UPPCL AE

Previous Year Paper

EC 5 November 2019

UTTAR PRADESH POWER CORPORATION LTD.

Participant ID	
Participant Name	
Test Center Name	
Test Date	05/11/2019
Test Time	9:00 AM - 12:00 PM
Subject	Assistant Engineer Trainee Electronics and Telecommunication

Section : **Technical_Electronics and Telecommunication Engineering**

Q.1 Find the characteristic equation of the system with the following plant matrix, $A = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$

Ans

✗ A. $\lambda^3 + \lambda^2 + 3\lambda + 6 = 0$

✗ B. $\lambda^2 + 3\lambda + 4 = 0$

✗ C. $\lambda^3 + \lambda^2 + 3\lambda + 4 = 0$

✓ D. $\lambda^2 + 3\lambda + 2 = 0$

Question ID : **8970321697**
Status : **Answered**
Chosen Option : **4**

Q.2 Find the final value of the signal $y(t)$ whose unilateral Laplace transform is:

$$Y(s) = \frac{7s+9}{s(s+5)}$$

Ans

✗ A. $\frac{7}{9}$

✗ B. $\frac{7}{3}$

✓ C. $\frac{9}{5}$

✗ D. $\frac{9}{7}$

Question ID : **8970321628**
Status : **Answered**
Chosen Option : **3**

Q.3 The effect of the phase lead compensator on the phase margin of the open loop transfer function is:

Ans

✗ A. No change.

✗ B. increase in over shoot of step response

✔ C. improvement in phase margin

✘ D. reduction in phase margin

Question ID : **8970321695**
Status : **Answered**
Chosen Option : **3**

Q.4 A random experiment has 64 equally likely outcomes. Find the information associated with each outcome.

Ans

✘ A. 3 bits

✘ B. 2 bits

✔ C. 6 bits

✘ D. 5 bits

Question ID : **8970321717**
Status : **Answered**
Chosen Option : **3**

Q.5 If the autocorrelation function of the sinusoidal signal $x(t)=A\cos(\omega_0 t+\phi)$ is $R(\tau)$, then $R(0)$ is given by (in terms of power spectral density of $R(\tau)=S(f)$).

Ans

✔ A. $R(0)=\int_{-\infty}^{\infty} S(f)\,df$

✘ B. $R(0)=\int_{-\infty}^{\infty} \exp\{S(f)\}\,df$

✘ C. $R(0)=S(f)|f=\infty$

✘ D. $R(0)=\int_{-\infty}^{\infty} \ln\ S(f)\,df$

Question ID : **8970321708**
Status : **Answered**
Chosen Option : **1**

Q.6 The autocorrelation function of the sinusoidal signal $x(t)=A\cos(\omega_0 t+\phi)$ is:

Ans

✘ A. $R(\tau)=A^2\times\cos(\omega_0\tau)$

✔ B. $R(\tau)=\frac{A^2}{2\times\cos(\omega 0\,\tau)}$

✘ C. $R(\tau)=\frac{A^2}{4\times\cos(2\omega 0\,\tau)}$

✘ D. $R(\tau)=\frac{A^2}{2\times\cosh(\omega 0\,\tau)}$

Question ID : **8970321711**
Status : **Marked For Review**
Chosen Option : **1**

Q.7 If the covariance of two random variable X and Y is μ_{XY}, their correlation coefficient ρ_{XY} is:

Ans

✘ A. $\ln \mu_{XY}$

✘ B. $\ln\left(\frac{\mu_{XY}}{\sigma_X\sigma_Y}\right)$

✗ C. $\frac{\sigma_X \sigma_Y}{\mu_{XY}}$

✓ D. $\frac{\mu_{XY}}{\sigma_X \sigma_Y}$

Question ID : **8970321705**
Status : **Answered**
Chosen Option : **4**

Q.8 The number of roots of the system to the right half of s-plane of the system noted by the characteristic equation, $F(s) = s^4 + 2s^3 + 6s^2 + 8s + 12 = 0$ is:

Ans

✗ A. 4

✗ B. 6

✗ C. 3

✓ D. 2

Question ID : **8970321701**
Status : **Answered**
Chosen Option : **4**

Q.9 If the autocorrelation function of a random process X(t) is R(τ) its power spectral density is:

Ans

✗ A. S(f)=ln R(τ)

✗ B. S(f)=exp (R(τ))

✗ C. S(f)=R(τ)*R(τ)

✓ D. $S(f)= \int_{-\infty}^{\infty} R(\tau)\exp\{-(j \times 2\pi \times f \times \tau)\}\, d\tau$

Question ID : **8970321707**
Status : **Answered**
Chosen Option : **4**

Q.10 In a series circuit, three resistances of 2 Ω, 4 Ω, and 6 Ω are connected to a 12 V DC supply. The voltage across the 4Ω resistance is:

Ans

✓ A. 4 V

✗ B. 6 V

✗ C. 2 V

✗ D. 8 V

Question ID : **8970321613**
Status : **Answered**
Chosen Option : **1**

Q.11 The transfer function of the state variable representation of the system given by the differential equation, y'''+6y''+11y'+6y=6u is:

Ans

✗ A. $\frac{6}{(s^3+6s^2+11s+16)}$

✓ B. $\frac{6}{(s^3+6s^2+11s+6)}$

✗ C. $\frac{8}{(s^3+6s^2+11s+12)}$

✗ D. $\frac{5}{(s^3+6s^2+11s+5)}$

Question ID : **8970321698**
Status : **Answered**
Chosen Option : **2**

Q.12 Using a μA 741 OPAMP, a first order lowpass filter is designed to have a cutoff frequency of 1kHz. If the value of the capacitance used is 1nF, find the value of R.

Ans

✓ A. 159.15 kΩ

✗ B. 160.87 kΩ

✗ C. 172.42 kΩ

✗ D. 127.78 kΩ

Question ID : **8970321666**
Status : **Answered**
Chosen Option : **1**

Q.13 The velocity of propagation of EM wave in free space is:

Ans

✗ A. $\sqrt{\frac{\varepsilon_0}{\mu_0}}$

✗ B. $\mu_0\varepsilon_0$

✗ C. $\sqrt{(\mu_0\varepsilon_0)}$

✓ D. $\frac{1}{\sqrt{(\mu_0\varepsilon_0)}}$

Question ID : **8970321734**
Status : **Answered**
Chosen Option : **4**

Q.14 If E=4V/m, of a wave in free space, H will be:

Ans

✗ A. 30π A/m

✗ B. 60π A/m

✗ C. $\frac{1}{(60\pi)\text{A/m}}$

✓ D. $\frac{1}{(30\pi)\text{A/m}}$

Question ID : **8970321733**
Status : **Answered**
Chosen Option : **4**

Q.15 A single stage non-inverting amplifier has $R_F = 220\text{k}\Omega$ and $R_1 = 10\text{k}$. If two such stages are cascaded, find the mid frequency gain of the cascade.

Ans

✗ A. 27.23 dB

✓ B. 54.47 dB

✗ C. -54.47 dB

✗ D. -27.23 dB

Question ID : **8970321662**
Status : **Answered**
Chosen Option : **2**

Q.16 For a system with characteristic equation $F(s) = s^4 + 2s^3 + 6s^2 + 4s + K = 0$ to be stable, the value of K must be:

Ans

✗ A. K=∞

✓ B. K<8

✗ C. K>8

✗ D. K=9

Question ID : **8970321702**
Status : **Answered**
Chosen Option : **2**

Q.17 If the Fourier transform of $x(t)$ is $X(j\omega)$, obtain the Fourier transform of $x(t - t_0)$.

Ans

✗ A. $e^{-i\omega t}{}_0 X(j\, t_0)$

✗ B. $e^{i\omega t}{}_0 X(j\omega)$

✗ C. $e^{-i\omega t}{}_0 X(j\omega t_0)$

✓ D. $e^{-i\omega t}{}_0 X(j\omega)$

Question ID : **8970321626**
Status : **Answered**
Chosen Option : **4**

Q.18 For a Common Source (CS) MOSFET amplifier, what is the input capacitance C_{in} for the following conditions:
$C_{gs} = 4pF, C_{gd} = 1pF$, and $A_v = 5$.

Ans

✓ A. 10 pF

✗ B. 16 pF

✗ C. 14 pF

✗ D. 12 pF

Question ID : **8970321649**
Status : **Answered**
Chosen Option : **1**

Q.19 The attenuation constant of a medium is 400/cm. Find the skin depth in the medium.

Ans

✗ A. 2.00 mm

✗ B. 1.55 mm

✗ C. 3.50 mm

✓ D. 2.50 mm

Question ID : **8970321740**
Status : **Answered**
Chosen Option : **4**

Q.20 If, $f(s) = \left[\frac{(s-a)(s-b)}{(s-c)(s-d)}\right]$ the poles of f(s) are:

Ans
- ✗ A. $s = a \text{ and } s = 0$
- ✓ B. $s = c \text{ and } s = d$
- ✗ C. $s = a \text{ and } s = b$
- ✗ D. $s = 0 \text{ and } s = \infty$

Question ID : **8970321621**
Status : **Answered**
Chosen Option : **2**

Q.21 For a White Additive Gaussian Channel, the channel bandwidth is 100MHz, and the S/N power ratio is 40dB, find the Channel capacity in bits/sec.

