Telangana State Power Generation Corporation Limited

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	Assistant Engineer Electronics 14th Jul 2024 Shift 3
Subject Name :	Assistant Engineer Electronics
Creation Date :	2024-07-14 19:34:57
Duration :	100
Total Marks :	100
Display Marks:	Yes
Change Font Color :	No
Change Background Color :	No
Change Theme :	No
Help Button :	No
Show Reports :	No
Show Progress Bar :	No

Assistant Engineer Electronics

Group Number :	1
Group Id :	1705276
Group Maximum Duration :	0
Group Minimum Duration :	100
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	100

Section A

Section Id :	17052711
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory

Question Number : 1 Question Id : 170527501 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0
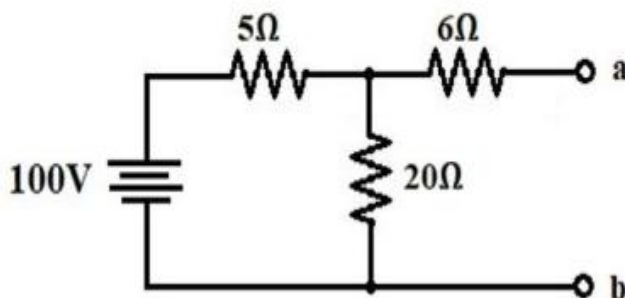
Find current I_1 in the following circuit

Options :

1. ✖ 2 A

2. ✖ 4.2 A

3. ✔ 12.8 A

4. ✖ 16 A

Question Number : 2 Question Id : 170527502 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Identify the resistor that draws a current of 5A when connected across terminals 'a' and 'b' of the circuit shown in figure below?

Options :

1. ✖ 4 Ω

2. ✖ 5 Ω

3. ✔ 6 Ω

4. ✖ 20 Ω

Question Number : 3 Question Id : 170527503 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A circuit reduced to a single equivalent capacitance C and a single equivalent resistance R will have a natural response given by $v(t) = v_0 e^{-t/\tau}$ where τ is
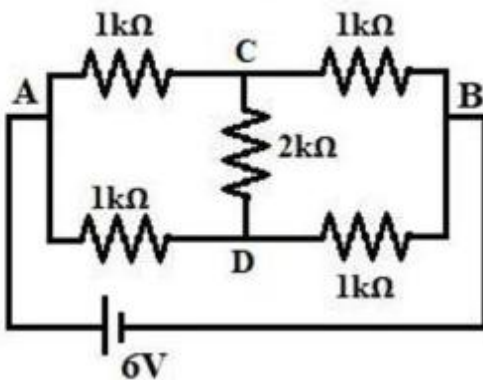
Options :

1. ✔ RC

2. ✖ R / C

3. ✖ C / R

4. ✖ 1 / RC

Question Number : 4 Question Id : 170527504 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The current through the 2kΩ resistance in the circuit shown in figure is

Options :

1. ✔ 0 mA

2. ✖ 1 mA

3. ✖ 3 mA

4. ✖ 6 mA

Question Number : 5 Question Id : 170527505 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Consider a parallel RLC circuit having an inductance of 10mH and a capacitance of 100μF. Determine the resistor value that would lead to overdamped response.

Options :

1. ✔ $R < 5\Omega$

2. ✘ $R > 5\Omega$

3. ✘ $R > 10\Omega$

4. ✘ $R > 100\Omega$

Question Number : 6 Question Id : 170527506 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The complex frequency $s = \sigma + jw$ is the general case; then which of the following is correct?

Options :

1. ✘ $s = \infty \to sinusoidal; \ w = \infty \to exponential; \ \sigma = 0 \ \to dc$

2. ✘ $s = \infty \to exponential; \ w = 0 \to dc; \ \sigma = \infty \ \to sinusoidal$

3. ✔ $s = 0 \to dc, \ w = 0 \to exponential; \ \sigma = 0 \ \to sinusoidal$

4. ✘ $s = 0 \to exponential, \ w = \infty \to sinusoidal; \ \sigma = 0 \ \to dc$

Question Number : 7 Question Id : 170527507 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

For the equation $\ddot{x}(t) + 3\dot{x}(t) + 2x(t) = 5$, the solution $x(t)$ approaches which of the following values as $t \to \infty$?

Options :

1. ✘ 0

2. ✔ $\dfrac{5}{2}$

3. ✘ 5

4. ✖ 10

Question Number : 8 Question Id : 170527508 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

$y(n) = x(n) - 2x(n-1) + x(n-2)$ is a good approximation to

Options :

1. ✔ HPF

2. ✖ BPF passing $\frac{\pi}{8} \leq |w| \leq \frac{\pi}{4}$

3. ✖ LPF

4. ✖ BSF passing $\frac{\pi}{8} \leq |w| \leq \frac{\pi}{4}$

Question Number : 9 Question Id : 170527509 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The unilateral z-transform is restricted only to the analysis of

Options :

1. ✖ Non-causal systems with non- causal inputs

2. ✖ Non-causal systems with causal inputs

3. ✔ Causal systems with causal inputs

4. ✖ Causal systems with non-causal inputs

Question Number : 10 Question Id : 170527510 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Match the following:

(a)	Linear	(i)	$y(n) = \sum_{k=-\infty}^{\infty} x(k)$
(b)	Non- linear	(ii)	$y(n) = x^2(n)$
(c)	Causal	(iii)	$y(n) = x(-n)$
(d)	Non-causal	(iv)	$y(n) = x(n^2)$

Options :

1. ✔ a – iv, b- ii , c- i, d-iii

2. ✖ a – ii, b-i, c-iii, d-iv

3. ✖ a – iv, b- i , c-ii, d-iii

4. ✖ a – i, b- ii , c- iii, d-iv

Question Number : 11 Question Id : 170527511 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which one of the following statement is false?

