of the Puranas are mentioned ?

(a) Vaman (b) Matsya
(c) Vayu (d) Vishnu

Ans. (b)

Q.8 By which Constitutional Amendment 'Part IX B' was added in the Indian Constitution ?

(a) 52^{nd} Constitutional Amendment
(b) 97^{th} Constitutional Amendment
(c) 93^{rd} Constitutional Amendment
(d) 73^{rd} Constitutional Amendment

Ans. (b)

Q.9 Which one of the following States is a leading producer of diamonds in India?
(a) Telangana
(b) Karnataka
(c) Madhya Pradesh
(d) Odisha

Ans. (c)

Q.10. In India, the voting age was lowered from 21 to 18 years by which of the following Constitutional Amendment ?
(a) 56^{th} (b) 88^{th}
(c) 72^{nd} (d) 61^{st}

Ans. (d)

Q.11 Knock-Knee syndrome results due to Pollution of
(a) Heavy metal (b) Phosphate
(c) Fluorides (d) Nitrate

Ans. (c)

Q.12 Baltic Republics do NOT include which of the following ?
1. Denmark 2. Estonia
3. Finland 4. Latvia

Select the correct answer using the code given below.
Code:
(a) 1 and 2 (b) 2 and 4
(c) 2 and 3 (d) 1 and 3

Ans. (d)

Q.13 Which French traveller called Kashi as 'Athens of India'.
(a) Thevenot (b) Manucci
(c) Tavernier (d) Bernier

Ans. (d)

Q.14 Which of the following App is introduced by the Election Commission of India in October, 2021 for digital mapping of all polling stations?
(a) Arjun App (b) Chatbot App
(c) Trishul App (d) Garuda App

Ans. (d)

Q.15 Match **List-I (Blue Flag Certified Beach)** with **List-II (Location)** and select the correct answer using the code given below.

List-I	List-II
A. Ghoghla	1. Andhra Pradesh
B. Kasarkod	2. Kerala
C. Kappad	3. Karnataka
D. Rushikonda	4. Diu

Code:

	A	B	C	D
(a)	4	3	1	2
(b)	3	4	2	1
(c)	3	4	2	1
(d)	3	4	1	2

Ans. (b)

Q.16 Match **List-I (Code)** with **List-II (Year of Introduction)** and select the correct answer using the code given below.

List-I	List-II
A. Code of Civil Procedure	1. 1862
B. Indian Penal Code	2. 1859
C. Criminal Procedure Code	3. 1861
D. Police Act	4. 1860

Code:

	A	B	C	D
(a)	2	4	1	3
(b)	3	4	2	1
(c)	2	3	4	1
(d)	4	1	2	3

Ans. (a)

Q.17 Which of the following pairs represent units of the same physical quantity.
(a) Kelvin and Joule
(b) Newton and Calorie
(c) Kelvin and Calorie
(d) Joule and Calorie

Ans. (d)

Q.18 Which of the following Article makes provision that "the law declared by the Supreme Court shall be binding on all the Courts within the territory of India"?
(a) Article 140 (b) Article 143
(c) Article 142 (d) Article 141

Ans. (d)

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Q.19 With reference to Delhi Sultanate consider the following statements.

1. Sultangarhi was built by Sultan Iltutmish.
2. Located in Delhi, it is the first tomb built by Turks.

Select the correct answer using the code given below :

Code:

(a) Only 1
(b) Neither 1 nor 2
(c) Both 1 and 2
(d) Only 2

Ans. (c)

Q.20 In which of the following States of India 'Chitrakote waterfall' is located?

(a) Uttar Pradesh (b) Jharkhand
(c) Chhattisgarh (d) Madhya Pradesh

Ans. (c)

Q.21 Who among the following is the Chairperson of GST Council?

(a) President
(b) Deputy Chairman of NITI Ayog
(c) Union Finance Minister
(d) Prime Minister

Ans. (c)

Q.22 What is the rank of India in 'Global Food Security Index, 2021'?