Ans
- ✓ A. 1328.786×10^6 bits/sec
- ✗ B. 1248.687×10^6 bits/sec
- ✗ C. 1245.687×10^6 bits/sec
- ✗ D. 2245.687×10^6 bits/sec

Question ID : **8970321725**
Status : **Answered**
Chosen Option : **1**

Q.22 The 9's complement of the decimal number 4567.86 is:

Ans
- ✗ A. 5678.23
- ✗ B. 5643.13
- ✗ C. 5643.12
- ✓ D. 5432.13

Question ID : **8970321668**
Status : **Answered**
Chosen Option : **4**

Q.23 If σ=4.0℧/m and E=5.0V/m, the conduction current density is:

Ans
- ✗ A. $10.0 A/m^2$
- ✗ B. $5.0 A/m^2$
- ✗ C. $1.25 A/m^2$
- ✓ D. $20.0 A/m^2$

Question ID : **8970321732**
Status : **Answered**
Chosen Option : **4**

Q.24 If A'+AB = 0, find the values of A and B.

Ans
- ✗ A. A= 1 and B =1
- ✓ B. A= 1 and B =0

✗ C. A= 0 and B =1

✗ D. A= 0 and B =0

Question ID : **8970321671**
Status : **Answered**
Chosen Option : **2**

Q.25 A 2n variable Karnaugh Map has _____ cells.

Ans

✗ A. $4n^2$

✗ B. 4^{2n}

✓ C. 2^{2n}

✗ D. n^{2n}

Question ID : **8970321675**
Status : **Answered**
Chosen Option : **3**

Q.26 How many bits can be compared in parallel using one 74LS85 chip?

Ans

✗ A. 3

✗ B. 2

✓ C. 4

✗ D. 8

Question ID : **8970321679**
Status : **Not Answered**
Chosen Option : **--**

Q.27 The internal resistance of a DC voltage source is 5Ω and a load resistance of R_L is connected to it. Maximum power will be transferred to the load resistance when R_L is equal to:

Ans

✓ A. $5\ \Omega$

✗ B. $2.5\ \Omega$

✗ C. $0\ \Omega$

✗ D. ∞

Question ID : **8970321615**
Status : **Marked For Review**
Chosen Option : **1**

Q.28 A fair dice is rolled one. Find the entropy of the outcomes.

Ans

✗ A. 4.564 bits

✓ B. 2.585 bits

✗ C. 3.256 bits

✗ D. 2.654 bits

Question ID : **8970321718**
Status : **Answered**
Chosen Option : **2**

Q.29 How many cells will be there in the K-Map to solve in a 4 variable Boolean expression using K-Map?

Ans
✗ A. 64
✓ B. 16
✗ C. 24
✗ D. 32

Question ID : **8970321672**
Status : **Answered**
Chosen Option : **2**

Q.30 Find the initial value of the signal $x(t)$ whose unilateral Laplace transform is:

$$X(s) = \frac{5s+10}{s(s+4)}$$

Ans
✓ A. 5
✗ B. 10
✗ C. 14
✗ D. 4

Question ID : **8970321627**
Status : **Answered**
Chosen Option : **1**

Q.31 Find the reverse saturation current at 35 °C for a junction which has $I_0 = 30$ nA at 25 °C.

Ans
✗ A. 25 nA
✗ B. 40 nA
✓ C. 60 nA
✗ D. 20 nA

Question ID : **8970321645**
Status : **Answered**
Chosen Option : **3**

Q.32 A Si wafer is doped with 10^{16} P atoms/c m^3 . Calculate the equilibrium hole concentration p_0 at 300K. Assume $n_i = 1.5 \times 10^{10} cm^{-3}$ and $N_d >> n_i$.

Ans
✗ A. $2.5 \times 10^5 cm^{-3}$
✓ B. $2.55 \times 10^4 cm^{-3}$
✗ C. $2.55 \times 10^5 cm^{-3}$
✗ D. $2.05 \times 10^4 cm^{-3}$

Question ID : **8970321638**
Status : **Answered**
Chosen Option : **2**

Q.33 A 4-bit XS-3 parallel adder needs _____ 4-bit parallel adder IC 74LS83s.

Ans
✗ A. 3

✔ B. 2

✗ C. 4

✗ D. 1

Question ID : **8970321678**
Status : **Answered**
Chosen Option : **3**

Q.34 A 12-bit parallel subtractor needs how many Full Adders?

Ans

✗ A. 14

✔ B. 12

✗ C. 18

✗ D. 16

Question ID : **8970321676**
Status : **Answered**
Chosen Option : **2**

Q.35 The minimum number of flip-flops needed to build a modulo-14 counter is:

Ans

✗ A. 6

✗ B. 7

✔ C. 4

✗ D. 5

Question ID : **8970321686**
Status : **Answered**
Chosen Option : **3**

Q.36 The internal impedance of a power source is $(3 + 4i)\ \Omega$. Maximum power transfer occurs when the load impedance Z_L is equal to:

Ans

✗ A. $(3 + 4i)\ \Omega$

✔ B. $(3 - 4i)\ \Omega$

✗ C. $0\ \Omega$

✗ D. ∞

Question ID : **8970321616**
Status : **Answered**
Chosen Option : **2**

Q.37 The rank of the matrix $B = \begin{bmatrix} -2 & 4 & -6 \\ 1 & -2 & 3 \end{bmatrix}$ is:

Ans

✗ A. 2

✗ B. 6

✔ C. 1

✗ D. 4

Question ID : **8970321601**

Status : **Answered**
Chosen Option : **3**

Q.38 A binary number system with 2n bits, all of which are 1s has the value.

Ans

✔ A. $2^{2n} - 1$

✘ B. 2^{2n}

✘ C. $2^{2n} + 1$

✘ D. $2 \times 2^{n-1}$

Question ID : **8970321669**
Status : **Not Answered**
Chosen Option : **--**

Q.39 The transfer function of a first order RC lowpass filter is:

Ans

✘ A. $\frac{1}{sRC}$

✘ B. $R + sC$

✘ C. $1 + sRC$

✔ D. $\frac{1}{(1+sRC)}$

Question ID : **8970321623**
Status : **Answered**
Chosen Option : **4**

Q.40 The VSWR is given by:

Ans

✔ A. $\frac{V_{max}}{V_{min}}$

✘ B. $\frac{V_r}{V_i}$

✘ C. $\frac{V_i}{V_r}$

✘ D. $\frac{V_{min}}{V_{max}}$

Question ID : **8970321741**
Status : **Answered**
Chosen Option : **1**

Q.41 The poles of an oscillator are:

Ans

✔ A. lie on the imaginary axis.

✘ B. lie on unit circle centered at origin in s-plane

✘ C. lie on the left half of s-plane.

✘ D. lie on the right half of s-plane.

Question ID : **8970321634**

Status : **Answered**
Chosen Option : **1**

Q.42 A (7, 4) Hamming Code contains _____ parity bits.

Ans

✗ A. 4
✗ B. 2
✓ C. 3
✗ D. 1

Question ID : **8970321727**
Status : **Answered**
Chosen Option : **3**

Q.43 In an OPAMP Wien Bridge Oscillator two pairs of R and C are used, when the frequency of oscillation is 200kHz. If the value of C is 10pF, find the value of R.

Ans

✗ A. 59.98 kΩ
✓ B. 79.58 kΩ
✗ C. 88.67 kΩ
✗ D. 68.87 kΩ

Question ID : **8970321665**
Status : **Answered**
Chosen Option : **2**

Q.44 Two random variable X and Y are totally uncorrelated if ρ_{XY}:

Ans

✗ A. 1.0
✗ B. ∞
✗ C. Negative
✓ D. 0

Question ID : **8970321706**
Status : **Answered**
Chosen Option : **3**

Q.45 In a Common Drain (CD) MOSFET amplifier with voltage divider bias with R_1 and R_2 equal to 1.5 MΩ and 1 MΩ respectively, the input impedance Z_i is:

Ans

✗ A. 220 kΩ
✓ B. 600 kΩ
✗ C. 470 kΩ
✗ D. 200 kΩ

Question ID : **8970321650**
Status : **Answered**
Chosen Option : **2**

Q.46 There are 4 variables in the Boolean function and the value of the function is 1. Find the number of cells in the K-Map which will contain a 1 when SOP expression is used.

Ans

✗ A. 12

✗ B. 0

✓ C. 16

✗ D. 14

Question ID : **8970321673**
Status : **Answered**
Chosen Option : **3**

Q.47 The characteristic impedance of free space is:

Ans

✗ A. 477 Ω

✓ B. 377 Ω

✗ C. 277 Ω

✗ D. 120 Ω

Question ID : **8970321744**
Status : **Answered**
Chosen Option : **2**

Q.48 The reason for using a precision OPAMP based rectifier diode for detecting weak AM signals is that.

Ans

✗ A. the demodulation is easy

✗ B. the signal is amplified and power is less.

✗ C. the noise is less and easy to filter

✓ D. the cut-in voltage of the diode is reduced.

Question ID : **8970321714**
Status : **Answered**
Chosen Option : **2**

Q.49 In an RC network having 3 loops, the size of the plant matrix A is:

Ans

✓ A. 3×3

✗ B. 4×4

✗ C. 6×6

✗ D. 5×5

Question ID : **8970321696**
Status : **Not Answered**
Chosen Option : **--**

Q.50 If a modulating signal with frequency f_m amplitude modulates a carrier of frequency f_c (where $f_c >> f_m$), the frequencies present at the output of AM is (with carrier).