Options :

1. ✖ Conductors are formed using metallic bonding and has positive temperature coefficient

2. ✔ Semiconductors are formed due to metallic bonding and has low resistance

3. ✖ Semiconductors are formed due to covalent bonding and has negative temperature coefficient

4. ✖ Insulators are formed due to ionic bonding and has negative temperature coefficient

Question Number : 12 Question Id : 170527512 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The motion of charge carrier from region of higher concentration to lower concentration leads to a current called

Options :

1. ✖ Drift current

2. ✔ Diffusion current

3. ✖ Pinch off current

4. ✖ Cut off current

Question Number : 13 Question Id : 170527513 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The hole concentration in p-type GaAs is given by $P = 10^{16}\left(1 - \dfrac{x}{L}\right) cm^{-3}$ for

$0 \leq x \leq L$ where $L = 10 \ \mu m$. If hole diffusion coefficient is $10 \ cm^2/s$ then hole diffusion current density at $x = 5 \ \mu m$ is

Options :

1. ✗ $20 \ A/cm^2$

2. ✔ $16 \ A/cm^2$

3. ✗ $24 \ A/cm^2$

4. ✗ $30 \ A/cm^2$

Question Number : 14 Question Id : 170527514 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The Avalanche breakdown occurs in lightly doped diodes where the depletion layer is
_____ and electric field is _____

Options :

1. ✗ Very low, very low

2. ✗ Very low, very high

3. ✔ Very wide, very low

4. ✗ Very wide, very high

Question Number : 15 Question Id : 170527515 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Laser diode has a threshold level of current, above which the laser action occurs and below which the laser diode behaves like a

Options :

1. ✗ PN junction diode

2. ✗ Highly doped Zener diode

3. ✔ LED emitting incoherent light

4. ✗ LCD emitting coherent light

Question Number : 16 Question Id : 170527516 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

In n-channel enhancement MOSFET, at a fixed drain voltage, the drain current is

Options :

1. ✗ maximum at zero gate voltage and it decreases with applied negative gate voltage

2. ✗ a finite value at zero gate voltage and it increases or decreases with the applied voltage of proper polarity

3. ✓ zero at zero gate voltage and it increases with the positive applied gate voltage

4. ✗ zero for negative bias voltage to gate and it increases as the negative gate bias is decreased in magnitude

Question Number : 17 Question Id : 170527517 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A Ge (Germanium) diode has a saturation current of 10 µA at 27°C. Find the saturation current at 127°C?

Options :

1. ✗ 10 µA

2. ✗ 20 µA

3. ✗ 1.27 mA

4. ✓ 10.24 mA

Question Number : 18 Question Id : 170527518 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The ratio of current of injected carriers into the base to the total emitter current is called

Options :

1. ✓ Emitter efficiency

2. ✖ Large signal current gain

3. ✖ DC current gain

4. ✖ Base transport factor

Question Number : 19 Question Id : 170527519 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The dc load line on the output characteristics of a transistor gives the following information except

Options :

1. ✖ Cutoff point

2. ✖ Saturation point

3. ✖ Active region

4. ✔ Thermal runaway

Question Number : 20 Question Id : 170527520 Question Type : MCQ Option Shuffling : Yes
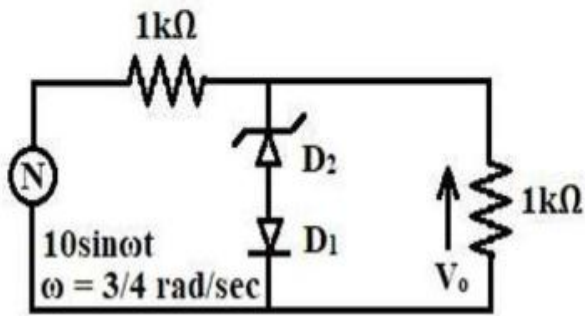**Correct Marks : 1 Wrong Marks : 0**

In which of the following region the FET behaves like a resistor?