(a) 54 (b) 83
(c) 71 (d) 62

Ans. (c)

Q.23 In the battle of Chandawar (1194 CE) King Jaichand was defeated by Muhammad Gori. Present geographical location of Chandawar is

(a) Etawah district in U.P. at the bank of river Yamuna
(b) Varanasi, U.P. at the bank of river Ganga
(c) Kannauj, U.P. at the bank of river Yamuna
(d) Prayagraj district in U.P. at the bank of river Yamuna

Ans. (a)

Q.24 Match **List-I** with **List-II** and select the correct answer using the code given below.

List-I	List-II
A. Acetic acid	1. Ant's sting
B. Lactic acid	2. Spinach
C. Formic acid	3. Vinegar
D. Oxalic acid	4. Curd

Code:

	A	B	C	D
(a)	1	2	3	4
(b)	3	4	1	2
(c)	4	3	2	1
(d)	2	4	1	3

Ans. (b)

Q.25 Which one of the following is NOT correctly matched?

(a) Shaukat Usmani – Kanpur Conspiracy Case
(b) Khudiram Bose – Assembly Bomb case
(c) Ashfaqullah Khan – Kakori Train Robbery Case
(d) Surya Sen – Chatgaon Revolt Case

Ans. (b)

Q.26 Find average output dc voltage of a single-phase semi-converter with $V_s = 230$ V and firing angle of 30°. The converter is operating under continuous conduction.

(a) 193 V (b) 230 V
(c) 0 V (d) 256 V

Ans. (a)

Q.27 Consider the following statements:

1. Inherent four quadrant operation capability.
2. Voltage spikes across the load.
3. Fast dynamic response.
4. Need for converter grade thyristors.

Which of these features are associated with a current source inverter?

(a) 1, 2 and 4 (b) 1, 2 and 3
(c) 2, 3 and 4 (d) 1, 3 and 4

Ans. (c)

Q.28 The restriking voltage is measured in
(a) RMS value
(b) Average value
(c) Instantaneous value
(d) Peak value

Ans. (d)

Q.29 The highest priority in 8085 microprocessor is
(a) RST 7.5 (b) TRAP
(c) INTR (d) RST 6.5

Ans. (b)

Q.30 The modulation index of an AM wave is changed from 0 to 1. The transmitted power is
(a) Unchanged
(b) Quadrupled
(c) Increases by 50%
(d) Doubled

Ans. (c)

Q.31 A three-phase, 33 KV oil circuit breaker is rated 1200 A, 2000 MVA, 3 sec. The symmetrical breaking current is
(a) 1200 A (b) 104.8 KA
(c) 35 KA (d) 3600 A

Ans. (c)

Q.32 What would be the backward field slip of a single phase induction motor running at N rpm when it is given that synchronous speed is N_s and slip S with respect to forward field?
(a) S (b) $(2 - S)$
(c) $(1 - S)$ (d) $-S$

Ans. (b)

Q.33 The radiation resistance of a circular loop of one turn is 0.01 Ω. The radiation resistance of five turns of such a loop will be
(a) 0.002 Ω (b) 0.25 Ω
(c) 0.05 Ω (d) 0.01 Ω

Ans. (b)

Q.34 The reflection coefficient at the open circuit end of a transmission line is
(a) Unity (b) Zero
(c) Infinity (d) None of the above

Ans. (a)

Q.35 Power supply to a 10-pole three phase induction motor is supplied by 4-pole three phase alternator which is driven at 1500 rpm. If motor runs with a slip of 4%, what is the speed?
(a) 240 rpm (b) 750 rpm
(c) 600 rpm (d) 576 rpm

Ans. (d)

Q.36 Among the following bonds which one is the weakest?
(a) Covalent bond (b) Metallic bond
(c) Hydrogen bond (d) Ionic bond

Ans. (c)

Q.37 Consider following power semiconductor devices:
1. TRIAC
2. MOSFET
3. Power Transistor
4. Insulated Gate Bipolar Transistor (IGBT)

Out of these devices, voltage controlled devices are
(a) 1 and 2 (b) 3 and 4
(c) 2 and 4 (d) 2 and 3

Ans. (c)