Ans

✓ A. f_c , $f_c \pm f_m$

✗ B. $\pm f_m$ only

✗ C. $f_c + 2 f_m$

✗ D. $f_c - f_m$ only

Question ID : **8970321710**
Status : **Answered**
Chosen Option : **1**

Q.51 If $x[n] \leftrightarrow X(z)$, the z-transform of $x[-n]$ will be:

Ans

✗ A. $X\left(-\frac{1}{z}\right)$

✗ B. $X\left(-\frac{1}{z}\right)$

✗ C. $X(-z)$

✓ D. $X\left(\frac{1}{z}\right)$

Question ID : **8970321629**
Status : **Answered**
Chosen Option : **4**

Q.52 The hamming distance between two code words C1=[1011 0101] and C2=[0111 1010] is:

Ans

✗ A. 4

✗ B. 5

✗ C. 3

✓ D. 6

Question ID : **8970321726**
Status : **Answered**
Chosen Option : **4**

Q.53 In a parallel circuit having two resistances 4 Ω and 6 Ω connected across a DC voltage of 12 V, the current through the 4 Ω resistance is:

Ans

✗ A. 5 A

✗ B. 2 A

✓ C. 3 A

✗ D. 1 A

Question ID : **8970321614**
Status : **Answered**
Chosen Option : **3**

Q.54 The Marconi antenna has a physical length of:

Ans

✗ A. $\frac{\lambda}{2}$

✓ B. $\frac{\lambda}{4}$

✗ C. λ

✗ D. $\frac{\lambda}{8}$

Question ID : **8970321739**
Status : **Marked For Review**

Chosen Option : **4**

Q.55 In the state variable model of a system, the square matrix $\phi(t)$ that converts the initial states of the system x(0) to a new state x(t) at a later time t is called:

Ans

✗ A. controller matrix

✗ B. process matrix

✓ C. state transition matrix

✗ D. plant matrix

Question ID : **8970321704**
Status : **Answered**
Chosen Option : **3**

Q.56 For rms 100 value triangular wave, the peak voltage will be:

Ans

✓ A. 173 V

✗ B. 141 V

✗ C. 111 V

✗ D. 100 V

Question ID : **8970321617**
Status : **Answered**
Chosen Option : **1**

Q.57 The characteristic polynomial of a fourth-order feedback system is given by $A(s) = s^4 + 3s^3 + 7s^2 + 10$. Based on the Routh array of the system we can conclude that:

Ans

✗ A. The systems is stable.

✓ B. The system is unstable.

✗ C. The system is quasi-stable.

✗ D. The system is oscillatory.

Question ID : **8970321633**
Status : **Answered**
Chosen Option : **2**

Q.58 $\int e^{ax}\, dx$ is equal to:

Ans

✗ A. $\frac{1}{a}e^{-ax} - c$

✗ B. $e^{-ax} + c$

✓ C. $\frac{1}{a}e^{ax} + c$

✗ D. $e^{ax} + c$

Question ID : **8970321604**
Status : **Answered**
Chosen Option : **3**

Q.59 The percent bandwidth of an antenna with an optimum frequency of operation of 500MHz and -3dB frequencies of 475MHz and 525MHz is:

Ans
✗ A. 25%
✗ B. 50%
✗ C. 20%
✓ D. 10%

Question ID : **8970321743**
Status : **Answered**
Chosen Option : **4**

Q.60 In a NPN transistor, if the base current is 100 μA and the current gain, β = 200, the collector current will be:

Ans
✗ A. 2 mA
✗ B. 100 mA
✗ C. 10 mA
✓ D. 20 mA

Question ID : **8970321644**
Status : **Answered**
Chosen Option : **4**

Q.61 The general solution of the second order ODE $y'' + y' + 0.25y = 0$ is:

Ans
✗ A. $y = c_1 x + c_2 x^2 e^{-0.5x}$
✓ B. $(c_1 + c_2 x)e^{-0.5x}$
✗ C. $y = c_1 + c_2 x^2 e^{-0.5x}$
✗ D. $(c_1 + c_2 x^2)e^{-0.5x}$

Question ID : **8970321603**
Status : **Answered**
Chosen Option : **2**

Q.62 A game consists of flipping a fair coin twice and then rolling three fair dice. What is the total number of outcomes in the game?

Ans
✗ A. 768
✗ B. 892
✓ C. 864
✗ D. 862

Question ID : **8970321611**
Status : **Not Answered**
Chosen Option : **--**

Q.63 In the digital T1 carrier PCM telephony, the data rate is:

Ans
✓ A. 1.544Mbps
✗ B. 1.866Mbps
✗ C. 2.176Mbps
✗ D. 8.000Mbps

Question ID : **8970321728**
Status : **Answered**
Chosen Option : **1**

Q.64 A BJT differential amplifier with matched transistors is having h_{fe} of 200 and h_{ie} of 1.2kΩ and R_C of 3.3kΩ. Find the differential gain, A_V.

Ans

✗ A. -350
✗ B. 300
✓ C. -275
✗ D. 295

Question ID : **8970321660**
Status : **Answered**
Chosen Option : **3**

Q.65 An OPAMP RC phase shift oscillator has three pairs of R and C, where R=33kΩ. If the frequency of oscillation is 100kHz, find the value of C.

Ans

✗ A. 150.28 pF
✗ B. 212.54 pF
✓ C. 196.89 pF
✗ D. 168.89 pF

Question ID : **8970321664**
Status : **Answered**
Chosen Option : **3**

Q.66 The wavelength of a wave with a propagation constant, $0.2\pi+j0.4\pi$ is:

Ans

✗ A. 2m
✗ B. 1m
✗ C. 8m
✓ D. 5m

Question ID : **8970321735**
Status : **Answered**
Chosen Option : **4**

Q.67 An antenna with radiation resistance 330 Ω operates at 1 GHz and with a current of 4 A. Find the radiated power.

Ans

✗ A. 4800 W
✓ B. 5280 W
✗ C. 6100 W
✗ D. 6200 W

Question ID : **8970321738**
Status : **Answered**
Chosen Option : **2**

Q.68 The R.O.C. of the z-transform of the sequence $a^n u[n]$ is:

Ans
✗ A. $|z| < |a|$
✗ B. $|z| = \infty$
✓ C. $|z| > |a|$
✗ D. $|z| = |a|$

Question ID : **8970321635**
Status : **Answered**
Chosen Option : **3**

Q.69 A*B*A, where * represents XOR, is equal to:

Ans
✓ A. B
✗ B. ABA
✗ C. $\bar{A}$
✗ D. A

Question ID : **8970321670**
Status : **Answered**
Chosen Option : **1**

Q.70 The number of states a 8-bit ripple counter has is:

Ans
✓ A. 256
✗ B. 64
✗ C. 16
✗ D. 8

Question ID : **8970321685**
Status : **Answered**
Chosen Option : **1**

Q.71 Mobilities of free electrons and holes in pure Ge are 0.38 and 0.18 m^2 /V s, respectively. Assume n_i for Ge $= 2.5 \times 10^{19} m^{-3}$. Calculate the intrinsic resistivity of Ge. Take q $= 1.6 \times 10^{19}$ Coul.

Ans
✗ A. 0.786 Ωm
✗ B. 0.846 Ωm
✓ C. 0.446 Ωm
✗ D. 0.946 Ωm

Question ID : **8970321641**
Status : **Answered**
Chosen Option : **3**

Q.72 The solution to the first order ordinary differential equation y'=y is

Ans
✗ A. $y = cx^2$
✗ B. $y = cx$
✓ C. $y = ce^x$

✗ D. $y = c \times \ln x$

Question ID : **8970321602**
Status : **Answered**
Chosen Option : **3**

Q.73 A discrete time, which is both linear and time invariant, the impulse response is u[n]. What is the response of the system for an input $\delta[n-4]$?

Ans

✗ A. $u[n-2]$

✓ B. $u[n-4]$

✗ C. $u[n+2]$

✗ D. $u[n+4]$

Question ID : **8970321636**
Status : **Answered**
Chosen Option : **2**

Q.74 A signal with frequency f_m modulates a carrier f_c (where $f_c >> f_m$), then the output of the AM –DSBSC signal will contain frequencies.

Ans

✗ A. $2f_c$, $f_c \pm f_m$

✗ B. f_c , $f_c \pm 2f_m$

✓ C. $f_c \pm f_m$

✗ D. f_c , $f_c \pm f_m$

Question ID : **8970321713**
Status : **Answered**
Chosen Option : **3**

Q.75 For the base bias circuit, $R_B = 470\text{k}\Omega$, $R_C = 2.2\text{k}\Omega$, and $V_{CC} = 18\text{V}$ and the transistor has an h_{FE} of 100. Find V_{CE} .

Ans

✗ A. 8.548 V

✗ B. 10.246 V

✗ C. 12.602 V

✓ D. 9.902 V

Question ID : **8970321652**
Status : **Answered**
Chosen Option : **2**

Q.76 Find the effective area of a half-wave dipole at 1GHz.

Ans

✓ A. $0.0118\,m^2$

✗ B. $0.0414\,m^2$

✗ C. $0.0318\,m^2$

✗ D. $0.0218\,m^2$

Question ID : **8970321737**
Status : **Not Answered**
Chosen Option : **--**

Q.77 $\int \frac{1}{x} dx$ is equal to:

Ans
- ✗ A. $-\ln x^2 + c$
- ✗ B. $ln\,|2x| + c$
- ✓ C. $ln\,|x| + c$
- ✗ D. $-ln\,x + c$

Question ID : **8970321605**
Status : **Answered**
Chosen Option : **4**

Q.78 Let $z_1 = 4 + 7i$ and $z_2 = 7 - 2i$, then $z_1 + z_2$ will be:

Ans
- ✗ A. $12 + 5i$
- ✗ B. $11 + 6i$
- ✓ C. $11 + 5i$
- ✗ D. $12 + 4i$

Question ID : **8970321608**
Status : **Answered**
Chosen Option : **3**

Q.79 Check the system with characteristic equation $F(s) = s^4 + 3s^3 + 2s^2 + s + 1$ for stability.