Options :

1. ✖ Pinch off

2. ✖ Saturation

3. ✖ Breakdown

4. ✔ Ohmic

Question Number : 21 Question Id : 170527521 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The cut in voltage of both Zener diode D_2 & pn diode D_1 shown in figure is 0.7 V, while breakdown voltage of the Zener is 3.3 V and reverse breakdown of D_1 is 50 V. The other parameters can be assumed to be the same as those of an ideal diode. The value of the peak output voltage (V_o) is

Options :

1. ✖ 3.3V in the positive half cycle

2. ✔ 4V in the positive half cycle

3. ✖ 5V in the positive half cycle

4. ✖ 0.7V in the positive half cycle

Question Number : 22 Question Id : 170527522 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Consider the self-bias circuit where Vcc = 12 V, R_C = 5 kΩ, R_E = 1 kΩ, R_2 = 10 KΩ, R_1 = 90 kΩ and h_{fe} = 99. Find its stability factor
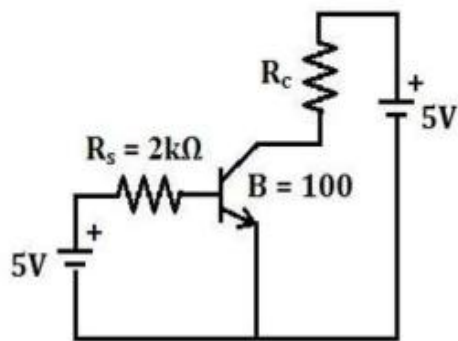
Options :

1. ✔ 9.17

2. ✖ 10.01

3. ✖ 16.32

4. ✖ 100

Question Number : 23 Question Id : 170527523 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The transistor in the given circuit should always be in the active region. Take $V_{CE(sat)} = 0.2V$, $V_{BE} = 0.7V$. The range of R_C in Ω, which can be used is

Options :

1. ✔ $22 < R_C < 23$

2. ✘ $28 < R_C < 29$

3. ✘ $30 < R_C < 32$

4. ✘ $19 < R_C < 21$

Question Number : 24 Question Id : 170527524 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
When identical amplifier stages are cascaded, then the overall value of

Options :

1. ✘ lower cut off frequency is lower than of an individual stage

2. ✔ lower cut off frequency is higher than of an individual stage

3. ✘ higher cut off frequency is higher than of an individual stage

4. ✘ bandwidth is higher than of an individual stage

Question Number : 25 Question Id : 170527525 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
The restorer is a
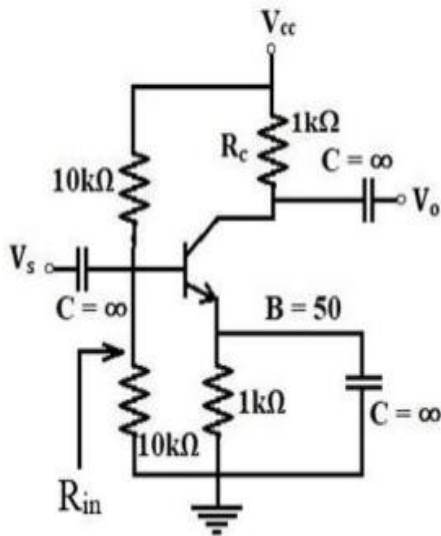
Options :

1. ✘ Clipper

2. ✔ Clamper

3. ✗ Summer

4. ✗ Rectifier

Question Number : 26 Question Id : 170527526 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The transconductance g_m of the transistor shown in figure is 10m℧. The value of input resistance R_{in} is

Options :
1. ✗ 10 kΩ

2. ✗ 8.3 kΩ

3. ✗ 5 kΩ

4. ✔ 2.5 kΩ

Question Number : 27 Question Id : 170527527 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The value of feedback resistance for an op-amp with a gain of −10 and input resistance equal to 10 kΩ is

Options :
1. ✗ 1 kΩ

2. ✗ 10 kΩ

3. ✖ 90 kΩ

4. ✔ 100 kΩ

Question Number : 28 Question Id : 170527528 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
The circuit shown below is an example of a
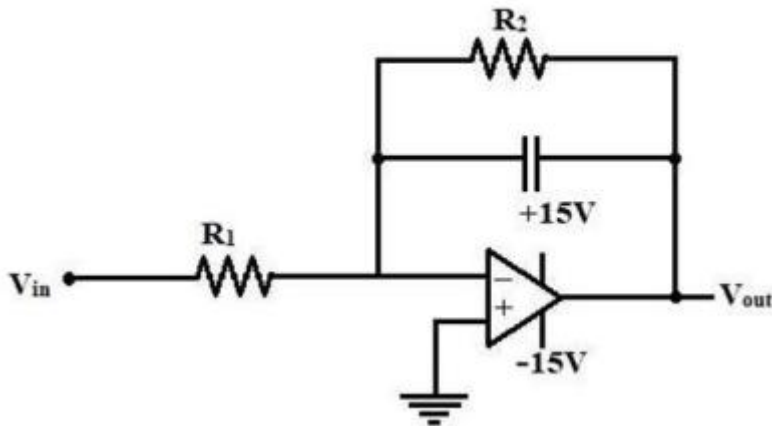
Options :

1. ✔ Low pass filter

2. ✖ Band pass filter

3. ✖ High pass filter

4. ✖ Notch filter

Question Number : 29 Question Id : 170527529 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
The equation for frequency of oscillations of Wein Bridge oscillator using op-amp is

Options :

1. ✖ $\dfrac{1}{\sqrt{2}\pi RC}$

2. ✔ $\dfrac{1}{2\pi RC}$

3. ✖ $\dfrac{1}{2\pi RC\sqrt{6}}$

4. ✻ $2\pi RC$

Question Number : 30 Question Id : 170527530 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A wide-band pass active filter having a gain of 4, f_l = 20 Hz and f_h = 2 KHz. Find the value of Q of the filter?