Q.38 If the rotor of a 3-phase induction motor assumed purely resistive, then electromagnetic torque in the motor is
(a) minimum with load angle 0°
(b) optimum with load angle 0°
(c) optimum with load angle 90°
(d) minimum with load angle 90°

Ans. (c)

Q.39 A squirrel cage induction motor having slip of 4% on full load has a starting torque same as the full load torque. Which of the following statement is correct?
The starting current is
(a) equal to full load current
(b) five times the full load current
(c) four times the full load current
(d) twice the full load current

Ans. (b)

Q.40 If the *J*-input of a *J-K* flip-flop is treated as input and an inverter is connected between J and K inputs, the J-K flip-flop becomes
(a) R-S flip-flip (b) D latch
(c) T flip-flop (d) D flip-flop

Ans. (b)

Q.41 Logic gates required to build up a half adder circuit are
(a) EX-OR gate and NOR gate
(b) EX-NOR gate and NAND gate
(c) EX-OR gate and AND gate
(d) EX-OR gate and OR gate

Ans. (c)

Q.42 Consider following statements:
The overlap angle of single phase fully controlled bridge converter would increase an increasing
1. Supply voltage
2. Supply frequency
3. Load current
4. Source inductances

Of these statements
(a) 1, 2 and 3 are correct
(b) 1, 3 and 4 are correct
(c) 1, 2 and 4 are correct
(d) 2, 3 and 4 correct

Ans. (c)

Q.43 **Assertion (A) :** Inverters and choppers use fast switching thyristors.
Reason (R) : Fast switching SCR has low turn-off time.
(a) Both (A) and (R) are correct and (R) is correct explanation of (A).
(b) (A) is wrong but (R) is correct.
(c) (A) is correct but (R) is wrong.
(d) Both (A) and (R) are correct but (R) is not correct explanation of (A).

Ans. (a)

Q.44 The Boolean $AB + AC$ is equivalent to
(a) $AB + AC + BC$
(b) $ABC + ABC' + AB'C$
(c) $ABC + A'BC + B'C'$
(d) $A'B'C' + ABC' + A'BC$

Ans. (b)

Q.45 In a DRAM
(a) Periodic refreshing is not required.
(b) Both READ and WRITE operations can be performed simultaneously.
(c) Information is stored in a latch.
(d) Information is stored in a capacitor.

Ans. (b, d)

Q.46 The current zero interruption in oil and air blast circuit breaker is achieved by
(a) cooling and blast effect
(b) deionizing the oil with forced air
(c) longthening of the gap
(d) both (a) and (c)

Ans. (d)

Q.47 To analyse the performance of single phase induction motor, which theories are to be used?
(a) Only double-revolving field theory
(b) Only cross-field theory
(c) Pulsating field theory
(d) Both (a) and (b)

Ans. (d)

Q.48 Over fluxing protection is recommended for
(a) Distribution transformer
(b) Station-transformer of the power plant
(c) Auto-transformer of the power plant
(d) Generator-transformer of the power plant

Ans. (d)

Q.49 The resistance of the arc may be increased by
i. increasing the length
ii. cooling the arc
iii. increasing cross-sectional area of the arc
iv. Splitting the arc

Select the correct option:
(a) i, ii, iii are correct
(b) ii, iii are correct
(c) i, ii, iv are correct
(d) ii, iii, iv are correct

Ans. (c)

Q.50 In the communication system, noise is most likely to affect the signal
(a) At the receiver
(b) In the channel
(c) At the transmitter
(d) Both (a) and (b)

Ans. (b)

Q.51 A step down chopper has V_s as a source voltage, α is the duty ratio and R is the load resistance. The rms value of output voltage is
(a) $\sqrt{\alpha}\, V_s$ (b) $\sqrt{1-\alpha}\, V_s$
(c) $\frac{V_s}{\sqrt{\alpha}}$ (d) αV_s

Ans. (a)

Q.52 The range of signed decimal number that can be represented by a 6-bit 1's complement number is
(a) –31 to +31 (b) –32 to +31
(c) –64 to +64 (d) –63 to +63

Ans. (a)