Ans
- ✗ A. quasi-stable
- ✗ B. Oscillatory
- ✓ C. Unstable
- ✗ D. Stable

Question ID : **8970321693**
Status : **Answered**
Chosen Option : **3**

Q.80 The forward transfer function $G(s) = \frac{20}{(s^3+2s^2+4s)}$ and the feedback gain $H(s) = -0.8$. Find the closed loop transfer function of the SFG.

Ans
- ✗ A. $\frac{20s}{(s^3+2s^2+4s+16)}$
- ✗ B. $\frac{20}{(s^3+2s^2+4s+20)}$
- ✓ C. $\frac{20}{(s^3+2s^2+4s+16)}$
- ✗ D. $\frac{20s}{(s^3+2s^2+4s+20)}$

Question ID : **8970321700**
Status : **Answered**
Chosen Option : **3**

Q.81 The minimum number of flip-flops needed for a divide by 42 ripple counter is:

Ans

✗ A. 7

✗ B. 4

✗ C. 5

✓ D. 6

Question ID : **8970321687**
Status : **Answered**
Chosen Option : **4**

Q.82 The magnitude of reflection coefficient is:

Ans

✗ A. $|\rho|=\frac{V_{max}}{V_{min}}$

✓ B. $|\rho|=\frac{(VSWR-1)}{(VSWR+1)}$

✗ C. $|\rho|=\frac{(VSWR+1)}{(VSWR-1)}$

✗ D. $|\rho|=\frac{|V_i|}{|V_r|}$

Question ID : **8970321742**
Status : **Answered**
Chosen Option : **2**

Q.83 In a CDMA system there are 32 simultaneous users in the system. Find the number of different codes used.

Ans

✗ A. 48

✗ B. 36

✓ C. 32

✗ D. 52

Question ID : **8970321729**
Status : **Answered**
Chosen Option : **3**

Q.84 A particular sample of n-type Germanium has a resistivity of 0.1Ωm at 300K. Calculate the donor concentration. Take $\mu_n = 0.38$ and $q = 1.6 \times 10^{-19}$ Coul.

Ans

✗ A. $1.24 \times 10^{20} m^{-3}$

✓ B. $1.64 \times 10^{20} m^{-3}$

✗ C. $1.84 \times 10^{20} m^{-3}$

✗ D. $1.44 \times 10^{20} m^{-3}$

Question ID : **8970321640**
Status : **Answered**
Chosen Option : **2**

Q.85 In a standard AM super heterodyne receiver if the IF is 455kHz and the high-side tuning is used, the local oscillator frequency must vary between:

Ans

✗ A. 885kHz-1585kHz

✗ B. 85kHz-1145kHz

✓ C. 995kHz-2055kHz

✗ D. 88kHz-108kHz

Question ID : **8970321716**
Status : **Answered**
Chosen Option : **3**

Q.86 The noise figure of an antenna is expressed as:

Ans

✗ A. $1-\left(\frac{T_e}{T_0}\right)$

✗ B. $1+\left(\frac{T_e}{T_0}\right)^2$

✗ C. $\frac{T_e}{T_0}$

✓ D. $1+\left(\frac{T_e}{T_0}\right)$

Question ID : **8970321746**
Status : **Answered**
Chosen Option : **4**

Q.87 Calculate the value of I_E for a BJT with $\alpha_{dc} = 0.99$ and $I_B = 0.99$.

Ans

✗ A. 8.0 mA

✗ B. 5.0 mA

✓ C. 4.0 mA

✗ D. 9.9 mA

Question ID : **8970321657**
Status : **Answered**
Chosen Option : **4**

Q.88 The size of the Parity Check Matrix of a (7,4) Hamming Code is:

Ans

✗ A. 3×4

✗ B. 4×3

✓ C. 3×7

✗ D. 4×7

Question ID : **8970321723**
Status : **Answered**
Chosen Option : **3**

Q.89 In an angle modulation system, if the carrier amplitude is A_C, the power in the modulated signal Is:

Ans

✓ A. $0.5\times A\,c^2$

✗ B. $0.5\times A\,c^4$

✗ C. $1.5\times A\,c^2$

✗ D. $2.5 \times A c^2$

Question ID : **8970321715**
Status : **Answered**
Chosen Option : **1**

Q.90 An OPAMP RC phase shift oscillator has three pairs of R and C (R=22kΩ, C=10pF). Find the frequency of oscillation.

Ans

✗ A. 356.12 kHz
✗ B. 312.98 kHz
✗ C. 512.62 kHz
✓ D. 295.34 kHz

Question ID : **8970321663**
Status : **Answered**
Chosen Option : **4**

Q.91 A single Decimal-to-BCD encoder has _____ outputs.

Ans

✓ A. 4
✗ B. 10
✗ C. 8
✗ D. 5

Question ID : **8970321680**
Status : **Answered**
Chosen Option : **1**

Q.92 In 512 QAM, the number of signal vectors of the signal constellation is:

Ans

✗ A. 820
✗ B. 144
✓ C. 512
✗ D. 128

Question ID : **8970321722**
Status : **Not Answered**
Chosen Option : **--**

Q.93 A diode with $V_F = 0.7$ V is connected as a half wave rectifier. The load resistance is 500Ω and the rms AC input is 22 V. Find the peak output voltage.

Ans

✗ A. 32.2 V
✗ B. 34.1 V
✓ C. 30.4 V
✗ D. 22.0 V

Question ID : **8970321655**
Status : **Answered**
Chosen Option : **3**

Q.94 If $f_1(t) = f_2(t) = u(t)$, find out $f_1(t) * f_2(t)$: convolution of $f_1(t)$ and $f_2(t)$.

Ans

✗ A. u(t)

✗ B. f_2 u(t)

✓ C. tu(t)

✗ D. tδ(t)

Question ID : **8970321619**
Status : **Answered**
Chosen Option : **3**

Q.95 Find the locations of any two roots of the characteristic equation $F(s) = s^4 + 2s^3 + 11s^2 + 18s + 18 = 0$.

Ans

✗ A. ±J9

✓ B. ±j3.

✗ C. 0, 9

✗ D. +j9, -j2

Question ID : **8970321692**
Status : **Answered**
Chosen Option : **2**

Q.96 Let $z_1 = 2 + 3i$ *and* $z_2 = 4 - 2i$, *then* $z = \frac{z_1}{z_2}$ will be:

Ans

✗ A. $\frac{2}{5} - \frac{1}{3}i$

✓ B. $\frac{1}{10} + \left(\frac{4}{5}\right)$i

✗ C. $\frac{2}{5} + \frac{1}{3}i$

✗ D. $\frac{1}{10} - \left(\frac{4}{5}\right)$i

Question ID : **8970321609**
Status : **Answered**
Chosen Option : **2**

Q.97 The number of bits used in a 4096 level PCM system is:

Ans

✓ A. 12

✗ B. 16

✗ C. 20

✗ D. 10

Question ID : **8970321719**
Status : **Answered**
Chosen Option : **1**

Q.98 For zero degree phase shift, high input impedance, and low output impedance one should employ.

Ans

✗ A. Common Emitter (CE) configuration

✗ B. Open Collector (OC) configuration

✗ C. Common Base (CB) configuration

✓ D. Common Collector (CC) configuration

Question ID : **8970321658**
Status : **Answered**
Chosen Option : **4**

Q.99 The number of select lines S needed to select one out of n input lines is:

Ans

✗ A. $s = log\ n$

✗ B. $s = 2^n$

✗ C. $s = log_e n$

✓ D. $s = log_2 n$

Question ID : **8970321683**
Status : **Answered**
Chosen Option : **4**

Q.100 The contents of the register pair DE after the execution of the following Intel 8085 instructions, is:

PUSH H; PUSH D; POP H; POP D

Ans

✓ A. [H]→[D] ; [L]→[E]

✗ B. [A]→[D] ; [B]→[E]

✗ C. [H]→[D] ; [A]→[E]

✗ D. [L]→[D] ; [H]→[E]

Question ID : **8970321690**
Status : **Not Answered**
Chosen Option : **--**

Q.101 The zeros of the transfer function $T(s) = \left[\frac{(s+2)(s+5)}{(s+3)(s+7)}\right]$ are:

Ans

✗ A. $s = -5\ and\ s = -7$

✗ B. $s = 5\ and\ s = 7$

✓ C. $s = -2\ and\ s = -3$

✗ D. $s = 2\ and\ s = 3$

Question ID : **8970321622**
Status : **Answered**
Chosen Option : **3**

Q.102 A simple single OPAMP inverting amplifier has $R_F = 220\text{k}\Omega$ and $R_1 = 10\text{k}$. If two such stages are cascaded, find the mid frequency gain of the cascade.

Ans

✓ A. 53.70 dB

✗ B. -53.70 dB

✗ C. -26.85 dB

✗ D. 26.85 dB

Question ID : **8970321661**
Status : **Answered**
Chosen Option : **1**

Q.103 For the vector a with initial point P (4,0,2) and terminal point Q (6,-1,2), the value of $|a|$ will be:

Ans

✗ A. $\sqrt{3}$

✗ B. $\sqrt{7}$

✓ C. $\sqrt{5}$

✗ D. $\sqrt{2}$

Question ID : **8970321607**
Status : **Answered**
Chosen Option : **3**

Q.104 A second order RC lowpass filter is using OPAMP and two pairs of R and C. If the cutoff frequency is 2.2kHz, and the value of capacitance is 22 nF, find the value of R.

