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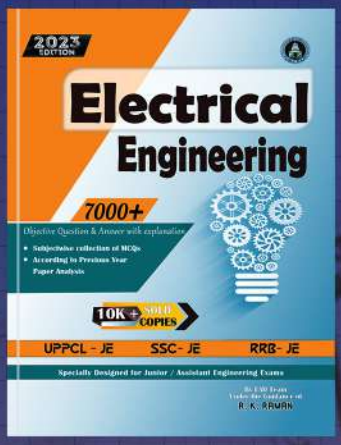

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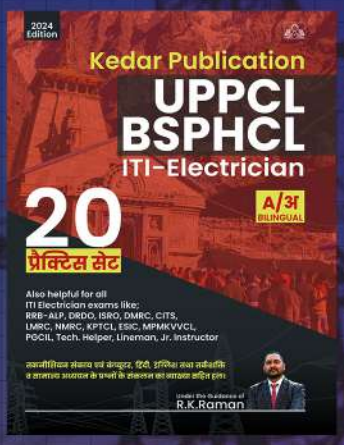

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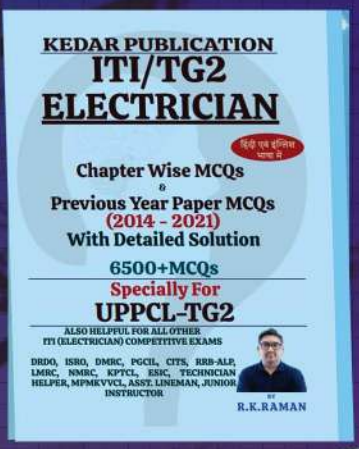

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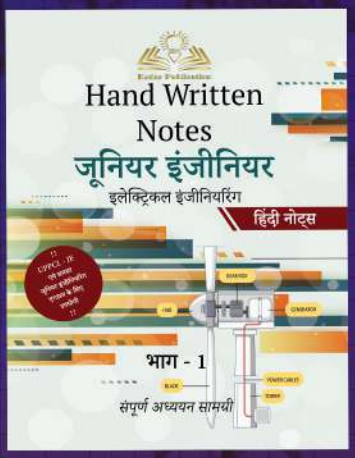

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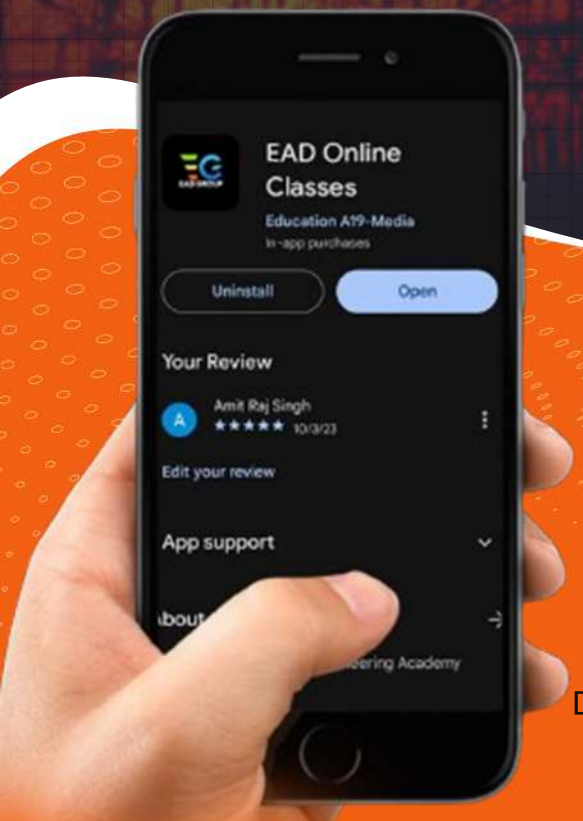

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Exam Date: **06-Jan-2021**
Exam Time: **12:30-14:30**
Post Name: **Vidhyut Sahayak - Junior Eng-Electrical**

GENERAL KNOWLEDGE - GENERAL KNOWLEDGE

Question No.1 Marks: 1.00
Bookmark

Who among the following authorities chaired the 22nd meeting of Financial Stability and Development Council held in May 2020?

(A) ○ Governor of RBI
(B) ○ **Union Finance Minister (Correct Answer)**
(C) ○ Union Home Affairs Minister
(D) ○ Prime Minister

Question No.2 Marks: 1.00
Bookmark

The Khelo India Youth Games 2020 was held in which city?

(A) ○ Pune
(B) ○ **Guwahati (Correct Answer)**
(C) ○ Jaipur
(D) ○ Nagpur

Question No.3 Marks: 1.00
Bookmark

Who was the first Indian to become Governor General of independent India?

(A) ○ Jawaharlal Nehru
(B) ○ Vallabhbhai Patel
(C) ○ **Rajagopalachari (Correct Answer)**
(D) ○ Rajendra Prasad

Question No.4 Marks: 1.00
Bookmark

Which one of the following is an example of sedimentary rocks?

(A) ○ **Sandstone (Correct Answer)**
(B) ○ Basalt
(C) ○ Granite
(D) ○ Marble

Question No.5 Marks: 1.00
Bookmark

The simultaneous presence of high rate of inflation and high rate of unemployment is called _____.

(A) ○ Disinflation
(B) ○ **Stagflation (Correct Answer)**
(C) ○ Deflation
(D) ○ Depression

Question No.6 Marks: 1.00
Bookmark

Under which field Abhijit Banerjee got Nobel Prize?

(A) ○ **Economics (Correct Answer)**
(B) ○ Medicine
(C) ○ Peace
(D) ○ Literature

Question No.7 Marks: 1.00
Bookmark

Where is the India's research station called Bharati located?

(A) ○ Europe
(B) ○ **Antarctica (Correct Answer)**
(C) ○ South America

(D) ○ Arctic

Question No.8 Marks: 1.00
Bookmark

In February 2020, the fourth East Asia Summit conference on maritime security cooperation was held in _____.

(A) ○ Berlin
(B) ○ Dubai
(C) ○ Oslo
(D) ○ **Chennai (Correct Answer)**

Question No.9 Marks: 1.00
Bookmark

What is the full form of 'SSC', a recruitment governing agency for Government of India?