Q.53 Roots of the algebraic equation
$x^3 + x^2 + x + 1 = 0$ are
(a) $(+1, +j, -j)$ (b) $(-1, +j, -j)$
(c) (0, 0, 0) (d) $(+1, -1, -1)$

Ans. (b)

Q.54 Consider following distance relays used for transmission line protection.
1. Impedance relay
2. Reactance relay
3. MHO relay
4. Quadrilateral relay

Out of these relays no under reach on arcing faults in
(a) 1 and 2 (b) 1 and 4
(c) 2 and 3 (d) 2 and 4

Ans. (d)

Q.55 The packing fraction of a BCC (Body Centred Cubic) unit cell is
(a) $\frac{\sqrt{3}\pi}{16}$ (b) $\frac{\sqrt{2}\pi}{8}$
(c) $\frac{\sqrt{3}\pi}{12}$ (d) $\frac{\sqrt{3}\pi}{8}$

Ans. (d)

Q.56 A 3-phase induction motor has following stator and rotor parameters:
$R_s = R_r' = 1\,\Omega,\ X_s = X_r' = 2\,\Omega$
The slip corresponding to the maximum torque is given by approximately
(a) 0.24 (b) 0.34
(c) 0.30 (d) 0.28

Ans. (a)

Q.57 Superconductor are becoming popular for use in
(a) generating a very strong magnetic field
(b) generating regions free from magnetic field
(c) generating electrostatic field
(d) manufacture of bubble memories

Ans. (a)

Q.58 A surge of 100 kV travels along an overhead line towards the junction with a cable. The surge impedance of the overhead line and cable are 400 Ω and 50 Ω respectively. The magnitude of the surge transmitted through the cable is
(a) 11.11 kV (b) 88.89 kv
(c) 12.50 kV (d) 22.22 kV

Ans. (d)

Q.59 The clock frequency of 8085 microprocessor is 5 MHz. If the time required to execute an instruction is 1.4 microsecond, then the number of T-states needed for executing the instruction is
(a) 4 (b) 1
(c) 6 (d) 7

Ans. (d)

Q.60 Assuming other parameters unchanged, if the modulating frequency is halfed in a modulating systems, the modulation index is doubled, the modulation system is
(a) Amplitude modulation
(b) Pulse modulation
(c) Phase modulation
(d) Frequency modulation

Ans. (d)

Q.61 A 10 bit D/A converter gives a maximum output of 10.23 V. The resolution is
(a) 10 mV (b) 25 mV
(c) 15 mV (d) 20 mV

Ans. (a)

Q.62 Which of the following device incorporates a terminal for synchronising purpose?
(a) DIAC
(b) Silicon Unilateral Switch (SUS)
(c) TRIAC
(d) None of the above

Ans. (b)

Q.63 The absolute speed of magnetic field in space of a 3 ϕ rotor fed induction motor is
(a) synchronous speed N_s
(b) $(N_s + N_r)$
(c) $(N_s - N_r)$
(d) rotor speed N_r

Ans. (c)

Q.64 A 3-phase, 3-stack, variable reluctance motor has 20 poles on each rotor and stator stack. The step angle of this stepper motor is
(a) 3° (b) 18°
(c) 9° (d) 6°

Ans. (d)

Q.65 In solving ordinary differential equation $\frac{dy}{dx} = 2x$, $y(0) = 0$, using Euler's method, the iterate y_n, $n \in N$ satisfy
(a) $y_n = 2x_n$ (b) $y_n = x_n + x_{n-1}$
(c) $y_n = x_n x_{n-1}$ (d) $y_n = x_n^2$

Ans. (c)

Q.66 Which of the following statements applies to the bisection method used for finding roots of functions?
(a) Converges within a few iterations
(b) Requires that there can be no error in determining the sign of the function
(c) This is faster than *N-R* method
(d) Guaranteed to work for all continuous functions

Ans. (d)

Q.67 The structure sensitive property of a superconductor is
(a) critical magnetic field
(b) critical current density
(c) transition temperature
(d) none of the above

Ans. (b)

Q.68 In a four quadrant operation of an electric machine, the third quadrant operation is
(a) Forward braking
(b) Forward motoring
(c) Reverse motoring
(d) Reverse braking