Ans

✗ A. 4.7 k

✓ B. 3.3 k

✗ C. 2.2 k

✗ D. 1.0 k

Question ID : **8970321667**
Status : **Answered**
Chosen Option : **2**

Q.105 The directivity of a half-wave dipole antenna is:

Ans

✗ A. 1.246

✗ B. 1.333

✗ C. 1.534

✓ D. 1.644

Question ID : **8970321736**
Status : **Answered**
Chosen Option : **4**

Q.106 The relation between power spectral density S(f) and the total average power over 1Ω is:

Ans

✗ A. P = S(f)×B/2

✓ B. $P = \int_{-\infty}^{\infty} S(f)\,df$

✗ C. $P = \int_{-\infty}^{\infty} S(f)\exp(j\omega t)\,df$

✗ D. P = S(f) × B

Question ID : **8970321712**

Status : **Answered**
Chosen Option : **2**

Q.107 A 16-bit serial adder needs how many Full Adders?

Ans

✗ A. 3

✓ B. 1

✗ C. 2

✗ D. 0

Question ID : **8970321677**
Status : **Answered**
Chosen Option : **4**

Q.108 Express the following finite discrete time signal as the difference of two unit step sequences : $x[n] = 1, for\ 0 \leq n \leq 5$; and 0 otherwise.

Ans

✓ A. $u[n] - u[n-6]$

✗ B. $u[n-5] - u[n-6]$

✗ C. $u[n-6] - u[n-5]$

✗ D. $u[n] - u[n-5]$

Question ID : **8970321624**
Status : **Answered**
Chosen Option : **1**

Q.109 When the load impedance $Z_L = Z_0$, the VSWR is:

Ans

✗ A. 0

✗ B. ∞

✓ C. 1

✗ D. 10

Question ID : **8970321745**
Status : **Answered**
Chosen Option : **3**

Q.110 Calculate the value of I_E for a transistor that has $\alpha_{dc} = 0.98$ and $I_B = 100\ \mu A$.

Ans

✓ A. 5.0 mA

✗ B. 4.8 mA

✗ C. 4.9 mA

✗ D. 6.4 mA

Question ID : **8970321648**
Status : **Answered**
Chosen Option : **1**

Q.111 The gain of a single stage BJT amplifier in the Emitter follower configuration, when $R_c = 22k\Omega$ and $R_E = 2.2k\Omega$ is:

Ans

✗ A. 8.0

✓ B. 10.0

✗ C. 5.0

✗ D. 100.0

Question ID : **8970321654**
Status : **Answered**
Chosen Option : **2**

Q.112 In a typical optical fiber the refractive indices of the core and cladding are 1.49 and 1.48 respectively. Find the numerical aperture (NA) of the fiber.

Ans

✗ A. 0.1423

✗ B. 0.1563

✓ C. 0.1723

✗ D. 0.1823

Question ID : **8970321749**
Status : **Answered**
Chosen Option : **3**

Q.113 The output of a system with impulse response $\delta[n-2]$ to an input signal, $u[n+2]$ is:

Ans

✗ A. $u[n+2]$

✓ B. $u[n]$

✗ C. $u[n-2]$

✗ D. $u[n]-u[n-2]$

Question ID : **8970321625**
Status : **Answered**
Chosen Option : **2**

Q.114 How many different ways can a ten card hand be dealt from a standard 52 card deck, if order in which the cards are dealt is unimportant?

Ans

✗ A. ${}_{42}C_{10}$

✗ B. ${}_{42}P_{10}$

✓ C. ${}_{52}C_{10}$

✗ D. ${}_{52}P_{10}$

Question ID : **8970321612**
Status : **Not Answered**
Chosen Option : **--**

Q.115 In a ASK system, the amplitude of the carrier signal is 10V and the binary to be transmitted is {1,0,1,1,1,1,0,0,…}. The amplitude of the output will be:

Ans

✗ A. $\{\pm 5V, 0, \pm 5V, \pm 5V, \pm 5V, \pm 5V, 0, 0, \ldots\}$

✗ B. $\{0, \pm 10V, 0, 0, 0, 0, \pm 10V, \pm 10V, \ldots\}$

✓ C. $\{\pm 10V, 0, \pm 10V, \pm 10V, \pm 10V, \pm 10V, 0, 0, \ldots\}$

✗ D. $\{\pm 1V, 0, \pm 1V, \pm 1V, \pm 1V, \pm 1V, 0, 0, \ldots\}$

Question ID : **8970321720**

Status : **Answered**
Chosen Option : **3**

Q.116 For a discrete LTI system, the impulse response is u[n]. What is its step response?

Ans

✗ A. $nu[n-1]$

✗ B. $n^2\mathrm{u}[\mathrm{n}]$

✓ C. $nu[n]$

✗ D. $u[n]$

Question ID : **8970321637**
Status : **Answered**
Chosen Option : **3**

Q.117 The FSK the carrier frequency is switched between_____ extremes.

Ans

✗ A. 3

✗ B. 6

✓ C. 2

✗ D. 4

Question ID : **8970321721**
Status : **Answered**
Chosen Option : **3**

Q.118 What will be the resistivity of an n-type Germanium sample at 300K? The sample has a donor density of $N_d = 10^{20}$ atoms/m^3 . Assume all donors to be ionized and take $\mu_n = 0.38$ and $q = 1.6 \times 10^{-19}$ Coul.

Ans

✗ A. $0.194\ \Omega m$

✓ B. $0.164\ \Omega m$

✗ C. $0.184\ \Omega m$

✗ D. $0.124\ \Omega m$

Question ID : **8970321639**
Status : **Answered**
Chosen Option : **2**

Q.119 In a series RLC circuit, the output is taken across the capacitor C, and the input is applied across the resistor R and ground. Obtain the closed loop transfer function.

Ans

✗ A. $\frac{s}{(1+\mathrm{sRC}+s^2\mathrm{LC})}$

✗ B. $\frac{\mathrm{sC}}{(1+\mathrm{sRC}+s^2\mathrm{LC})}$

✗ C. $1 + \mathrm{sRC} + s^2\mathrm{LC}$

✓ D. $\frac{1}{(1+\mathrm{sRC}+s^2\mathrm{LC})}$

Question ID : **8970321691**
Status : **Answered**
Chosen Option : **4**

Q.120 The autocorrelation function of a band limited (B) white noise process is given by.

Ans
✗ A. $R(\tau)=B \times N_0 \ \ln(2B\tau)$
✗ B. $R(\tau)=B \times N_0 \times \tau \times \sin(2B)$
✗ C. $R(\tau)=B \times N_0 \ \log(2B\tau)$
✓ D. $R(\tau)=B \times N_0 \ \text{sinc}(2B\tau)$

Question ID : **8970321709**
Status : **Answered**
Chosen Option : **4**

Q.121 The β of a transistor is 200, what is its α?

Ans
✗ A. 0.969
✗ B. 0.928
✗ C. 0.905
✓ D. 0.995

Question ID : **8970321653**
Status : **Answered**
Chosen Option : **4**

Q.122 The number of 4:1 MUXs needed to build a 16:1 MUX is:

Ans
✓ A. 5
✗ B. 3
✗ C. 6
✗ D. 4

Question ID : **8970321682**
Status : **Answered**
Chosen Option : **1**

Q.123 The eigen values of the matrix $A = \begin{bmatrix} 0 & a \\ 0 & 0 \end{bmatrix}$ are:

Ans
✗ A. $-a, a$
✗ B. ± 1
✗ C. ± 2
✓ D. 0

Question ID : **8970321606**
Status : **Answered**
Chosen Option : **4**

Q.124 A two stage capacitor coupled CE amplifier has stages having a voltage gain of 100 each. It is known that the gain of each stage drops by 3dB at lower cutoff frequency. What is the overall gain of the multistage amplifier at lower cutoff frequency?

Ans
✓ A. 74 dB
✗ B. 34 dB

✗ C. -74 dB

✗ D. -34 dB

Question ID : **8970321659**
Status : **Answered**
Chosen Option : **1**

Q.125 A combinational PLD with both programmable AND and OR arrays is called:

Ans

✓ A. PLA

✗ B. PAL

✗ C. RAM

✗ D. ROM

Question ID : **8970321684**
Status : **Answered**
Chosen Option : **1**

Q.126 The number of 3-to-8 decoders needed to wire up a 4-to-16 decoder is:

Ans

✗ A. 0

✓ B. 2

✗ C. 1

✗ D. 3

Question ID : **8970321681**
Status : **Answered**
Chosen Option : **2**

Q.127 The band gap in eV of Ge at 300K is:

Ans

✗ A. 1.68 eV

✓ B. 0.66 eV

✗ C. 0.56 eV

✗ D. 1.12 eV

Question ID : **8970321643**
Status : **Answered**
Chosen Option : **2**

Q.128 The received power of a RADAR receiving antenna whose effective area is 0.2 m^2 for an available power density of 200 $\mu W/m^2$ is:

Ans

✗ A. 400 µW

✓ B. 40 µW

✗ C. 500 µW

✗ D. 50 µW

Question ID : **8970321748**
Status : **Answered**
Chosen Option : **2**

Q.129 Find the inverse z-transform of $X(z) = \frac{1}{(1-0.25z^{-1})}$.

Ans

✗ A. $\left(\frac{1}{4}\right)^n u[-n+1]$

✗ B. $\left(\frac{1}{2}\right)^n u[n]$

✓ C. $\left(\frac{1}{4}\right)^n u[n]$

✗ D. $\left(\frac{1}{2}\right)^{-n} u[-n]$

Question ID : **8970321631**
Status : **Answered**
Chosen Option : **3**

Q.130 The root loci originate at _____ of the open loop transfer function.