(A) ○ Staff Standardised Commission
(B) ○ Staff Scrutiny Commission
(C) ○ **Staff Selection Commission (Correct Answer)**
(D) ○ Staff Screening Commission

Question No.10 Marks: 1.00
Bookmark

What is the full form of 'RAM', a type of computer memory?

(A) ○ Relative Access Memory
(B) ○ Ready Access Memory
(C) ○ **Random Access Memory (Correct Answer)**
(D) ○ Read Access Memory

ENGLISH KNOWLEDGE - ENGLISH KNOWLEDGE

Question No.1 Marks: 1.00
Bookmark

Rearrange the following to form a meaningful sentence and find the most logical order from the given options.

P: criterion for buying refurbished
Q: price and affordability is the key
R: smartphones amid the pandemic
S: a survey by Cashify suggests that

(A) ○ **SQPR (Correct Answer)**
(B) ○ PSRQ
(C) ○ SQRP
(D) ○ PQRS

Question No.2 Marks: 1.00
Bookmark

Fill in the blanks with suitable Preposition from the given alternatives.

There is a fruit shop just _____ the road.

(A) ○ about
(B) ○ **across (Correct Answer)**
(C) ○ besides
(D) ○ since

Question No.3 Marks: 1.00
Bookmark

Replace the underlined phrase grammatically and conceptually with the help of the given options. If the given sentence is correct then select the option 'The given sentence is correct'.

The Indian government wants its citizens **to delete the listed apps over** national security concerns.

(A) ○ to deleted the listed apps over
(B) ○ to delete a listed apps over
(C) ○ to deleted a listed apps over
(D) ○ **The given sentence is correct (Correct Answer)**

Question No.4 Marks: 1.00

Bookmark

Find the word which is correctly spelt from the given options.

(A) Fractare
(B) **Necessary (Correct Answer)**
(C) Weathar
(D) Spectakular

Question No.5 Marks: 1.00

Bookmark

Fill in the blanks with suitable Article from the given alternatives.

March and April are _____ most popular months for holidays.

(A) an
(B) a
(C) **the (Correct Answer)**
(D) No Article

Question No.6 Marks: 1.00

Bookmark

Choose the best option from the given alternatives which can be substituted for the given word/sentence.

One who collects coins.

(A) Mint
(B) **Numismatist (Correct Answer)**
(C) Misogynist
(D) Incredible

Question No.7 Marks: 1.00

Bookmark

Find the word which is correctly spelt from the given options.

(A) Credibel
(B) Subtantive
(C) Hypothatical
(D) **Stringent (Correct Answer)**

Question No.8 Marks: 1.00

Bookmark

Choose the word which expresses nearly the opposite meaning of the given word " INCUMBENT ".

(A) **Unnecessary (Correct Answer)**
(B) Necessary
(C) Binding
(D) Urgent

Question No.9 Marks: 1.00

Bookmark

Choose the word which best expresses the similar meaning of the given word " TRIVIAL ".

(A) Large
(B) Important
(C) Avoid
(D) **Small (Correct Answer)**

Question No.10 Marks: 1.00

Bookmark

In the following question, one part of the sentence may have an error. Find out which part of the sentence has an error and select the option corresponding to it. If the sentence does not have any error then select the option 'NO ERROR'.(Avoid punctuation errors)

(A) Every boy and girl / (B) were ready to attend / (C) the function. / (D) NO ERROR.

(A) A
(B) D
(C) **B (Correct Answer)**
(D) C

ELECTRICAL ENGINEERING - ELECTRICAL ENGINEERING

Question No.1 Marks: 1.00

Bookmark

The given impulse response h(n) of the LTI system is stable when _____.

$$h(n)=\begin{cases} a^n, & n<0 \\ b^n, & n\geq 0 \end{cases}$$

(A) ○ $|a|>1$ and $|b|>1$

(B) ○ $|a|<1$ and $|b|<1$

(C) ○ $|a|>1$ and $|b|<1$ **(Correct Answer)**

(D) ○ $|a|<1$ and $|b|>1$

Question No.2 Marks: 1.00

Bookmark

A 25-bus power system has 5 generator buses and 20 load buses. For the load flow analysis using Newton-Raphson method in polar coordinates, the size of the Jacobian matrix is _____.

(A) ○ 48 x 48

(B) ○ 25 x 25

(C) ○ 28 x 28

(D) ○ **44 x 44 (Correct Answer)**

Question No.3 Marks: 1.00

Bookmark

Consider the following two statements and identify the correct option.
Statement 1: The proportional (P) controller completely eliminates a steady state error.
Statement 2: The derivative controller reduces the rate of change of error.

(A) ○ Both Statement – 1 and Statement – 2 are FALSE

(B) ○ Statement – 1 is TRUE and Statement – 2 is FALSE

(C) ○ Both Statement – 1 and Statement – 2 are TRUE

(D) ○ **Statement – 1 is FALSE and Statement – 2 is TRUE (Correct Answer)**

Question No.4 Marks: 1.00

Bookmark

The bus admittance matrix of a simple four bus system is shown in Fig. is given as

Fig.

$$Y_{bus}=\begin{bmatrix} 1-j3 & 0 & -1+j3 & 0 \\ 0 & 1.666-j5 & -0.666+j2 & -1+j3 \\ -1+j3 & -0.666+j2 & 3.666-j11 & -2+j6 \\ 0 & -1+j3 & -2+j6 & 3-j9 \end{bmatrix}$$

The shunt admittance at all the buses is assumed to be negligible. If the line of admittance (2-j6) p.u. is connected between bus 1 and bus 2, the new bus admittance matrix is

(A) ○ $Y_{bus}=\begin{bmatrix} 3-j9 & -2+j6 & -1+j3 & 0 \\ -2+j6 & 3.666-j11 & -0.666+j2 & -1+j3 \\ -1+j3 & -0.666+j2 & 3.666-j11 & -2+j6 \\ 0 & -1+j3 & -2+j6 & 3-j9 \end{bmatrix}$ **(Correct Answer)**

(B) ○ $Y_{bus}=\begin{bmatrix} 3+j3 & 0 & -1+j3 & 0 \\ 0 & 3.666+j1 & -0.666+j2 & -1+j3 \\ -1+j3 & -0.666+j2 & 3.666-j11 & -2+j6 \\ 0 & -1+j3 & -2+j6 & 3-j9 \end{bmatrix}$