Ans. (c)

Q.69 In a circular waveguide, the dominated mode is
(a) TE_{01} (b) TE_{21}
(c) TE_{20} (d) TE_{11}

Ans. (d)

Q.70 The *Q*-factor of a waveguide resonator is given by (ω_o is resonant frequency, U is energy storage and ω_L is power loss)
(a) $Q = \frac{\omega_o U}{\omega_L}$ (b) $Q = \frac{U\omega_L}{\omega_o}$
(c) $Q = \omega_o \omega_L U$ (d) $Q = \frac{\omega_o \omega_L}{U}$

Ans. (a)

Q.71 An induction generator
(a) takes reactive power from the mains and supplies active power to the mains
(b) consumes both active and reactive power from the mains
(c) supplies both active and reactive power to the mains
(d) takes active power from the mains and supplies reactive power to the mains

Ans. (a)

Q.72 The general solution of $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = 0$ is
(a) $y = c_1e^{3x} + c_2e^{-3x}$
(b) $y = (c_1 + c_2x)e^{3x}$
(c) $y = c_1e^{3x}$
(d) $y = (c_1 + c_2x)\, e^{-3x}$

Ans. (b)

Q.73 The voltage appearing across the contacts after the opening of the circuit breaker is called
(a) surge voltage (b) recovery voltage
(c) arc voltage (d) operating voltage

Ans. (b)

Q.74 What is root correct to three decimal places of the equation $x^3 - 3x - 5 = 0$ by using Newton-Raphson method?
(a) 2.223 (b) 2.224
(c) 2.288 (d) 2.279

Ans. (d)

Q.75 The transfer of a block of data from one set of memory address to another takes place in
(a) block transfer mode
(b) cascade mode
(c) memory to memory transfer mode
(d) demand transfer mode

Ans. (a)

Q.76 For a *R* firing circuit, the maximum value of source voltage is 1000 V. Find the resistance to be inserted to limit the anode current to 2 A.
(a) 5 Ω (b) 0.5 Ω
(c) 500 Ω (d) 50 Ω

Ans. (d)

Q.77 In a single-phase induction motor driving a fan load, the reason for having a high resistance rotor is to achieve
(a) Low starting torque
(b) Reduced size
(c) High efficiency
(d) Quick acceleration

Ans. (d)

Q.78 A 400 V, 50 Hz, 30 hp, three-phase induction motor is drawing 50 A current 0.8 power factor lagging. The stator and rotor copper losses are 1.5 kW and 900 W respectively. The friction and windage losses are 1050 W and the core losses are 1200 W. The air gap power of the motor will be
(a) 23.06 kW (b) 26.21 kW
(c) 25.01 kW (d) 24.11 kW

Ans. (c)

Q.79 A relay operates in 3 sec, when TMS = 0.7. A TMS is adjusted to 0.2, the operating time of relay is
(a) 0.67 sec (b) 0.456 sec
(c) 0.857 sec (d) 0.58 sec

Ans. (c)

Q.80 The rapid increase of dielectric strength of the medium and near current zero can be achieved by
i. lenghtening of the gap
ii. blast effect
iii. cooling
iv. decrease the pressure in the vicinity of the arc

Select correct option :
(a) i, ii, iv are correct
(b) i, iii, iv are correct
(c) ii, iii, iv are correct
(d) i, ii, iii are correct

Ans. (d)

Q.81 A 3 ϕ, 4-pole, 50 Hz induction motor runs at a speed of 1440 rpm

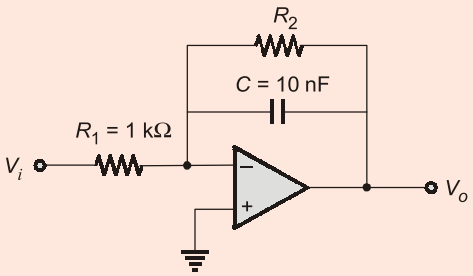
1. Its slip is 0.04.
2. Its rotor field rotates at 60 rpm with respect to rotor.
3. Its rotor field rotates at 60 rpm with respect to stator field.
4. Its rotor runs at a speed 60 rpm with respect to stator field.
5. Its rotor field rotates at a speed of 1500 rpm with respect to stator.