Options :

1. ✔ 0.1010

2. ✻ 0.0101

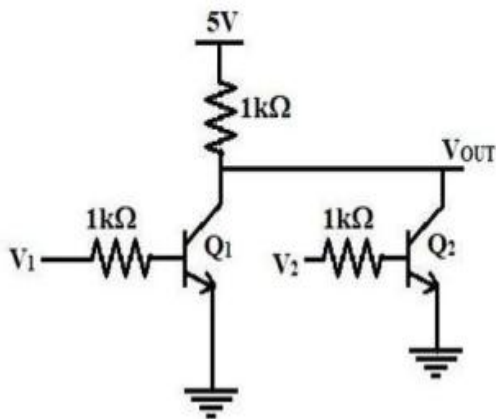3. ✻ 0.0001

4. ✻ 10000

Question Number : 31 Question Id : 170527531 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following logical gate is implemented using the circuit shown below where V_1 and V_2 are inputs (with 0 V as digital 0 and 5 V as digital 1) and V_{OUT} is the output?

Options :

1. ✻ NOT

2. ✔ NOR

3. ✻ NAND

4. ✻ XOR

Question Number : 32 Question Id : 170527532 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Convert the given expression in standard POS form

$$Y = A \cdot (A + B + C)$$

Options :

1. ✖ $(A + B \cdot \bar{B} + C\bar{C})(A + B + C)$

2. ✖ $(A + B + C)(A + \bar{B} + C)(A + B + \bar{C})$

3. ✖ $(A + B + C)(\bar{A} + \bar{B} + C)(\bar{A} + B + \bar{C})(A + \bar{B} + \bar{C})$

4. ✔ $(A + B + C)(A + \bar{B} + C)(A + B + \bar{C})(A + \bar{B} + \bar{C})$

Question Number : 33 Question Id : 170527533 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Which of the following is used to reduce the number of data lines required for transmission of occurrences of events?

Options :

1. ✔ Encoder

2. ✖ Decoder

3. ✖ Adder

4. ✖ Seven segment decoder

Question Number : 34 Question Id : 170527534 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

How can a decoder be converted into a demultiplexer?

Options :

1. ✔ With enable input

2. ✖ By adding one inverter

3. ✖ By adding subtractor

4. ✖ With Ex-OR gate

Question Number : 35 Question Id : 170527535 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

For a J-K flipflop, its J input is tied to its own $\overline{Q}$ output and the K input is connected to its own Q output. If the flipflop is fed with a clock of frequency 1 MHz, its Q output frequency will be

Options :

1. ✖ 1 MHz

2. ✖ 5 MHz

3. ✔ 0.5 MHz

4. ✖ 10 MHz

Question Number : 36 Question Id : 170527536 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

How can a D flip-flop be converted into a T flip-flop?

Options :

1. ✖ $D = T\overline{Q}$

2. ✖ $D = TQ$

3. ✖ $D = T \oplus \overline{Q}$

4. ✔ $D = T \oplus Q$

Question Number : 37 Question Id : 170527537 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

An n-bit binary counter consist of _____ flip-flops, and can count in binary from 0 to _____

Options :

1. ✔ n, $2^n - 1$

2. ✖ $n - 1$, $2^n - 1$

3. ✗ n, 2^n

4. ✗ $n-1$, 2^n

Question Number : 38 Question Id : 170527538 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

For a dual slope ADC type $3\frac{1}{2}$ digit DVM, the reference voltage is 100 mV and the first integration time is set to 300 ms. For some input voltage, the "disintegration" period is 370.2 ms. The DVM will indicate _____

Options :

1. ✔ 123.4 mV

2. ✗ 199.9 mV

3. ✗ 100.0 mV

4. ✗ 1.414 V

Question Number : 39 Question Id : 170527539 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Latch is a sequential circuit that takes all its inputs _____ and changes its output accordingly at any time _____ of a clock signal

Options :

1. ✗ Samples, independent

2. ✗ Samples, dependent

3. ✔ Continuously, independent

4. ✗ Continuously, dependent

Question Number : 40 Question Id : 170527540 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The DRAM stores binary information in

Options :

1. ✗ internal latches

2. ✔ the form of electric charges on capacitors

3. ✘ programmable OR array

4. ✘ programmable AND array

Question Number : 41 Question Id : 170527541 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
Find the result of the following program?
MOV R0, A
XOR A, #3Fh
XOR A, R0

Options :
1. ✘ A = 3Fh XOR N

2. ✔ 3Fh = A XOR N

3. ✘ N= A XOR 3Fh

4. ✘ A = 3Fh XOR A XOR R0

Question Number : 42 Question Id : 170527542 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
Match the following with respect to the characteristics of actual signals which severely strain a control system and their models

| (a)	sudden shock	(i)	ramp function
(b)	sudden change	(ii)	parabolic function
(c)	linear change with time	(iii)	impulse function
(d)	faster changes with time	(iv)	step function