(C) ○ $Y_{bus}=\begin{bmatrix} 3-j9 & 0 & -1+j3 & 0 \\ 0 & 3.666-j11 & -0.666+j2 & -1+j3 \\ -1+j3 & -0.666+j2 & 3.666-j11 & -2+j6 \\ 0 & -1+j3 & -2+j6 & 3-j9 \end{bmatrix}$

(D) ○ $Y_{bus}=\begin{bmatrix} 3+j3 & 2-j6 & -1+j3 & 0 \\ 2-j6 & 3.666+j1 & -0.666+j2 & -1+j3 \\ -1+j3 & -0.666+j2 & 3.666-j11 & -2+j6 \\ 0 & -1+j3 & -2+j6 & 3-j9 \end{bmatrix}$

Question No.5 Marks: 1.00

Bookmark

The particular integral of the differential equation $(D^3 + D)y = e^x + e^{-x}$ is _____.

(A) ○ $\frac{1}{2}(e^x + e^{-x})$

(B) ○ $\frac{1}{2}(e^x - e^{-x})$ **(Correct Answer)**

(C) ○ $\frac{1}{2}(e^x + xe^{-x})$

(D) ○ $\frac{1}{2}(e^x - xe^{-x})$

Question No.6

Marks: 1.00

Bookmark

Consider the two point particles separated by a distance 'd' have charges Q_1 and Q_2 respectively. Particle Q_2 experiences an electrostatic force of 20 mN due to particle Q_1. If the charges of both particles are doubled and distance between them is also doubled, what is the magnitude of the electrostatic force between them?

(A) ○ 10 mN

(B) ○ 30 mN

(C) ○ 40 mN

(D) ○ **20 mN (Correct Answer)**

Question No.7

Marks: 1.00

Bookmark

The synchronous reactance of the synchronous machine 'X_s' is given as _____ where X_a and X_l are the armature reactance and leakage reactance of the synchronous machine.

(A) ○ $X_s = X_a + X_l$ **(Correct Answer)**

(B) ○ $X_s = \frac{X_a - X_l}{2}$

(C) ○ $X_s = \frac{X_a + X_l}{2}$

(D) ○ $X_s = X_a - X_l$

Question No.8

Marks: 1.00

Bookmark

If the severity of single line-to-ground fault at the terminals of an unloaded synchronous generator is lesser than that of 3-phase faults, then _____ where, X_1 is the positive sequence reactance of the generator, X_{g0} is the zero sequence reactance of the generator and X_n is the neutral reactance.

(A) ○ $X_n = 3(X_1 - X_{g0})$

(B) ○ $X_n < \frac{1}{3}(X_1 - X_{g0})$

(C) ○ $X_n = \frac{1}{3}(X_1 - X_{g0})$

(D) ○ $X_n > \frac{1}{3}(X_1 - X_{g0})$ **(Correct Answer)**

Question No.9

Marks: 1.00

Bookmark

A transformer has 3% resistance and 6% reactance drop. The voltage regulation at full-load, 0.8 power factor lagging is _____.

(A) ○ **6% (Correct Answer)**

(B) ○ -1.20%

(C) ○ -6%

(D) ○ 1.20%

Question No.10

Marks: 1.00

Bookmark

In the two-wattmeter method of power measurement for a three-phase load, the readings of the wattmeter are 2000 W and 1000 W. What is the power factor of the load?

(A) ○ 1
(B) ○ Zero
(C) ○ **0.866 (Correct Answer)**
(D) ○ 0.5

Question No.11 Marks: 1.00
Bookmark

A 25 MVA, 4-pole, 50 Hz turbo-alternator has an inertia constant H = 5 kW sec/kVA. The stored kinetic energy in the rotor at synchronous speed is _____.

(A) ○ 100 MJ
(B) ○ 62.5 MJ
(C) ○ **125 MJ (Correct Answer)**
(D) ○ 50 MJ

Question No.12 Marks: 1.00
Bookmark

What is the magnitude of the uniform magnetic field that contains as much energy per unit volume as a uniform 6000 V/m electric field?

(A) ○ $1 \times 10^{-5} T$

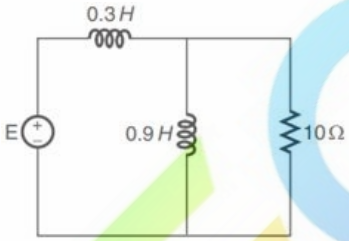
(B) ○ $4 \times 10^{-5} T$

(C) ○ $3 \times 10^{-5} T$

(D) ○ $2 \times 10^{-5} T$ **(Correct Answer)**

Question No.13 Marks: 1.00
Bookmark

What is the time constant of an RL circuit shown in Fig.?



(A) ○ **22.5 ms (Correct Answer)**
(B) ○ 30 ms
(C) ○ 60 ms
(D) ○ 120 ms

Question No.14 Marks: 1.00
Bookmark

The value of $\int_0^a \int_0^b \int_0^c xyz dx dy dz$ is equal to

(A) ○ $\frac{a^2c^2c^2}{2}$

(B) ○ $\frac{a^2c^2c^2}{2^2}$

(C) ○ $\frac{a^2c^2c^2}{8}$

(D) ○ $\frac{abc}{2}$

Question No.15

Marks: 1.00
Bookmark

The value of $\oint_C \frac{\sin^2 z}{(z-2)^2} dz$, where C is the circle $|z| = 1$ is equal to _____.

(A) ○ 1/2
(B) ○ 1
(C) ○ **0 (Correct Answer)**
(D) ○ Z/2

Question No.16

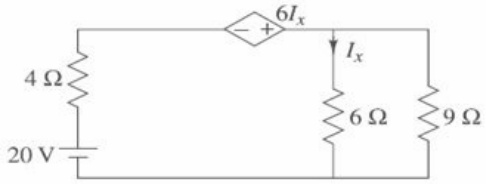
Marks: 1.00
Bookmark

Synchronous generator voltage obtained by the synchronous impedance method is _____.
(A) ○ nearly accurate as the generator is normally operated in the unsaturated region of magnetization
(B) ○ **higher than actual as it does not account for magnetic saturation (Correct Answer)**
(C) ○ lower than actual as it does not account for magnetic saturation
(D) ○ nearly accurate as it accounts for magnetic saturation

Question No.17

Marks: 1.00
Bookmark

The current flow through the 9Ω resistor for the electric circuit shown in Fig. is _____.