Ans

✗ A. Origin

✗ B. break-away points

✗ C. Zeros

✓ D. Poles

Question ID : **8970321694**
Status : **Answered**
Chosen Option : **2**

Q.131 Find the peak-to-peak ripple voltage of half-wave rectifier and filter circuit which has a 680μF filter capacitor, an average output voltage of 30V, and a 220Ω load resistance. The mains frequency is 50Hz.

Ans

✗ A. 3.51 V

✓ B. 4.01 V

✗ C. 3.83 V

✗ D. 2.84 V

Question ID : **8970321656**
Status : **Answered**
Chosen Option : **2**

Q.132 The uniform plane wave is:

Ans

✗ A. vertically directed

✗ B. neither longitudinal nor transverse

✗ C. longitudinal in nature

✓ D. transverse in nature

Question ID : **8970321731**
Status : **Answered**
Chosen Option : **4**

Q.133 The transfer function $H(s) = \frac{1}{(s+1)}$ is that of a:

Ans
✗ A. Bandpass filter
✓ B. Lowpass filter
✗ C. Highpass filter
✗ D. Bandreject filter

Question ID : **8970321632**
Status : **Answered**
Chosen Option : **2**

Q.134 A block of Silicon is doped with a donor atom density $N_D = 3 \times 10^{14} \text{atoms}/cm^3$, and with an acceptor density of $N_A = 0.5 \times 10^{14} \text{atoms}/cm^3$. Find the resultant density of electrons.

Ans
✗ A. $4.5 \times 10^{14} \text{electrons}/cm^3$
✗ B. $3.5 \times 10^{14} \text{electrons}/cm^3$
✓ C. $2.5 \times 10^{14} \text{electrons}/cm^3$
✗ D. $5.5 \times 10^{14} \text{electrons}/cm^3$

Question ID : **8970321651**
Status : **Answered**
Chosen Option : **3**

Q.135 There are 3 variables in the Boolean function and the value of the function is 0. Find the number of cells in the K-Map which will contain a 0 when SOP expression is used.

Ans
✓ A. 8
✗ B. 2
✗ C. 4
✗ D. 0

Question ID : **8970321674**
Status : **Answered**
Chosen Option : **1**

Q.136 Find the channel capacity of the noiseless discrete channel, with n symbols; x_1, x_2, x_3, ..., x_n.

Ans
✗ A. C= log_2 4n
✗ B. C= log_2 2n
✗ C. C= $log_2 n^2$
✓ D. C= log_2 n

Question ID : **8970321724**
Status : **Marked For Review**
Chosen Option : **4**

Q.137 A power factor of 1.0 indicates:

Ans
✗ A. purely inductive circuit

✗ B. purely capacitive circuit

✓ C. purely resistive circuit

✗ D. purely reactive circuit

Question ID : **8970321618**
Status : **Answered**
Chosen Option : **3**

Q.138 If both fast response time and good steady state accuracy are needed _____ compensators are used.

Ans

✗ A. Fast

✗ B. Lead

✗ C. Lag

✓ D. lag-lead

Question ID : **8970321703**
Status : **Answered**
Chosen Option : **4**

Q.139 The Accumulator will contain _____ after the execution of the following instructions in an Intel 8085 Microprocessor:
MVI A, 7FH; MVI B, AAH; XRA B.

Ans

✗ A. DFH

✗ B. AFH

✗ C. 00H

✓ D. D5H

Question ID : **8970321689**
Status : **Answered**
Chosen Option : **4**

Q.140 If the Fourier transform of f(t) is $F(\omega)$ then Fourier transform of f(at) is:

Ans

✓ A. $\frac{1}{|a|} \times F\frac{\omega}{a}$

✗ B. $aF(\omega)$

✗ C. $F(a\omega)$

✗ D. $F\frac{\omega}{a}$

Question ID : **8970321620**
Status : **Answered**
Chosen Option : **1**

Q.141 The half power beam width of 2m parabolic reflector used at 5GHz is …

Ans

✗ A. 0.1°

✗ B. 1.1°

✗ C. 3.1°

✓ D. 2.1°

Question ID : **8970321747**
Status : **Answered**
Chosen Option : **4**

Q.142 The expression for Poynting's vector (rate of energy flow per unit area at any point) for EM wave is:

Ans

✔ A. $P=E\times H$

✘ B. $P=E^2\times H$

✘ C. $P=E/H$

✘ D. $P=E^2/H$

Question ID : **8970321730**
Status : **Answered**
Chosen Option : **1**

Q.143 Calculate the reverse resistance of a Si diode when the reverse voltage is 50 V and the current is 100 nA.

Ans

✔ A. 500 MΩ

✘ B. 100 MΩ

✘ C. 50 MΩ

✘ D. 600 MΩ

Question ID : **8970321646**
Status : **Answered**
Chosen Option : **1**

Q.144 A 8-bit synchronous counter uses flip-flops with a propagation delay of 25nsec each. The maximum possible time needed for change of state is:

Ans

✘ A. 125nsec

✔ B. 25nsec

✘ C. 100nsec

✘ D. 50nsec

Question ID : **8970321688**
Status : **Answered**
Chosen Option : **2**

Q.145 Find the transfer function of the state variable representation of the system given by the differential equation, y''+2y'+4y=8u.

Ans

✘ A. $\frac{4}{(s^2+2s+4)}$

✔ B. $\frac{8}{(s^2+2s+4)}$

✘ C. $\frac{2}{(s^2+2s+4)}$

✘ D. $\frac{6}{(s^2+2s+4)}$

Question ID : **8970321699**
Status : **Answered**
Chosen Option : **2**

Q.146 A 1N755 Zener diode is connected (in reverse biased mode) in series to a 620 Ω resistor and a 20 V DC supply. Calculate the diode current.

Ans

✔ A. 20.16 mA

✘ B. 12.16 mA

✘ C. 28.49 mA

✘ D. 30.12 mA

Question ID : **8970321647**
Status : **Answered**
Chosen Option : **4**

Q.147 The z-transform of $\left(\frac{1}{2}\right)^n u[n]$ is:

Ans

✘ A. $\frac{z}{(z-2)}$

✘ B. $\frac{(z-0.5)}{z(z+0.5)}$

✔ C. $\frac{z}{\left(\frac{z-1}{2}\right)}$

✘ D. $\frac{z}{0.5z}$

Question ID : **8970321630**
Status : **Answered**
Chosen Option : **3**

Q.148 The band gap in eV of Si at 300K is:

Ans

✘ A. 0.56 eV

✘ B. 1.68 eV

✘ C. 0.66 eV

✔ D. 1.12 eV

Question ID : **8970321642**
Status : **Answered**
Chosen Option : **4**

Q.149 The bandwidth of the optical signal having a rise time (response time) t_r is 500MHz. Find the value of rise time.

Ans

✘ A. 750pico-sec

✘ B. 900pico-sec

✘ C. 800pico-sec

✔ D. 700pico-sec

Question ID : **8970321750**
Status : **Answered**
Chosen Option : **4**

Q.150 An algorithm with three nested loops will have a Big-O efficiency of (a size on n).

Ans

✔ A. $O(n^3)$

✘ B. $O(3n)$

✘ C. $O(n^4)$

✘ D. $O(n^2)$

Question ID : **8970321610**
Status : **Not Answered**
Chosen Option : **--**

Section : **General Knowledge_Awareness**

Q.1 Which organization among the following was set up in 1982 to coordinate the activities of all institutions involved in the rural financing system?

Ans

✘ A. FCI

✘ B. SIDBI

✔ C. NABARD

✘ D. APEDA

Question ID : **8970321759**
Status : **Answered**
Chosen Option : **3**

Q.2 The athletes of which Indian state won 22 out of the 66 medals won by India at the 2018 Commonwealth Games (CWG 2018) in Gold Coast?

Ans

✔ A. Haryana

✘ B. Madhya Pradesh

✘ C. Maharashtra

✘ D. Punjab

Question ID : **8970321768**
Status : **Not Answered**
Chosen Option : **--**

Q.3 The 'Fit India movement' was launched by the Government of India in the month of _____.

Ans

✘ A. July

✔ B. August

✘ C. May

✘ D. June

Question ID : **8970321763**
Status : **Answered**
Chosen Option : **4**

Q.4 Arable land in the irrigated zones of India is becoming saline because of _____.

Ans

✘ A. Over Grazing

✔ B. Over-Irrigation

✗ C. Heavy rainfall

✗ D. Over use of pesticides

Question ID : **8970321756**
Status : **Not Answered**
Chosen Option : **--**

Q.5 In which Olympic game did first Indian woman Karnam Malleswari who win a bronze medal?

Ans

✗ A. Atlanta

✓ B. Sydney

✗ C. Seoul

✗ D. Moscow

Question ID : **8970321762**
Status : **Not Answered**
Chosen Option : **--**

Q.6 Sachin Tendulkar made his Test Cricket debut against the team of which one of the following nation?

Ans

✗ A. Sri Lanka

✓ B. Pakistan

✗ C. South Africa

✗ D. New Zealand

Question ID : **8970321761**
Status : **Not Answered**
Chosen Option : **--**

Q.7 What is the basic program used as an interface between the operating system and the motherboard?