Options :
1. ✘ a − i, b − ii, c − iv, d − iii

2. ✘ a − iv, b − i, c − iii, d − ii

3. ✔ a − iii, b − iv, c − i, d − ii

4. ✖ a – ii, b – i, c – iv, d – iii

Question Number : 43 Question Id : 170527543 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The Nyquist plot of G(s)H(s), which has one right hand pole is given below. The corresponding closed loop system is
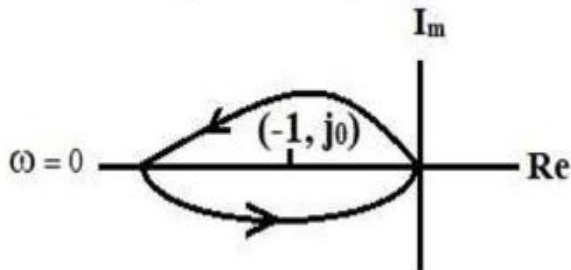
Options :

1. ✔ stable

2. ✖ unstable with one righthand pole

3. ✖ unstable with two righthand poles

4. ✖ unstable with three righthand poles

Question Number : 44 Question Id : 170527544 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

For a closed-loop system with loop transfer function L(s) is of _____ type, the system is _____ if the L(s) plot that corresponds to the Nyquist path does not enclose the (-1, j0) point.
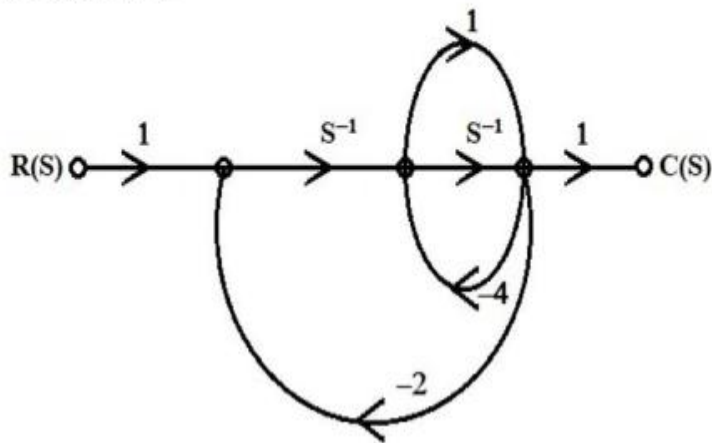
Options :

1. ✖ Maximum-phase, unstable

2. ✖ Minimum-phase, unstable

3. ✔ Minimum-phase, stable

4. ✖ Maximum-phase, stable

Question Number : 45 Question Id : 170527545 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The signal flow graph of a system is shown in figure. The transfer function $\dfrac{C(s)}{R(s)}$ of the system is

Options :

1. ✖ $\dfrac{6}{S^2 + 29S + 6}$

2. ✖ $\dfrac{6S}{S^2 + 29S + 6}$

3. ✖ $\dfrac{S(S+2)}{S^2 + 29S + 6}$

4. ✔ $\dfrac{(S+1)}{5S^2 + 6S + 2}$

Question Number : 46 Question Id : 170527546 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Consider a characteristic equation given by $S^4 + 3S^3 + 5S^2 + 6S + k + 10 = 0$. The condition for stability is

Options :

1. ✖ $k > 5$

2. ✖ $-10 < k$

3. ✖ $k > -4$

4. ✔ $-10 < k < -4$

Question Number : 47 Question Id : 170527547 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Given the autocorrelation function for a stationary process is $R_{XX}(\tau) = 25 + \dfrac{4}{1+6\tau}$.

Find the variance of the process X(t)

Options :

1. ✔ 4

2. ✖ 14.28

3. ✖ 25

4. ✖ 29

Question Number : 48 Question Id : 170527548 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The power spectrum $S_{XX}(w)$ for the random process that has the autocorrelation
function of $R_{XX}(\tau) = (A^2/2)\cos(w_0\tau)$ is

Options :

1. ✖ $2\pi\delta(w - w_0)$

2. ✖ $2\pi\delta(w + w_0)$

3. ✖ $\dfrac{A^2\pi}{2}[\delta(w - w_0) - \delta(w + w_0]$

4. ✔ $\dfrac{A^2\pi}{2}[\delta(w - w_0) + \delta(w + w_0]$

Question Number : 49 Question Id : 170527549 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The Power density of white noise is
(η is a real positive constant)

Options :

1. ✖ η

2. ✖ 2η

3. ✔ $\dfrac{\eta}{2}$

4. ✖ η^2

Question Number : 50 Question Id : 170527550 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

If S has 3 symbols with probabilities $\dfrac{1}{4}$, $\dfrac{1}{2}$ and $\dfrac{1}{4}$ then the binary entropy of S is

Options :

1. ✖ $\dfrac{1}{4}$

2. ✖ $\dfrac{1}{2}$

3. ✔ $\dfrac{3}{2}$

4. ✖ 1

Question Number : 51 Question Id : 170527551 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The modulation index of an Amplitude Modulated wave is changed from 0 to 1. The transmitted power is

Options :

1. ✖ Increased by 75 percent

2. ✖ Decreased by 75 percent

3. ✔ Increased by 50 percent

4. ✖ Decreased by 50 percent

Question Number : 52 Question Id : 170527552 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

In the spectrum of frequency modulated wave

Options :

1. ✖ The total number of sidebands depends on the modulation index

2. ✖ The carrier frequency disappears when the modulation index is large

3. ✔ The amplitude of any sideband depends on the modulation index

4. ✖ The carrier frequency cannot disappear with the modulation index

Question Number : 53 Question Id : 170527553 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which one is correct with respect to a simple AGC in a radio receiver?