(A) ○ 1 A
(B) ○ 3 A
(C) ○ 4 A
(D) ○ **2 A (Correct Answer)**

Question No.18

Marks: 1.00
Bookmark

Consider two DC machines A and B having identical armature and four numbers of poles. If the machine A is wave wound and the machine B is lap wound, then _____.
(A) ○ Machine B will have more rated current and more voltage
(B) ○ Machine B will have less rated current and less voltage
(C) ○ Machine A will have more rated current and less voltage
(D) ○ **Machine A will have less rated current and more voltage (Correct Answer)**

Question No.19

Marks: 1.00
Bookmark

The electromagnetic torque developed in a motor is 200 Nm. If the field flux is decreased by 20% and armature current is increased by 20%, find the new electromagnetic torque developed.
(A) ○ 128 Nm
(B) ○ 240 Nm
(C) ○ 288 Nm
(D) ○ **192 Nm (Correct Answer)**

Question No.20

Marks: 1.00
Bookmark

The singular Solution of $z = px + qy + p^2 - q^2$ is _____

(A) ○ $2z = y^2 + x^2$
(B) ○ $4z = y^2 + x^2$
(C) ○ $4z = y^2 - x^2$ **(Correct Answer)**
(D) ○ $2z = y^2 - x^2$

Question No.21

Marks: 1.00

Bookmark

A three phase, 10 kW, 4-pole, 50 Hz induction motor has full load speed of 1440 rpm. The friction and windage loss of the motor at this speed is 500 W. Calculate the rotor copper loss.

(A) ○ 295 W

(B) ○ 395 W

(C) ○ 327.5 W

(D) ○ **437.5 W (Correct Answer)**

Question No.22

Marks: 1.00

Bookmark

The coefficient of a_0 in the Fourier series expansion of the function $f(x) = x$ in $-\pi < x < \pi$ is _____.

(A) ○ $\frac{\pi^2}{4}$

(B) ○ $\frac{\pi^2}{2}$

(C) ○ **0 (Correct Answer)**

(D) ○ π^2

Question No.23

Marks: 1.00

Bookmark

In an RS-flip flop, if R and S are set to logic-1 and logic-0 respectively, then the flip flop gives _____.

(A) ○ Set state

(B) ○ Indeterminate state

(C) ○ Hold state

(D) ○ **Reset state (Correct Answer)**

Question No.24

Marks: 1.00

Bookmark

If the flux density is $\vec{D} = (x+3)\hat{a}_x$, find the total charge inside a cubical volume of 1 m on a side situated in the positive octant with three edges coincident with the x, y and z axis and one corner at the origin.

(A) ○ 3 Coulombs

(B) ○ Zero

(C) ○ 4 Coulombs

(D) ○ **1 Coulomb (Correct Answer)**

Question No.25

Marks: 1.00

Bookmark

Consider a series RLC circuit excited by a sinusoidal source of 20 V resonates at a frequency of 50 Hz. If the bandwidth is 4 Hz, what will be the voltage across the capacitor?

(A) ○ 150 V

(B) ○ **250 V (Correct Answer)**

(C) ○ 100 V

(D) ○ 200 V

Question No.26

Marks: 1.00

Bookmark

The radius of curvature of the curve y=2x+3 at x=0 is equal to ___.

(A) ○ **∞ (Correct Answer)**

(B) ○ 1

(C) ○ x

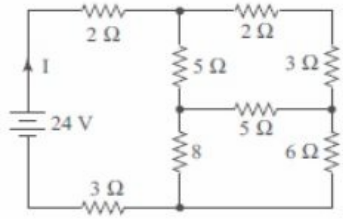
(D) ○ 0

Question No.27

Marks: 1.00

Bookmark

For the electrical circuit shown in Fig., the total current supplied by the 24 V battery is _____.



(A) ○ 1.1 A

(B) ○ 4.4 A

(C) ○ **2.2 A (Correct Answer)**

(D) ○ 3.3 A

Question No.28

Marks: 1.00

Bookmark

If $L(f(t)) = F(s)$, then $L(t^2 f(t)) =$

(A) ○ $-\frac{d^2F(s)}{ds^2}$

(B) ○ $2\frac{d^2F(s)}{ds^2}$

(C) ○ $\frac{1}{2}\frac{d^2F(s)}{ds^2}$

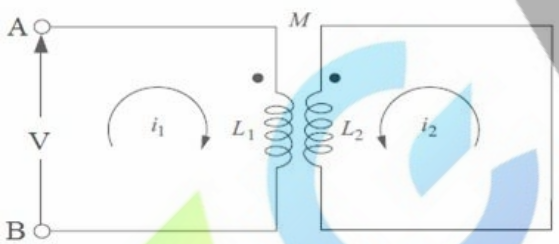
(D) ○ $\frac{d^2F(s)}{ds^2}$ **(Correct Answer)**

Question No.29

Marks: 1.00

Bookmark

For the circuit shown in Fig., the equivalent inductance seen at terminals A and B is _____.