From these, the correct statements are :

(a) 1, 2, 4, 5 (b) 1, 2, 4
(c) 1, 2, 5 (d) 1, 2, 3, 4, 5

Ans. (c)

Q.82 In a low-pass filter shown in figure for a cut-off frequency of 5 kHz, the value of R_2 will be



(a) 3.33 kΩ (b) 3.60 kΩ
(c) 6.30 kΩ (d) 3.10 kΩ

Ans. (d)

Q.83 When both the input signals *A* and *B* of NAND gate are connected together, the output of the resultant circuit will be equivalent to

(a) OR (b) NOT
(c) AND (d) None of the above

Ans. (b)

Q.84 Choose the correct statement for dual converter :

(a) circulating current exists in both circulating and non-circulating current modes
(b) circulating current exists only in circulating current mode
(c) circulating current exists only in non-circulating current mode
(d) none of the above

Ans. (b)

Q.85 The main function of helix structure in a Travelling Wave Tube (TWT) is

(a) to reduce axial-velocity of RF field
(b) to reduce axial velocity of electron
(c) to properly focus electron beam
(d) to reduce noise figure of TWT

Ans. (a)

Q.86 Match **List-I** (Relay) with **List-II** (Protected power system component) and select the correct answer using the codes given below the lists.

List-I	List-II
A. Distance relay	1. Transformer
B. Under frequency relay	2. Turbine
C. Differential relay	3. Busbar
D. Buchholz relay	4. Shunt capacitor
	5. Alternator
	6. Transmission line

Codes :

	A	B	C	D
(a)	6	5	3	1
(b)	3	5	4	1
(c)	6	1	3	2
(d)	3	1	4	2

Ans. (a)

Q.87 When the temperature of a magnetic material is raised above the Curie point, it becomes

(a) Diamagnetic (b) Ferrimagnetic
(c) Ferromagnetic (d) Paramagnetic

Ans. (d)

Q.88 If the load on a squirrel cage induction motor operating on a constant voltage, constant frequency ac supply is increased, then

(a) power factor angle will increase and slip will decrease
(b) both power factor angle and slip will increase
(c) both power factor angle and slip will decrease
(d) power factor angle will decrease and slip will increase

Ans. (b)

Q.89 The value of x that satisfies $f(x) = 0$ is called the
(a) Root of an equation $f(x) = 0$
(b) Zero of an equation $f(x) = 0$
(c) Root of a function $f(x) = 0$
(d) None of the above

Ans. (a)

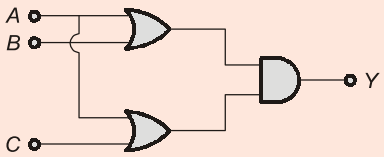
Q.90 The co-ordination number of a simple cubic structure is
(a) 2 (b) 8
(c) 6 (d) 4

Ans. (c)

Q.91 Snubber circuits are used with thyristors
(a) to see that SCR 'turns on' at a voltage much less than its forward breakdown voltage
(b) to limit the rate of rise of current $\frac{di}{dt}$
(c) to limit the rate of rise of voltage $\frac{dv}{dt}$
(d) to protect the gate circuit

Ans. (c)

Q.92 The output of given logic circuit is



(a) $A \cdot (B + C)$
(b) $A + B + C$
(c) $(A + B) \cdot (A + C)$
(d) $A \cdot (B \cdot C)$

Ans. (c)

Q.93 Which of the following device is used for modulation and demodulation?
(a) Multiplexer (b) Modem
(c) Gateway (d) Serial port

Ans. (b)

Q.94 Which of the following statement is correct?
If the channel bandwidth doubles, S/N ratio becomes
(a) Double of the former S/N ratio
(b) Half of the former S/N ratio
(c) Square root of the former S/N ratio
(d) None of these

Ans. (b)

Q.95 In 8085, which are 16-bit registers?
(a) only stack pointer and program counter
(b) accumulator, stack pointer and program counter
(c) program counter and accumulator
(d) stack pointer and accumulator