Options :

1. ✔ An increase in signal strength produces more AGC

2. ✖ The highest AGC voltage is produced

3. ✖ The faster the AGC time constant the more accurate the output

4. ✖ The audio stage gain is normally controlled by the AGC

Question Number : 54 Question Id : 170527554 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A superheterodyne receiver with an IF of 450 kHz is tuned to a signal at 1200 kHz.
The image frequency is

Options :

1. ✖ 900 kHz

2. ✖ 1650 kHz

3. ✔ 2100 kHz

4. ✖ 2850 kHz

Question Number : 55 Question Id : 170527555 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Good voice reproduction via PCM requires 128 quantization levels. Its bandwidth of voice channel is 4kHz, then data rate is

Options :

1. ✖ 256 kbps

2. ✖ 128 kbps

3. ✔ 56 kbps

4. ✖ 28 kbps

Question Number : 56 Question Id : 170527556 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

In which of the following modulation technique, two or more bits are made for transmitting at once on a single signal?

Options :

1. ✖ ASK

2. ✖ FSK

3. ✖ PSK

4. ✔ M-ary ASK

Question Number : 57 Question Id : 170527557 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Consider a linear DM system designed to accommodate analog message signals limited to bandwidth of 3.5 kHz. A sinusoidal test signals of amplitude $A_{max} = 1\,V$ and frequency $f_m = 800\,Hz$ is applied to the system. The sampling rate of the system is 64kHz. Minimum value of the step size to avoid overload is

Options :

1. ✖ 240 mV

2. ✖ 120 mV

3. ✖ 67.25 mV

4. ✔ 78.5 mV

Question Number : 58 Question Id : 170527558 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The bandwidth required for transmitting binary FSK signal is

Options :

1. ✔ $4\ f_b$

2. ✖ $2\ f_b$

3. ✖ f_b

4. ✖ $f_b\big/2$

Question Number : 59 Question Id : 170527559 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The cladding which surrounds the fiber core

Options :

1. ✖ Is used to protect the fiber

2. ✖ Is used to reduce optical interference

3. ✔ Acts to help guide the light in the core

4. ✖ Ensures that the refractive index remains constant

Question Number : 60 Question Id : 170527560 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

As electromagnetic waves travel in free space, only one of the following can happen to them.

Options :

1. ✖ Absorption

2. ✖ Refraction

3. ✖ Reflection

4. ✔ Attenuation

Question Number : 61 Question Id : 170527561 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

In free space $\bar{E}(z,t) = 50\cos(\omega t - \beta z)\bar{a}_x$ (V/m), then average power crossing a circular
area of radius 2.5 m in the plane z = constant is

Options :
1. ✔ 65.1 W

2. ✖ 32.5 W

3. ✖ 130.2 W

4. ✖ 64.2 W

Question Number : 62 Question Id : 170527562 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Consider a transmission line of characteristic impedance 50Ω. Let it be terminated at
one end by +j50 ohm. The VSWR produced by it in the transmission line will be

Options :
1. ✖ +1

2. ✖ 0

3. ✔ ∞

4. ✖ +j

Question Number : 63 Question Id : 170527563 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The standard reference antenna for the directive gain is

Options :
1. ✖ Infinitesimal dipole

2. ✖ Elementary doublet

3. ✖ Half-wave dipole

4. ✔ Isotropic antenna

Question Number : 64 Question Id : 170527564 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following one is not correct with respect to Faraday's law?

Options :

1. ✖ When a changing flux is linked with the circuit, an emf is induced in the circuit

2. ✖ Whenever a conductor cuts across the magnetic lines of force, an emf is induced in it

3. ✖ The value of the emf produced is directly proportional to the rate of change of flux linked with the conductor

4. ✔ The emf induced in a conductor is inversely proportional to the rate of change of flux linked with the conductor

Question Number : 65 Question Id : 170527565 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Match the following:

(a)	Primary cell	(i)	fluid in paste form
(b)	Daniel cell	(ii)	one fluid cell
(c)	Dry cell	(iii)	chemical action
(d)	Voltaic cell	(iv)	two fluid cell

Options :

1. ✖ a − i, b − ii, c − iii, d − iv

2. ✖ a − ii, b − iii, c − iv, d − i

3. ✔ a − iii, b − iv, c − i, d − ii

4. ✖ a − iv, b − i, c − ii, d − iii

Question Number : 66 Question Id : 170527566 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following motor produces constant speed throughout the process?

Options :
1. ✖ Universal motor

2. ✖ DC series motor

3. ✖ Stepper motor

4. ✔ Synchronous motor

Question Number : 67 Question Id : 170527567 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A quantum dot is an example of

Options :
1. ✖ 1 – D Nano structure

2. ✖ 2 – D Nano structure

3. ✔ 3 – D Nano structure

4. ✖ Zero – Dimensional Nano structure

Question Number : 68 Question Id : 170527568 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

What is the unit of permeability in magnetic materials?