(A) ○ $L_{eq} = L_2 - \frac{M^2}{L_1}$

(B) ○ $L_{eq} = L_1 + \frac{M^2}{L_2}$

(C) ○ $L_{eq} = L_1 - \frac{M^2}{L_2}$ **(Correct Answer)**

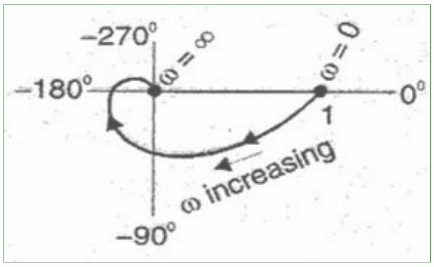
(D) ○ $L_{eq} = L_2 + \frac{M^2}{L_1}$

Question No.30

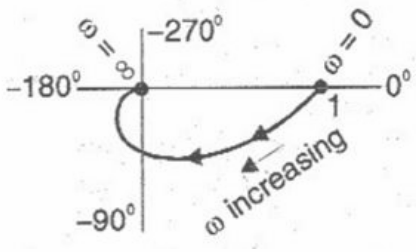
Marks: 1.00

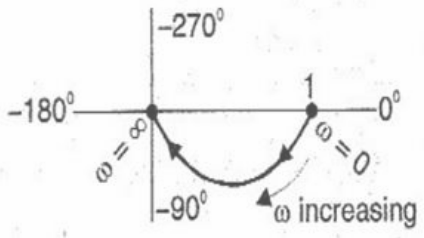
Bookmark

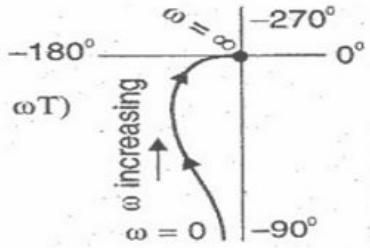
The polar plot for the open loop transfer function of a unity feedback system $G(s) = \frac{1}{(1+sT_1)(1+sT_2)(1+sT_3)}$ is given by_____.

(A) ○ 

(Correct Answer)

(B) ○ 

(C) ○ 

(D) ○ 

Question No.31

Marks: 1.00

Bookmark

Determine the total current in the circuit shown in Fig.

(A) ○ **5 A (Correct Answer)**

(B) ○ 10 A

(C) ○ 1 A

(D) ○ 8 A

Question No.32

Marks: 1.00

Bookmark

The symmetric impulse response having even number of samples cannot be used to design _____.

(A) ○ **Highpass filter (Correct Answer)**

(B) ○ Bandstop filter

(C) ○ Bandpass filter

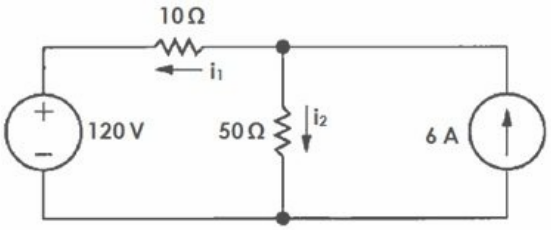
(D) ○ Lowpass filter

Question No.33

Marks: 1.00

Bookmark

The current 'i_1' and 'i_2' in the circuit shown in Fig. is _____.



(A) ○ 2 A and 4 A
(B) ○ **3 A and 3 A (Correct Answer)**
(C) ○ 1.5 A and 4.5 A
(D) ○ 1 A and 5 A

Question No.34 Marks: 1.00
Bookmark

Consider the following two statements and identify the correct option.
Statement 1: Piezoelectric transducer requires external power supply for their operation and is not self-generating.
Statement 2 : Thermistor do not require any external source of supply for their operation and is self-generating.

(A) ○ Statement - 1 is FALSE and Statement – 2 is TRUE
(B) ○ Both Statement -1 and Statement – 2 are TRUE
(C) ○ **Both Statement -1 and Statement – 2 are FALSE (Correct Answer)**
(D) ○ Statement - 1 is TRUE and Statement – 2 is FALSE

Question No.35 Marks: 1.00
Bookmark

A single phase current source inverter (CSI) has a capacitor 'C' as the load. For the constant source current , the voltage across the capacitor is _____.

(A) ○ square wave
(B) ○ pulsed wave
(C) ○ step function
(D) ○ **triangular wave (Correct Answer)**

Question No.36 Marks: 1.00
Bookmark

An AC voltage controller has a pure resistive load of 10 Ω and input voltage is 150 V(RMS), 50 Hz. The thyristor switch is ON for 25 cycles and OFF for 75 cycles. Determine the RMS output voltage and input power factor.

(A) ○ **75 V and 0.5 (Correct Answer)**
(B) ○ 150 V and 0.5
(C) ○ 150 V and 0.866
(D) ○ 75 V and 0.866

Question No.37 Marks: 1.00
Bookmark

In DC chopper, the load voltage is controlled by _____.

(A) ○ number of thyristors used in the circuit
(B) ○ DC voltage applied to the circuit
(C) ○ **duty cycle of the circuit (Correct Answer)**
(D) ○ None of the above

Question No.38 Marks: 1.00
Bookmark

Determine the value of K for stability of unity feedback system whose open loop transfer function is given by _____.

$$G(s) = \frac{K}{s(s+1)(s+5)}$$

(A) ○ $0 < K < 45$
(B) ○ $K > 30$
(C) ○ $0 < K < 30$ **(Correct Answer)**
(D) ○ $K > 45$

Question No.39 Marks: 1.00

Bookmark

If $F(f(x)) = \frac{1}{\sqrt{2\pi}}\int_{-\infty}^{\infty} f(x)e^{isx}\,dx = F(s)$, then $F[f(x-a)] =$

(A) $e^{-ias}F(s)$

(B) $e^{ias}F(s)$ **(Correct Answer)**

(C) $F(s+a)$

(D) $F(s-a)$

Question No.40 Marks: 1.00

Bookmark

Find the incident average power of an electric field wave travelling in air and incident normally on a boundary between air and a dielectric having permeability μ0 and permittivity $\varepsilon_r = 4$.

(A) $P_i = \dfrac{E_i^2}{2\sqrt{\dfrac{\varepsilon_0}{\mu_0}}}$

(B) $P_i = \dfrac{E_i^2}{\sqrt{\dfrac{\mu_0}{\varepsilon_0}}}$

(C) $P_i = \dfrac{E_i^2}{2\sqrt{\dfrac{\mu_0}{\varepsilon_0}}}$ **(Correct Answer)**

(D) $P_i = \dfrac{E_i^2}{\sqrt{\mu_0\varepsilon_0}}$

Question No.41 Marks: 1.00

Bookmark

Consider the system defined by

$\dot{x} = Ax + Bu$

$y = Cx$

where, $A = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 0 & 1 \\ -6 & -11 & -6 \end{bmatrix}$

$B = \begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$ and $C = [10 \quad 5 \quad 1]$

Check the system for complete state controllability and complete observability and choose the correct option.

(A) The system is completely observable but not completely state controllable

(B) The system is not completely state controllable and not completely observable

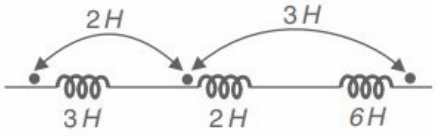
(C) **The system is completely state controllable and completely observable (Correct Answer)**

(D) The system is completely state controllable but not completely observable

Question No.42 Marks: 1.00

Bookmark

Determine the effective inductance of the series-connected coupled coils shown in Fig.