Ans. (a)

Q.96 A transmission line is short circuited at one end, then reflection coefficient and refraction coefficient are respectively
(a) 1, –1 (b) –1, 1
(c) –1, 0 (d) 1, 0

Ans. (b)

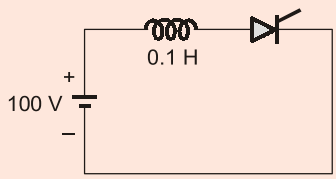
Q.97 8085 microprocessor has _____ individual flags during arithmetic and logic operations.
(a) 16 (b) 2
(c) 5 (d) 8

Ans. (c)

Q.98 At low value of slips, the torque in a 3 ϕ induction motor is given by
(V_1 = stator phase voltage)
(a) $Te \propto \frac{V_1^2}{r_2} \cdot s$ (b) $Te \propto \frac{V_1 \cdot s}{r_2}$
(c) $Te \propto V_1^2 r_2 (1 - s)$ (d) $Te \propto \frac{V_1^2 r_2}{s}$

Ans. (a)

Q.99 The latching current in the below circuit is 4 mA. The minimum width of the gate pulse required to turn on the thyristor is



(a) 6 μs (b) 1 μs
(c) 2 μs (d) 4 μs

Ans. (d)

Q.100 Which of the following relay has maximum stability on power swing?
(a) Impedance relay
(b) Quadrilateral relay
(c) MHO relay
(d) Reactance relay

Ans. (c)

Q.101 A RAM chip has a capacity of 1024 words of 8-bits each (1 K × 9). The number of (2 × 4) decoders with enable line needed to construct a (16K × 16) RAM from (1K × 8) RAM is
(a) 4 (b) 7
(c) 6 (d) 5

Ans. (a)

Q.102 The number of atoms per unit cell and the number of slip system respectively for FCC crystal are
(a) 3, 12 (b) 3, 9
(c) 4, 12 (d) 4, 16

Ans. (c)

Q.103 A 3 ϕ, 3 pulse converter would operate as a line communicated inverter when
(a) $30° < \alpha < 60°$
(b) it can never operate as a line
(c) $\alpha < 90°$
(d) $90° < \alpha < 180°$

Ans. (d)

Q.104 A single phase full-bridge converter with a free wheeling diode feeds an inductive load. The load resistance is 15.53 Ω and it has a large inductance providing constant and ripple free dc current. Input to converter is from an ideal 230 V, 50 Hz single phase source. For a firing delay of 60°, the average value of diode current is
(a) 10 A (b) 3.33 A
(c) 5.774 A (d) 8.165 A

Ans. (b)

Q.105 If the resolution of a digital-to-analog (D/A) converter is approximately 0.4% of its full scale range, then it is
(a) 8 bit converter (b) 16 bit converter
(c) 12 bit converter (d) 10 bit converter

Ans. (a)

Q.106 A 3-phase induction motor has starting torque of 100% and a maximum torque of 200% of full-load torque. The value of slip at which maximum torque occurs
(a) $S_m = 0.168$ (b) $S_m = 0.368$
(c) $S_m = 0.268$ (d) $S_m = 0.0718$

Ans. (c)

Q.107 In a stepper motor, the detent torque means
(a) minimum of the static torque with the phase winding excited
(b) maximum of the static torque with the phase winding unexcited
(c) minimum of the static torque with the phase winding unexcited
(d) maximum of the static torque with the phase winding excited

Ans. (a)

Q.108 The arcing contacts in a circular breaker are made of
(a) Copper tungsten
(b) Aluminium alloy
(c) Electrolytic copper
(d) Porcelain

Ans. (a)

Q.109 In respect of following voltage regulators select the option which one is correct?
(a) Buck regulator has voltage gain as K with negligible values of r_L and r_c
(b) Boost regulator has voltage gain as $\left(\frac{1-K}{2}\right)$ with negligible values of r_L and r_c
(c) Buck-boost regulator has voltage gain as $\left(\frac{K}{1-K}\right)$ with negligible value of r_L and r_c
(d) Only (b) and (c) are correct