Options :
1. ✖ Ampere-turns/m

2. ✖ Ampere-turns/weber

3. ✖ Weber/m

4. ✔ Henry/m

Question Number : 69 Question Id : 170527569 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Identify the wrong answer with the properties of ceramics.

Options :

1. ✖ High hardness

2. ✔ High mass density

3. ✖ Low tensile strength

4. ✖ Good thermal insulator

Question Number : 70 Question Id : 170527570 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A hydroelectric power plant generates

Options :

1. ✔ Electrical energy from the moving water currents

2. ✖ Chemical energy from the stagnant water currents

3. ✖ Electrical energy from the stored temperature of water

4. ✖ Solar energy from the water reflection currents

Question Number : 71 Question Id : 170527571 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

An industrial consumer has a daily load pattern of 2000 kW, 0.8 lag for 12 hours and 1000 kW unity power factor for 12 hours. The load factor is

Options :

1. ✖ 0.5

2. ✖ 0.6

3. ✔ 0.75

4. ✖ 2.0

Question Number : 72 Question Id : 170527572 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Which of the following powerplants results into comparatively less carbon foot print?

Options :

1. ✔ Hydroelectric plant

2. ✘ Diesel power plant

3. ✘ Steam power plant

4. ✘ Gas Turbine plant

Question Number : 73 Question Id : 170527573 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Two 100 µA full scale PMMC meters are employed to construct a 10 V and a 100 V
full scale voltmeter. These meters will have figure of merit is

Options :

1. ✔ 10 kΩ/V and 10 kΩ/V

2. ✘ 100 kΩ/V and 10 kΩ/V

3. ✘ 10 kΩ/V and 100 kΩ/V

4. ✘ 10 kΩ/V and 1 kΩ/V

Question Number : 74 Question Id : 170527574 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A Wheatstone bridge requires a change of 7 Ω in the unknown arm of the bridge to
produce a change in deflection of 3 mm of the galvanometer. Determine the sensitivity.

Options :

1. ✔ 0.429 mm/Ω

2. ✘ 1.15 Ω/mm

3. ✘ 2.67 Ω/mm

4. ✘ 21 mm.Ω

Question Number : 75 Question Id : 170527575 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

A 10 kΩ variable resistance has a linearity of 0.1% and the movement of contact is 320°. If the instrument is to be used as a potentiometer with a linear scale of 0 to 1.6 V. Determine the maximum voltage error.

Options :

1. ✖ 0.1 mV

2. ✔ 1.6 mV

3. ✖ 1.0 V

4. ✖ 3.2 V

Question Number : 76 Question Id : 170527576 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

Power consumed by a balanced 3-phase, 3-wire load is measured by the two wattmeter method. The first wattmeter reads twice that of the second. Then the load impedance angle in radians is

Options :

1. ✖ $\pi/2$

2. ✖ $\pi/8$

3. ✔ $\pi/6$

4. ✖ $\pi/3$

Question Number : 77 Question Id : 170527577 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The simultaneous application of signals x(t) and y(t) to the horizontal and vertical plates, respectively of an oscilloscope, produces a vertical figure of 8 display. If P and Q are equal and $x(t) = P\sin(4t)$ then y(t) is equal to

Options :

1. ✖ $Q\sin(4t)$

2. ✔ Qsin(2t)

3. ✘ Qsin(8t)

4. ✘ Qsin(6t)

Question Number : 78 Question Id : 170527578 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The instrument used to measure relative amplitudes of single frequency components in a complex waveform is

Options :

1. ✔ Wave analyzer

2. ✘ CRO

3. ✘ Ratio meter

4. ✘ Instrumentation amplifier

Question Number : 79 Question Id : 170527579 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Match the following:

(a)	Pitot tube	(i)	velocity to pressure
(b)	Hydrometer	(ii)	Temperature to electric current
(c)	Thermocouple	(iii)	pressure to displacement
(d)	Bourdon tube	(iv)	specific gravity to displacement

Options :

1. ✔ a – i, b – iv, c – ii, d – iii

2. ✘ a – iv, b – i, c – iii, d – ii

3. ✘ a – ii, b – iii, c – iv, d – i

4. ✘ a – iii, b – ii, c – i, d – iv

Question Number : 80 Question Id : 170527580 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

The Hot wire anemometers are used to measure

Options :

1. ✖ Temperature

2. ✖ Humidity

3. ✔ Fluid flow

4. ✖ Weight

Section B

Section Id :	17052712
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	20
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	17052712
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 170527581 Question Type : MCQ Option Shuffling : Yes

Correct Marks : 1 Wrong Marks : 0

$$\sqrt{(22+37-15)\div 11 \times 13 - 3} =$$

Options :

1. ✔ 7

2. ✖ 11

3. ✖ 13

4. ✖ 3

Question Number : 82 Question Id : 170527582 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The salaries of three persons A, B and C are in the ratio $2:4:5$. If the salaries of A, B and C are increased by 30%, 25% and 20% respectively, then the ratio of their new salaries in the same order is

Options :

1. ✖ $3:5:5$

2. ✖ $12:20:25$

3. ✔ $13:25:30$

4. ✖ $15:25:28$

Question Number : 83 Question Id : 170527583 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

In a certain code language 'CODING is coded as 'DRIPWR then in the same language which word would be coded as 'YWUSQO'

Options :

1. ✖ DHLPTX

2. ✖ XTPMJE

3. ✖ YUQLHD

4. ✔ XTPLHD

Question Number : 84 Question Id : 170527584 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

A person celebrated his birthday on 12th December 1959. If it was on a Saturday, when will he celebrate his next birthday again on Saturday?