(A) ○ 12 H
(B) ○ 16 H
(C) ○ **9 H (Correct Answer)**
(D) ○ 3 H

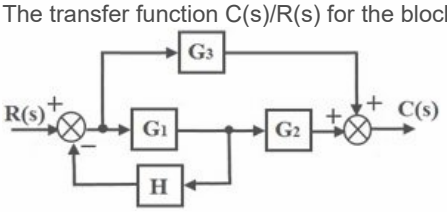
Question No.43 Marks: 1.00
Bookmark

Consider the following two statements and identify the correct option.
Statement 1: Both MOSFET and BJT have positive temperature coefficient.
Statement 2: MOSFET can be used as a voltage controlled capacitor.

(A) ○ **Statement – 1 is FALSE and Statement – 2 is TRUE (Correct Answer)**
(B) ○ Statement – 1 is TRUE and Statement – 2 is FALSE
(C) ○ Both Statement – 1 and Statement – 2 are FALSE
(D) ○ Both Statement – 1 and Statement – 2 are TRUE

Question No.44 Marks: 1.00
Bookmark

The transfer function C(s)/R(s) for the block diagram shown in Fig. is:



(A) ○ $\frac{C(s)}{R(s)} = \frac{G_1G_2 + G_3}{1 + G_1H}$ **(Correct Answer)**
(B) ○ $\frac{C(s)}{R(s)} = \frac{G_1 + G_2G_3}{1 + G_1H}$
(C) ○ $\frac{C(s)}{R(s)} = \frac{1 + G_1G_2G_3}{1 + G_1G_2G_3H}$
(D) ○ $\frac{C(s)}{R(s)} = \frac{G_1G_2G_3}{1 + G_1G_2H}$

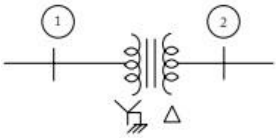
Question No.45 Marks: 1.00
Bookmark

The rotor of a four-pole, 50 Hz slip-ring induction motor has a resistance of 0.2 Ω per phase and runs at 1425 rpm at full-load. Determine the external resistance per phase which must be added to reduce the speed to 1200 rpm, the torque remaining same in both the cases.

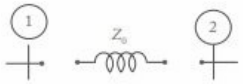
(A) ○ 0.8 Ω
(B) ○ 0.2 Ω
(C) ○ 0.4 Ω
(D) ○ **0.6 Ω (Correct Answer)**

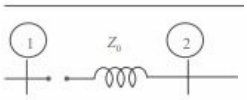
Question No.46 Marks: 1.00
Bookmark

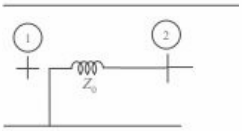
The zero-sequence network equivalent for the transformer connected between buses 1 and 2 as shown in Fig. is:

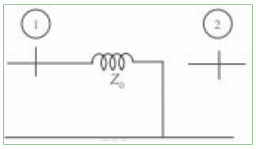


(A) ○



(B) ○ 

(C) ○ 

(D) ○  **(Correct Answer)**

Question No.47 Marks: 1.00

Bookmark

A three phase, 4-pole, 50 Hz induction motor has full load speed of 1455rpm. What will be the frequency of the rotor-induced EMF?

(A) ○ **1.5 Hz (Correct Answer)**

(B) ○ 2 Hz

(C) ○ 1 Hz

(D) ○ 3 Hz

Question No.48 Marks: 1.00

Bookmark

Determine the Nyquist sampling frequency and Nyquist interval for the signal,

$$x(t)=\left[\frac{\sin 200\pi t}{\pi t}\right]^2$$

(A) ○ 200 Hz, 2.5 ms

(B) ○ 200 Hz, 5ms

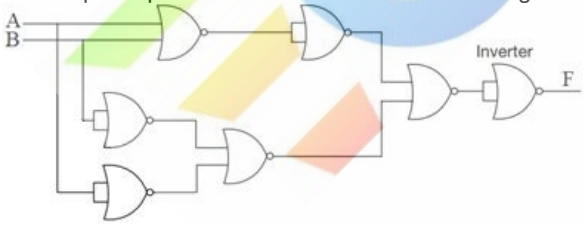
(C) ○ 400 Hz, 5 ms

(D) ○ **400 Hz, 2.5 ms (Correct Answer)**

Question No.49 Marks: 1.00

Bookmark

The output expression 'F' for the combinational logic circuit shown in Fig. is given by:



(A) ○ $F = AB$

(B) ○ $F = \overline{A}\,\overline{B} + AB$

(C) ○ $F = A + B$ **(Correct Answer)**

(D) ○ $F = \overline{A}B + A\overline{B}$

Question No.50 Marks: 1.00

Bookmark

If the sum of two eigen values of a 3X3 matrix is equal to the trace of the matrix, then the product of the eigen values is equal to _____.

(A) ○ **0 (Correct Answer)**

(B) ○ 1

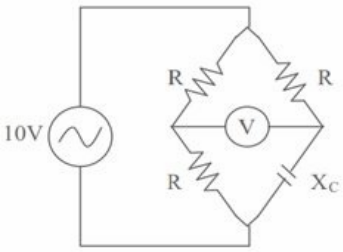
(C) ○ 9

(D) ○ 3

Question No.51 Marks: 1.00

Bookmark

In the bridge circuit shown in Fig. when $X_C/R = 1$, the voltmeter reads:



(A) ○ 10 V

(B) ○ **0 V (Correct Answer)**

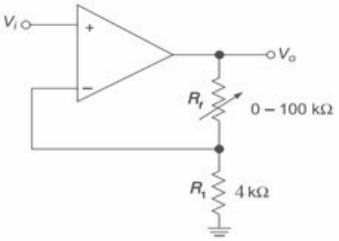
(C) ○ 2.5 V

(D) ○ 5 V

Question No.52 Marks: 1.00

Bookmark

Determine the minimum and maximum closed loop voltage gain for the non-inverting amplifier circuit shown in Fig. Assume an ideal op-amp and the variable resistance varies from 0 to 100 kΩ.