Ans. (a, c)

Q.110 Which of the following metals has the lowest temperature coefficient of resistance?
(a) Gold (b) Kanthal
(c) Aluminium (d) Copper

Ans. (a)

Q.111 Mask programming is also known as
(a) EPROM
(b) Both EPROM and PROM
(c) Custom programming
(d) PROM

Ans. (c)

Q.112 At heavy loads more than break down power, the relation between torque (T) and slip (S) in three phase induction motor is given by

(a) $T \propto \frac{S}{1-S}$ (b) $T \propto \frac{1}{S}$
(c) $T \propto (1-S)$ (d) $T \propto S$

Ans. (b)

Q.113 What is the content of the accumulator of 8085 μP after execution XRIFOH instruction?
(a) only the lower nibble is complemented
(b) only the upper nibble of accumulator is complemented
(c) only the lower nibble is reset to zero
(d) only the upper nibble is reset to zero

Ans. (c)

Q.114 The bisection method is applied to compute a zero of the function $f(x) = x^4 - x^3 - x^2 - 4$ in the interval [1, 9]. The method converges to a solution after _____ iterations.
(a) 1 (b) 7
(c) 5 (d) 3

Ans. (d)

Q.115 In a 3-phase semi-converter, firing angle = 120° and extinction angle = 110°. each SCR and free wheeling diode conducts respectively for
(a) 30°, 50° (b) 30°, 40°
(c) 60°, 10° (d) 60°, 50°

Ans. (d)

Q.116 The Boolean function $Y = AB + CD$ is to be realized using only 2 input NAND gates. The minimum number of gates required is
(a) 2 (b) 5
(c) 4 (d) 3

Ans. (d)

Q.117 A microwave tube amplifier uses an axial magnetic field and a radial electric field. This is a
(a) Reflex klystron
(b) Crossed Field Amplifier (CFA)
(c) Travelling wave magnetron
(d) Co-axial magnetron

Ans. (d)

Q.118 Calculate the Nyquist rate for sampling when a continuous time signal is given by
$x(t) = 5\cos 100\pi t + 10\cos 200\pi t - 15\cos 300\pi t$
(a) 150 Hz (b) 600 Hz
(c) 300 Hz (d) 200 Hz

Ans. (c)

Q.119 When the fault current is 2000 A, for a relay setting of 50% with CT ratio $\frac{500}{5}$, the plug setting multiplier will be
(a) 16 (b) 8
(c) 4 (d) 12

Ans. (b)

Q.120 A 3-phase circuit breaker is rated at 2000 MVA, 33 kV, its making capacity will be
(a) 35 KA (b) 89 KA
(c) 70 KA (d) 49 KA

Ans. (b)

Q.121 Which of the following medium is used for the extinction of arc in air circuit breaker?
(a) Air (b) Water
(c) Oil (d) SF6

Ans. (a)

Q.122 In a two-phase linear servomotor, the rotor is designed to have
(a) low resistance and low inertia
(b) high resistance and high inertia
(c) low resistance and high inertia
(d) high resistance and low inertia

Ans. (d)

Q.123 The effect of adding external resistance in the rotor circuit of 3 ϕ slip ring induction motor is to

1. increase starting torque
2. decrease starting torque
3. reduce starting current
4. reduce maximum torque
5. improve power factor at starting

(a) 1, 3, 4, 5 (b) 2, 4, 5
(c) 2, 3, 4, 5 (d) 1, 3, 5

Ans. (d)

Q.124 A single phase ac voltage controller feeding a pure resistance load has a load voltage of 200 V (rms) when fed from a source of 250 V (rms). The input power factor of the controller is

(a) 0.64
(b) Difficult to estimate because of insufficiency of data
(c) 0.894
(d) 0.8

Ans. (d)

Q.125 In a single-phase fully controller bridge rectifier, the output load current I is ripple free. The r.m.s. value of source current would be

(a) $\frac{2\sqrt{2I}}{\pi}$ (b) $\frac{I}{4}$
(c) $\frac{I}{2}$ (d) I

Ans. (d)

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