Options :

1. ✖ 12th December 1963

2. ✔ 12th December 1964

3. ✖ 12th December 1965

4. ✖ 12th December 1966

Question Number : 85 Question Id : 170527585 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Tsunamis are not caused by?

Options :

1. ✔ Hurricanes

2. ✖ Earthquakes

3. ✖ Undersea landslides

4. ✖ Volcanic eruptions

Question Number : 86 Question Id : 170527586 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The present chairman of the chiefs of staff committee in the Indian Armed Forces is

Options :

1. ✖ Bipin Rawat

2. ✖ Manoj Mukund Naravane

3. ✔ Anil Chauhan

4. ✖ Birender Singh Dhanaa

Question Number : 87 Question Id : 170527587 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The three new states of India that were created in 2000 are from

Options :

1. ✖ Uttar Pradesh, Bihar and West Bengal

2. ✖ Madhya Pradesh, Haryana and Rajasthan

3. ✖ West Bengal, Uttar Pradesh and Maharashtra

4. ✔ Madhya Pradesh, Uttar Pradesh and Bihar

Question Number : 88 Question Id : 170527588 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The river that flows towards the west is

Options :

1. ✖ Cauvery

2. ✔ Narmada

3. ✖ Krishna

4. ✖ Godavari

Question Number : 89 Question Id : 170527589 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Fill in the blank with suitable form of the verb:
    John's answers _____ his attitude.

Options :

1. ✖ are reflected

2. ✖ reflects

3. ✖ Have been reflected

4. ✔ reflect

Question Number : 90 Question Id : 170527590 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The Antonym of "Notorious " is ---------.

Options :

1. ✖ Uninterested

2. ✔ Famous

3. ✖ Vigorous

4. ✖ Tarnished

Question Number : 91 Question Id : 170527591 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Choose the one which can be substituted for the given words/sentence.
"One who does not care for literature or art"

Options :
1. ✔ Philistine

2. ✖ Dictator

3. ✖ Primitive

4. ✖ Hypocrite

Question Number : 92 Question Id : 170527592 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Choose an appropriate *preposition* from the options:
What you say has hardly any bearing _____ the lives of tribes.

Options :
1. ✖ about

2. ✖ for

3. ✔ on

4. ✖ in

Question Number : 93 Question Id : 170527593 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The sculptor who carved the Gunpark statue built as a symbol of the martyrs (369) of
the 1969 Special Telangana Movement is

Options :
1. ✖ B.S.Ramulu

2. ✖ VVR Chari

3. ✖ Durgam Ravinder

4. ✔ Ekka Yadagi Rao

Question Number : 94 Question Id : 170527594 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Who is the renowned Telangana artist known for his pioneering work in the Cheriyal
Scroll painting style?

Options :

1. ✖ Surya Prakash

2. ✔ Thota Vaikuntam

3. ✖ Laxma Goud

4. ✖ P. S. Ramakrishna

Question Number : 95 Question Id : 170527595 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

The traditional art form of Telangana, which involves storytelling through puppetry, is
called:

Options :

1. ✖ Burrakatha

2. ✔ Tholu Bommalata

3. ✖ Yakshagana

4. ✖ Kathakali

Question Number : 96 Question Id : 170527596 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0

Author and poet Mercy Margaret won the 2017 Sahitya Akademi Yuva Puraskar for
the book

Options :

1. ✖ Maatala Mantalu

2. ✔ Maatala Madugu

3. ✖ Maatalu Muchatlu

4. ✖ Maata Muchata

Question Number : 97 Question Id : 170527597 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
Which is the correct formatting of a 'SUM' formula?

Options :
1. ✖ =SUMOF(B1,B6)

2. ✖ SUM (B1 to B6)

3. ✔ =SUM(B1:B6)

4. ✖ SUMof(B1-B6)

Question Number : 98 Question Id : 170527598 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
Which of the following is not a web browser?

Options :
1. ✖ Internet Explorer

2. ✖ Firefox

3. ✖ Google Chrome

4. ✔ Ubuntu

Question Number : 99 Question Id : 170527599 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
In MS Word, macros are used for

Options :
1. ✔ Repeating a sequence of keystrokes with a given key combination

2. ✖ Automate the design of a document with a given key combination

3. ✖ Aggregating table rows or columns with given key combination

4. ✖ Editing Images using built-in VB code

Question Number : 100 Question Id : 170527600 Question Type : MCQ Option Shuffling : Yes
Correct Marks : 1 Wrong Marks : 0
How is a logo that appears in the same position on all the slides is added in Power Point?
Options :
1. ✖ Insert logo on handout master

2. ✔ Insert logo on the slide master

3. ✖ Insert logo on notes master

4. ✖ There is no direct way. It must be inserted manually on each slide