(A) ○ 1 and 24

(B) ○ **1 and 26 (Correct Answer)**

(C) ○ 0 and 26

(D) ○ 0 and 24

Question No.53 Marks: 1.00

Bookmark

A 4-pole wave connected armature of a DC machine has 600 conductors and is driven at 650 rev/min. If the flux per pole is 25mWb, determine the generated emf.

(A) ○ 500 V

(B) ○ 650 V

(C) ○ 162.5 V

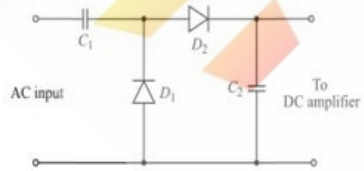
(D) ○ **325 V (Correct Answer)**

Question No.54 Marks: 1.00

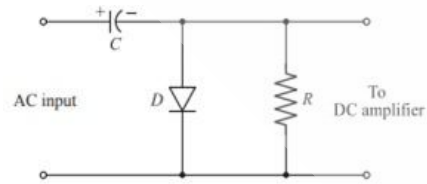
Bookmark

Which of the following circuit diagrams represents an average reading AC voltmeter?

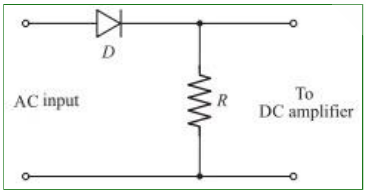
(A) ○



(B) ○



(C) ○



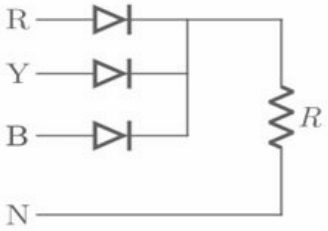
(Correct Answer)

(D) ○ None of the above

Question No.55 Marks: 1.00

Bookmark

Consider a 3-phase half-wave rectifier circuit shown in the figure. The source is a symmetrical, 3-phase four wire system. The line-to-line voltage of the source is 150 V and the supply frequency is 300 Hz. The ripple frequency at the output is _____.



(A) 1200 Hz

(B) **900 Hz (Correct Answer)**

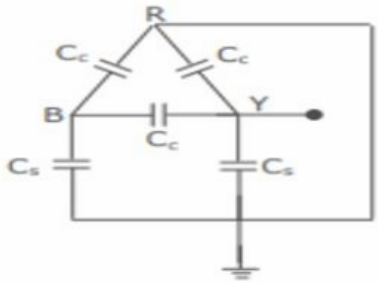
(C) 300 Hz

(D) 150 Hz

Question No.56 Marks: 1.00

Bookmark

The capacitance measured between terminals B and Y for the circuit shown in Fig. is _____.



(A) $\frac{C_c + 2C_s}{3}$

(B) $\frac{C_s + 3C_c}{2}$ **(Correct Answer)**

(C) $\frac{C_s + 2C_c}{3}$

(D) $\frac{C_c + 3C_s}{2}$

Question No.57 Marks: 1.00

Bookmark

If $u = f(x-y, y-z, z-x)$, then $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} =$

(A) 2 1/9

(B) u

(C) **0 (Correct Answer)**

(D) 2u

Question No.58 Marks: 1.00

Bookmark

Which of the following gates is represented by the Boolean expression: F = A + B + C + D

(A) 4-input NAND gate

(B) **4-input OR gate (Correct Answer)**

(C) 4-input NOR gate

(D) 4-input AND gate

Question No.59 Marks: 1.00

Bookmark

The full-load copper loss of a transformer is twice its core loss. The efficiency will be maximum at _____.

(A) 141% of full load
(B) 25% of full load
(C) 50% of full load
(D) **70.7% of full load (Correct Answer)**

Question No.60 Marks: 1.00

Bookmark

Consider a 3-phase, 3-wire system with star connected load of impedance (4+j3) Ω per phase. If the line voltage is 240 V, the power absorbed by each phase is _____.

(A) 1775 W
(B) **3072 W (Correct Answer)**
(C) 5320 W
(D) 2944 W

COMPUTER KNOWLEDGE - COMPUTER KNOWLEDGE

Question No.1 Marks: 1.00

Bookmark

Which of the following is the simplest of the complex topologies and is developed by serially interconnecting all the hubs of a network?

(A) **Daisy Chains (Correct Answer)**
(B) Hierarchical Combinations
(C) Hierarchical Rings
(D) Hierarchical Stars

Question No.2 Marks: 1.00

Bookmark

Which of the following is false about Trojan horse?

(A) Trojan horse refers to tricking someone into inviting an attacker into a securely protected area.
(B) **Trojan horse is a software that is designed to be spread from one computer to another, often sent as email attachment. (Correct Answer)**
(C) Trojan horse can inject themselves into other files or otherwise propagate themselves.
(D) Trojan horse is a malicious bit of attacking code or software that tricks users into running it willingly, by hiding behind a legitimate program.

Question No.3 Marks: 1.00

Bookmark

_____ replaced vacuum tubes in computer designs, giving rise to the second generation of computers.

(A) Large scale Integration chips
(B) Microprocessors
(C) **Transistors (Correct Answer)**
(D) Integrated Chips

Question No.4 Marks: 1.00

Bookmark

Which of the following is the only memory management method that does not provide the user's program with a linear and contiguous address space?

(A) Paged Memory Management
(B) Partitioned Allocation
(C) Single Contiguous Allocation
(D) **Segmented Memory Management (Correct Answer)**

Question No.5 Marks: 1.00

Bookmark

Which of the following is not true about process and thread?

(A) A process will need certain resources such as CPU time, memory, etc.
(B) **A thread may contain multiple processes. (Correct Answer)**
(C) A process can be thought of as a program in execution.
(D) If multiple threads attempt to access the synchronization objects, deadlock is possible.

Question No.6 Marks: 1.00

Bookmark

In Ethernet networks, each network interface controller has a unique MAC address. MAC stands for _____.

(A) Machine Address Controller
(B) Machine Access Control
(C) **Media Access Control (Correct Answer)**
(D) Media Address Controller

Question No.7 Marks: 1.00
Bookmark

What is the use of Ctrl+W in Microsoft Word?