Ans

✗ A. Dual In- Line Memory Module(DIMM)

✗ B. Advanced Technology Extended (ATX)

✓ C. Basic Input Output System (BIOS)

✗ D. Universal Serial Bus (USB)

Question ID : **8970321751**
Status : **Answered**
Chosen Option : **1**

Q.8 The Article 51A containing Fundamental Duties was inserted in the Constitution by the 42nd amendment in the year _____.

Ans

✗ A. 1964

✗ B. 1971

✓ C. 1976

✗ D. 1952

Question ID : **8970321757**
Status : **Answered**
Chosen Option : **3**

Q.9 Which schedule of the constitution was intended to protect land reform laws from being challenged in courts on the grounds of violation of fundamental rights?

Ans

✗ A. Schedule 5

✗ B. Schedule 7

✓ C. Schedule 9

✗ D. Schedule 3

Question ID : **8970321767**
Status : **Not Answered**
Chosen Option : **--**

Q.10 When was Saansad Adarsh Gram Yojana (SAGY) in which Members of India's Parliament need to identify and develop one village from their constituencies launched?

Ans

✓ A. 2014

✗ B. 2010

✗ C. 2013

✗ D. 2007

Question ID : **8970321760**
Status : **Not Answered**
Chosen Option : **--**

Q.11 In _____ Mahatma Gandhi organized a satyagraha to support the peasants of the Kheda district of Gujarat.

Ans

✗ A. 1915

✓ B. 1917

✗ C. 1916

✗ D. 1918

Question ID : **8970321753**
Status : **Marked For Review**
Chosen Option : **3**

Q.12 A devastating fire occurred in 2019 in the Amazon rainforests of which one of the following nations?

Ans

✗ A. USA

✗ B. Argentina

✗ C. Canada

✓ D. Brazil

Question ID : **8970321764**
Status : **Answered**
Chosen Option : **4**

Q.13 Which statdium in India is the second largest football stadium in the world?

Ans

✗ A. Wankhede Stadium

✗ B. Jawaharlal Nehru Stadium

✓ C. Salt Lake Stadium

✗ D. Eden Garden Stadium

Question ID : **8970321769**
Status : **Not Answered**
Chosen Option : **--**

Q.14 When was the Inland Emigration Act passed under which plantation workers were not permitted to leave the tea gardens without permission?

Ans
✔ A. 1859
✘ B. 1884
✘ C. 1887
✘ D. 1896

Question ID : **8970321754**
Status : **Not Answered**
Chosen Option : **--**

Q.15 A computer software that is sold and bundled with hardware is termed as _____.

Ans
✘ A. Retail Software
✘ B. Public Domain Software
✔ C. OEM Software
✘ D. Demo Software

Question ID : **8970321766**
Status : **Not Answered**
Chosen Option : **--**

Q.16 In a computer when the access time taken is less the speed of the memory is _____.

Ans
✔ A. Faster
✘ B. Inconsistent
✘ C. Slower
✘ D. Constant

Question ID : **8970321752**
Status : **Answered**
Chosen Option : **1**

Q.17 'Regur Soil' is the other name for which one of the following type of soil?

Ans
✘ A. Arid soil
✘ B. Laterite soil
✘ C. Alluvial soil
✔ D. Black soil

Question ID : **8970321755**
Status : **Answered**
Chosen Option : **2**

Q.18 What is the name of the joint military exercise between India and Thailand conducted between 16th to 29th September 2019?

Ans
✔ A. MAITREE

✗ B. PRATHAM
✗ C. PARIJAT
✗ D. GARGEE

Question ID : **8970321770**
Status : **Answered**
Chosen Option : **1**

Q.19 The '86th amendment of Constitution' in December 2002 led to inserting of which fundamental right?

Ans
✗ A. Property
✓ B. Education
✗ C. Equality
✗ D. Freedom

Question ID : **8970321758**
Status : **Answered**
Chosen Option : **2**

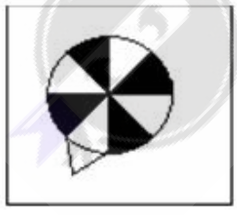
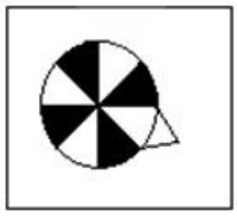
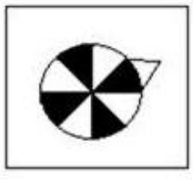
Q.20 How many years of rule has the Chinese Communist Party (CCP) completed its rule in 2019?

Ans
✗ A. 65 years
✗ B. 25 years
✗ C. 55 years
✓ D. 70 years

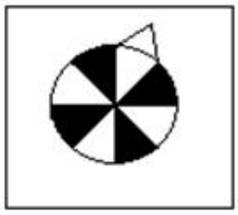
Question ID : **8970321765**
Status : **Not Answered**
Chosen Option : **--**

Section : **Reasoning_Apptitude**

Q.1 Three of the given options are similar in certain manner. Find the option which is odd.

Ans
✗ A. 
✗ B. 
✓ C. 

✗ D.



Question ID : **8970321790**
Status : **Answered**
Chosen Option : **3**

Q.2 Which of the following term is related to the term 'PRQS' in the same way as the term 'CEDK' is related to the term 'DFEG'?

Ans

✗ A. OPQV

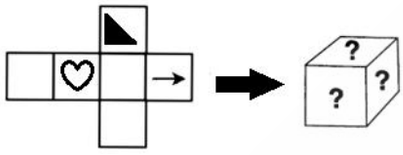
✗ B. QOPV

✗ C. PQOW

✓ D. OQPW

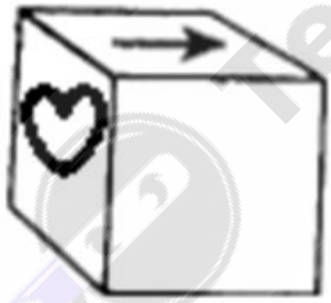
Question ID : **8970321782**
Status : **Answered**
Chosen Option : **4**

Q.3 Which of the following cubes will be formed when the given paper is folded to form a cube?

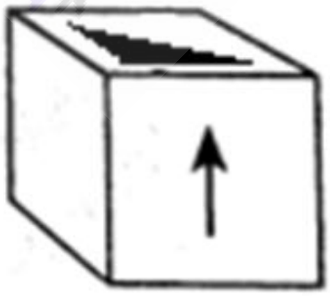


Ans

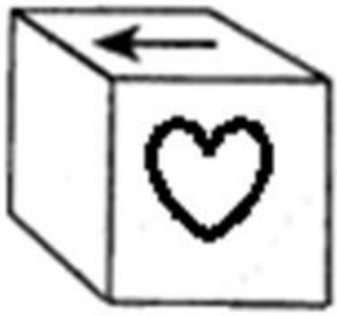
✗ A.



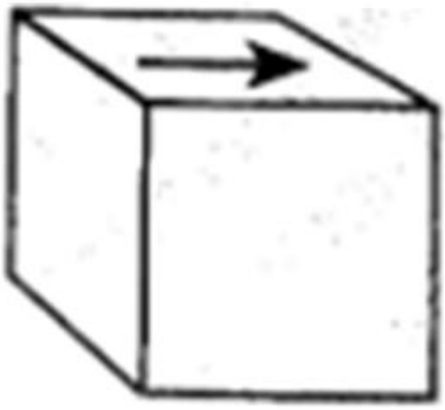
✗ B.



✗ C.



✓ D.



Question ID : **8970321785**
Status : **Answered**
Chosen Option : **4**

Q.4 Peter went in his car to meet his father. Starting from his office, he drove 35 km towards East, 15 km towards North, 35 km towards West and then 25 km South, where he met his father. How far and in which direction is Peter's office from the place he met his father?

Ans

✓ A. 10 km, North

✗ B. 18 km, East

✗ C. 15 km, South

✗ D. 20 Km, West

Question ID : **8970321783**
Status : **Answered**
Chosen Option : **1**

Q.5 Consider the two statements to be true even if they are at variation with the commonly known facts and decide which of the given conclusions logically follow from the statements.

Statements:
I. Some boys are pens.
II. All pens are fruits.

Conclusions:
A. No boy is a fruit.
B. Some pens are boys.

Ans

✗ A. Neither A nor B follows

✓ B. Only conclusion B follows

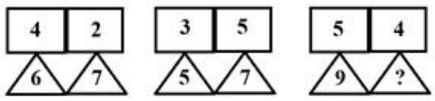
✗ C. Both A and B follow

✗ D. Only conclusion A follows

Question ID : **8970321776**
Status : **Answered**

Chosen Option : **2**

Q.6 Which of the following options can replace the question mark (?) correctly?



Ans

✗ A. 3

✗ B. 7

✗ C. 5

✓ D. 6

Question ID : **8970321773**
Status : **Not Answered**
Chosen Option : **--**

Q.7 Find out the pair in which the words bear the same relationship to each other as the words of the given pair.

Nun : Convent

Ans

✗ A. Shirt : Garment

✗ B. Expand : Condense

✓ C. Soldier : Barracks

✗ D. Fox : Vixen

Question ID : **8970321779**
Status : **Answered**
Chosen Option : **3**

Q.8 B is the son of R. S is the sister of T. P and Q are married to each other. Their only child R is married to S. A is the father of T. How is R related to A?

Ans

✗ A. Paternal uncle

✓ B. Son- in- law

✗ C. Paternal aunt

✗ D. Son

Question ID : **8970321781**
Status : **Answered**
Chosen Option : **2**

Q.9 In a certain coding language, 'mango is the king of fruit' is written as '@ $ % & H E'; 'the king lives in the palace' is written as '@ H U @ # !'; and 'Palace wise king' is written as 'G H #'. What is the code of 'the wise' in that language?