(A) **To close the document (Correct Answer)**
(B) To open View ribbon
(C) To insert Word Art
(D) To show print preview

Question No.8 Marks: 1.00
Bookmark

Identify the type of locality of reference based on the below inputs:

If there are only a few possible alternatives for the prospective part of the path, when an instruction loop has a simple structure or restricted to a small set of possibilities and the possibilities can be located far away from each other.

(A) **Branch locality (Correct Answer)**
(B) Temporal locality
(C) Equidistant locality
(D) Spatial locality

Question No.9 Marks: 1.00
Bookmark

Which of the following defines the Man-in-the-middle attack?

(A) **is an attack where the attacker secretly relays and possibly alters the communications between two parties who believe that they are directly communicating with each other. (Correct Answer)**
(B) is a cyber-attack in which the perpetrator seeks to make a machine or network resource unavailable to its intended users by temporarily or indefinitely disrupting services of a host connected to the Internet.
(C) is a form of computer security hacking in which corrupt Domain Name System data is introduced into the DNS resolver's cache, causing the name server to return an incorrect result record.
(D) a technique by which an attacker sends Address Resolution Protocol messages onto a local area network.

Question No.10 Marks: 1.00
Bookmark

Which of the following MS Excel functions will produce random number integers >=1 and <=5 (ignore single quote in front)?

(A) '=int(rand()*6)
(B) **'=randbetween(1,5) (Correct Answer)**
(C) '=randbetween(0,6)
(D) '=rand()*5

GUJARATI LANGUAGE AND GRAMMAR - GUJARATI LANGUAGE AND GRAMMAR

Question No.1 Marks: 1.00
Bookmark

..... ચાર બેસે ચોટલા તો વાળી ઊઠે ઓટલા.
આ અધૂરી કહેવતને પૂર્ણ કરવા માટે આપેલા વિકલ્પોમાંથી ચયન કરો.

(A) ગામ ત્યાં ઢેડવાડો
(B) ગામને મોઢે ન બંધાય
(C) **ચાર બેસે પાઘડી તો વાત કરે પાધરી (Correct Answer)**
(D) ગોળાને મોઢે ગળણું બંધાય

Question No.2 Marks: 1.00
Bookmark

કાન : શ્રવણ :: મુખ : ?????

(A) ○ **બોલવું (Correct Answer)**
(B) ○ સુંઘવું
(C) ○ જોવું
(D) ○ ચાલવું

Question No.3 Marks: 1.00
Bookmark

નીચેનામાંથી કઈ જોડણી ખોટી છે?
(A) ○ **વિપરિત (Correct Answer)**
(B) ○ ખંડિત
(C) ○ પરિચિત
(D) ○ ગણિત

Question No.4 Marks: 1.00
Bookmark

સમાસના બે પદો વચ્ચે પૂરકનો સંબંધ હોય તે વિકલ્પ કયો છે?
(A) ○ **ભાઈબહેન (Correct Answer)**
(B) ○ લંબચોરસ
(C) ○ જેમતેમ
(D) ○ સ્વર્ગવાસ

Question No.5 Marks: 1.00
Bookmark

'કીર્તિવાન'નો વિરુદ્ધાર્થી શબ્દ કયો?
(A) ○ કીર્તિમાન
(B) ○ કીર્તિ જેવો વાન ન હોવો
(C) ○ અપકીર્તિ
(D) ○ **કીર્તિહીન (Correct Answer)**

Question No.6 Marks: 1.00
Bookmark

'સૌ+ઇત્રીની મન+ઈષા હતી કે સર:+વરને કાંઠે એને વટો+ઋક્ષની છાયામાં જગત્ + ગુરૂનાં આશીર્વાદ મળે.
સંધિ જોડીને વાક્યને શુદ્ધ સ્વરૂપ આપો.
(A) ○ સૌવીત્રીની મનિષા હતી કે સરોવરને કાંઠે એને વાતૃક્ષની છાયામાં જગતગુરુનાં આશીર્વાદ મળે.
(B) ○ સાવિત્રીની મનોઇશા હતી કે સરવરને કાંઠે એને વટવૃક્ષની છાયામાં જગતગુરુનાં આશીર્વાદ મળે.
(C) ○ સૌવિત્રીની માંનીષા હતી કે સરવરને કાંઠે એને વટવ્રીક્સની છાયામાં જગતગુરુનાં આશીર્વાદ મળે.
(D) ○ **સાવિત્રીની મનીષા હતી કે સરોવરને કાંઠે એને વટવૃક્ષની છાયામાં જગદ્ગુરૂનાં આશીર્વાદ મળે. (Correct Answer)**

Question No.7 Marks: 1.00
Bookmark

'અછત'નો સમાનાર્થી શબ્દ કયો?
(A) ○ છત વિનાનું ઘર
(B) ○ **તંગી (Correct Answer)**
(C) ○ છત્રી ફાટી જવી
(D) ○ ચુસ્ત

Question No.8 Marks: 1.00
Bookmark

એ યોગ્ય વાક્યનું ચયન કરો જેમાં પરોક્ષ ભૂતકૃદંત વિશેષણ તરીકે વપરાયું હોય.
(A) ○ ઉક્ત ત્રણેય વિકલ્પોમાં પરોક્ષ ભૂતકૃદંતનો ઉપયોગ કરાયો નથી'
(B) ○ 'રમેશ અને હું નાનપણથી સાથે રહેલા'
(C) ○ 'મારે તમને એક વાત કહેવી છે'
(D) ○ **'બોલ્યાં વેણ તીર સમા' (Correct Answer)**

Question No.9 Marks: 1.00
Bookmark

કયા છંદમાં 17 અક્ષર, બંધારણ : 'મ ભ ન ત ત ગા ગા' અને યતિ -૪ તથા ૧૦માં અક્ષરે હોય?

(A) ○ હરિગીત
(B) ○ શિખરિણી
(C) ○ પૃથ્વીછંદ
(D) ○ **મંદાક્રાન્તા (Correct Answer)**

Question No.10 Marks: 1.00

Bookmark

ઇન્દ્રાવતી નદી: ગોદાવરી:: નંદાકિની નદી: ??????
(A) ○ સિંધુ
(B) ○ કાવેરી
(C) ○ નર્મદા
(D) ○ **ગંગા (Correct Answer)**

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