Ans

✗ A. # @

✗ B. ! H

✗ C. H G

✓ D. G @

Question ID : **8970321780**
Status : **Answered**
Chosen Option : **4**

Q.10 Identify the correct water image of the given figure.

REFRACTIVE

Ans

A. 

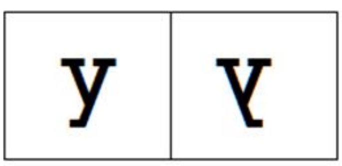
B. 

C. 

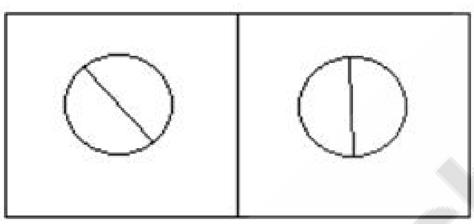
D. 

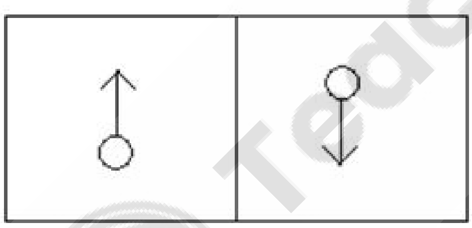
Question ID : **8970321784**
Status : **Answered**
Chosen Option : **2**

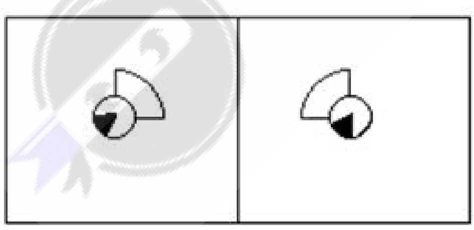
Q.11 Select the option with the pair that has a relationship similar to that in the pair given below.

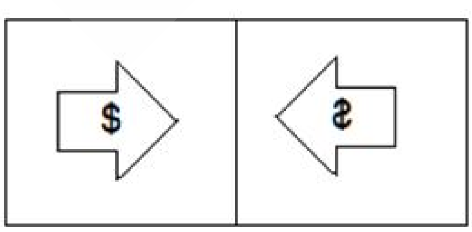


Ans

A. 

B. 

C. 

D. 

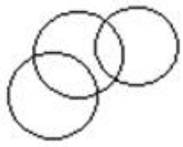
Question ID : **8970321789**
Status : **Answered**
Chosen Option : **4**

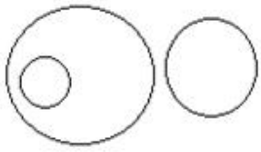
Q.12

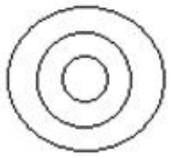
Select the option that correctly represents the relationship among the following:

Muscles, bones, blood

Ans

✗ A. 

✗ B. 

✗ C. 

✓ D. 

Question ID : **8970321786**
Status : **Answered**
Chosen Option : **4**

Q.13 Select the option that correctly represents the relationship among the following:

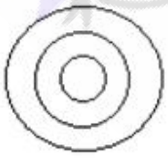
White, Colour, Blue

Ans

✗ A. 

✗ B. 

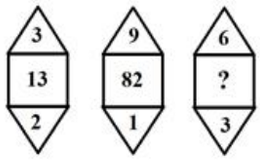
✓ C. 

✗ D. 

Question ID : **8970321788**
Status : **Answered**
Chosen Option : **3**

Q.14

Which of the following options can replace the question mark (?) correctly?



Ans

✗ A. 75

✗ B. 66

✓ C. 45

✗ D. 82

Question ID : **8970321772**
Status : **Answered**
Chosen Option : **3**

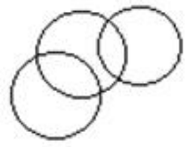
Q.15 Select the option that correctly represents the relationship among the following:

Children, Adults, Chair

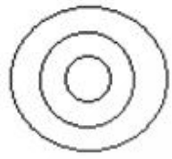
Ans

✗ A.

✗ B.



✗ C.



✓ D.

Question ID : **8970321787**
Status : **Answered**
Chosen Option : **4**

Q.16 P, Q, R, S, T and U are women. R is the only maternal aunt of S. P is sister in law of Q. Q is niece of R. T and R are the only children of U. How is T related to S?

Ans

✗ A. Aunt

✗ B. Niece

✓ C. Mother

✗ D. Sister

Question ID : **8970321777**
Status : **Answered**
Chosen Option : **3**

Q.17 Which of the following options can replace the question mark (?) correctly?

Y9Q, W20U, U42X, S86Z, ?

Ans

✗ A. P174B

✗ B. P174A

✗ C. Q172A

✓ D. Q174A

Question ID : **8970321775**
Status : **Answered**
Chosen Option : **3**

Q.18 Which of the given conclusions logically follows from the given statements?

Statements:
I. No fruits are boys.
II. No boys are tables.

Conclusion A: Some fruits are boys.
Conclusion B: Some boys are fruits.

Ans

✗ A. Both A and B follow

✓ B. Neither A nor B follows

✗ C. Only conclusion B follows

✗ D. Only conclusion A follows

Question ID : **8970321778**
Status : **Answered**
Chosen Option : **2**

Q.19 In an aircraft, there are 25 passengers and the following table shows the number of passengers and their corresponding weights.

No of passengers	4	5	6	5	3	2
Weight in kg	90	60	75	78	72	45

What is the approximate average weight of all the 25 passengers?

Ans

✗ A. 75 kg

✓ B. 71 kg

✗ C. 72 kg

✗ D. 67 kg

Question ID : **8970321771**
Status : **Answered**
Chosen Option : **3**

Q.20 Which of the following options can replace the question mark (?) correctly?

6, 13, 27, 55, 111, 223, ?

Ans
✔ A. 447
✘ B. 1579
✘ C. 1606
✘ D. 1098

Question ID : **8970321774**
Status : **Answered**
Chosen Option : **1**

Section : **General Hindi**

Q.1 'साँप मरे न लाठी टूटे' लोकोक्ति का सही अर्थ नीचे दिए विकल्पों में से चुनें।

Ans
✘ A. सदा एक सी दशा
✔ B. बिना बल प्रयोग के काम हो जाए
✘ C. शुरू में ही विघ्न पड़ गया
✘ D. कुछ सीखा पाया नहीं

Question ID : **8970321795**
Status : **Answered**
Chosen Option : **2**

Q.2 'कृतघ्न' शब्द के लिए उचित वाक्यांश चुनें।

Ans
✘ A. उपकार करने वाला
✔ B. किए हुए उपकार को भूल जाने वाला
✘ C. किए हुए उपकार को मानने वाला
✘ D. उपकार न करने वाला

Question ID : **8970321799**
Status : **Answered**
Chosen Option : **3**

Q.3 'अंक भरना' मुहावरे का सही अर्थ नीचे दिए विकल्पों में से चुनें।

Ans
✔ A. गले लगाना
✘ B. प्रसन्न हो जाना
✘ C. फुर्ती न रहना
✘ D. ढिठाई करना

Question ID : **8970321794**
Status : **Answered**
Chosen Option : **4**

Q.4 जहाँ उपमेय को उपमान से श्रेष्ठ बताया जाय और उसका कारण भी दिया जाय, वहाँ _____ अलंकार होता है।

Ans
✗ A. यमक
✓ B. व्यतिरेक
✗ C. श्लेष
✗ D. उपमा

Question ID : **8970321798**
Status : **Not Answered**
Chosen Option : **--**

Q.5 उदित उदय गिरि-मंच पर, रघुवर-बाल पतंग।
विकसे संत-सरोजवन, हरषे लोचन भृंग॥ - दोहे में कौन सा अलंकार है?

Ans
✗ A. प्रतीप
✓ B. रूपक
✗ C. उत्प्रेक्षा
✗ D. व्यतिरेक

Question ID : **8970321797**
Status : **Not Answered**
Chosen Option : **--**

Q.6 'नील गगन सा शांत हृदय था हो रहा।'- काव्य-पंक्ति में कौन सा अलंकार है?

Ans
✗ A. रूपक
✗ B. उदाहरण
✓ C. उपमा
✗ D. उत्प्रेक्षा

Question ID : **8970321796**
Status : **Answered**
Chosen Option : **3**

Q.7 'जिसे करना बहुत कठिन हो'- वाक्यांश के लिए उचित शब्द चुनें।

Ans
✗ A. दुर्बोध
✗ B. दुर्दम
✗ C. दुर्लभ
✓ D. दुष्कर

Question ID : **8970321800**
Status : **Answered**
Chosen Option : **2**

Q.8

निम्नलिखित में से कौन सा विकल्प सही विलोम-युग्म नहीं है?

Ans
✗ A. प्रथम-अंतिम
✓ B. प्रवर-प्रवृत्त
✗ C. प्रलय-सृष्टि
✗ D. प्रमुख-गौण

Question ID : **8970321792**
Status : **Answered**
Chosen Option : **2**

Q.9 दिए गए विकल्पों में से 'कोयल' का पर्यायवाची चुनें।

Ans
✓ A. पिक
✗ B. कवल
✗ C. वायस
✗ D. एकाक्ष

Question ID : **8970321793**
Status : **Answered**
Chosen Option : **2**

Q.10 निम्नलिखित विकल्पों में से कौन सा एक विकल्प शेष तीन का पर्यायवाची नहीं है?

Ans
✗ A. लोक
✗ B. जगत्
✓ C. विख्याति
✗ D. विश्व

Question ID : **8970321791**
Status : **Answered**
Chosen Option : **3**