FINAL ANSWER KEY

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Question1:-What makes up the total current in a semiconductor ?

    A:-Drift and diffusion current

    B:-Diffusion current

    C:-Drift current

    D:-Drift, diffusion and biasing currents

    Correct Answer:- Option-A

Question2:-What makes changes in a load current in a zener voltage regulator ?

    A:-Zener current

    B:-Zener voltage

    C:-Zener voltage and current

    D:-None of the above

    Correct Answer:- Option-A

Question3:-Reason for drift current

    A:-Applied electric field

    B:-Motion of holes

    C:-Motion of electrons

    D:-Recombination of electrons and holes

    Correct Answer:- Option-A

Question4:-What is the diffusion capacitance in a diode with an applied voltage of 2 volts and charge in minority carriers outside the depletion region is 1.3×10^{-8} ?

    A:-6.5 nF

    B:-6.5 µF

    C:-6.5 pF

    D:-6.5 F

    Correct Answer:- Option-A

Question5:-An applied voltage of 10 volt and a resistance 1K-ohm is used with an approximate equivalent model of a silicon diode. Find the value of diode current at operating point.

    A:-10.7 mA

B:-0 mA

C:-9.3 mA

D:-8.5 mA

Correct Answer:- Option-C

Question6:-What is the output voltage in a positive clipper if the input voltage is higher than reference voltage ?

A:-Output voltage = Input voltage

B:-Output voltage = Reference voltage

C:-Output voltage = DC positive voltage

D:-All of the mentioned

Correct Answer:- Option-B

Question7:-What is the minimum input voltage required to switch the transistor into saturation when
$V_{CC}=12V, R_B$=15 KΩ, $R_C=6.8$ KΩ, *hfe* value = 25 and $V_{CE}=0.2V$?
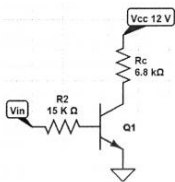
A:-1.74 V

B:-2.5 V

C:-3.7 V

D:-1.2 V

Correct Answer:- Option-A

Question8:-What is the device constant of an enhancement type in channel MOSFET with the drain current $I_D=5mA, V_{GS}=9V, and V_T=2V$?

A:-0.139 mA/V^2

B:-0.387 mA/V^2

C:-0.278 mA/V^2

D:-0.102 mA/V^2

Correct Answer:- Option-D

Question9:-What is the bandwidth of an Op Amp band pass filter, if the lower and higher cut off frequencies are 3.5 KHz and 15 KHz respectively ?

A:-1150 Hz

B:-11500 Hz

C:-115 Hz

D:-None of the above

Correct Answer:- Option-B

Question10:-Reason for the slope of the output characteristics of a CB configuration to be lower than that of a CE configuration is

    A:-Avalanche effect

    B:-Zener effect

    C:-Early effect

    D:-Hall effect

    Correct Answer:- Option-C

Question11:-What is the slew rate of IC 741 Op Amp with a bias current $I_Q = 22\mu A$ and internal frequency compensation capacitor $C_1 = 30pF$?

    A:-1.26

    B:-0.73

    C:-0.6

    D:-1.58

    Correct Answer:- Option-B

Question12:-In the case of an ideal operational amplifier, which of the following is

    A:-Input resistance = ∞ , output resistance = 0, bandwidth = ∞

    B:-Input resistance = ∞ , output resistance = ∞ , bandwidth = ∞

    C:-Input resistance = 0, output resistance = 0, bandwidth = 0

    D:-Input resistance = 0, output resistance = ∞, bandwidth = ∞

    Correct Answer:- Option-A

Question13:-What is a Schmitt trigger ?

    A:-Comparator with negative feedback

    B:-Comparator with positive feedback

    C:-Pulse generator positive feedback

    D:-Wave generator negative feedback

    Correct Answer:- Option-B

Question14:-Consider the following statements :
A. MOSFET is a voltage controlled oscillator.
B. BJT is slower than MOSFET.
C. BJT has higher bandwidth than MOSFET.
D. MOSFET has lesser thermal stability than BJT.

    A:-All are true

    B:-A, B and C are correct

    C:-A, B and D are correct

    D:-A and B are correct

    Correct Answer:- Option-B

Question15:-What is the condition to create depletion channel in an n channel enhancement MOSFET ?

A:- $V_{GS} > V_T$

B:-$V_{GS} < V_T$

C:-$V_{GS} > 2 V_T$

D:-$2V_{GS} < V_T$

Correct Answer:- Option-A

Question16:-The effect of the channel length modulation in a MOSFET operating in saturation region causes

A:-Decrease in transconductance

B:-Decrease in input impedance

C:-Decrease in output impedance

D:-Decrease in GATE source capacitance

Correct Answer:- Option-C

Question17:-What is the unity gain bandwidth of an n-channel MOSFET with following parameters with a bias of $V_{GS}=5V$?

$K_n = 0.25$ mA/V^2
$V_{TN} = 1$V
$\lambda = 0$
$C_{gd}=0.05pF$
$C_{gs}=0.3pF$

A:-929 MHz

B:-926 MHz

C:-919 MHz

D:-909 MHz

Correct Answer:- Option-D

Question18:-Find the cutoff frequency f_c for an operational amplifier having specific signal bandwidth of 2MHz and closed loop gain $A_{CL} = 250$ V/mV.

A:-16 Hz

B:-4 Hz

C:-8 Hz

D:-1 Hz

Correct Answer:- Option-B

Question19:-What is the maximum closed loop voltage gain, when the input signal varies by 0.1 volt in 10 microseconds with a slew rate SR = 3 V/ μS ?
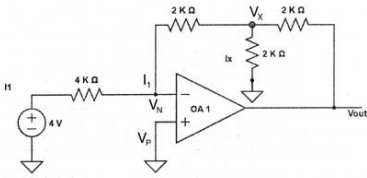
A:-100

B:-150

C:-300

D:-500

Correct Answer:- Option-C

Question20:-What is the value of current $-I_x$ in the following figure

A:-2 mA

B:-0.1 mA

C:-1 mA

D:-0.33 mA

Correct Answer:- Option-C

Question21:-An operational non inverting amplifier circuit in which all of the output voltage is fed back to the inverting input is called

A:-Differentiator

B:-Logarithmic amplifier

C:-Voltage follower

D:-Integrator

Correct Answer:- Option-C

Question22:-Identify the true statement if a BJT transistor is operating in saturation mode.

A:-CB and BE junction are forward biased

B:-CB and BE junctions are reverse biased

C:-CB junction forward biased and BE junction reverse biased

D:-CB junction reverse biased and BE junction forward biased

Correct Answer:- Option-A

Question23:-Which of the following are true regarding clamper ?
A. A positive clamper adds a positive DC voltage
B. Clamper can also be called as a re-inserter
C. To reduce tilt, reduce the RC value
D. Negative clamper will clamp the positive peak of output to the reference voltage

A:-All are true

B:-A and B

C:-A, B and D

D:-C only

Correct Answer:- Option-C

Question24:-In a 2 input summing amplifier with ideal Op Amp, $R_1 = 1$ KΩ, $R_2 = 5$ KΩ, and $R_F = 2$KΩ and $V_1 = 2$V, $V_2 = 3$V, $V_{CC} = +/- 10$V.

A:--5 V

B:--5.2 V

C:--4.2 V

D:--4.8 V

Correct Answer:- Option-B

Question25:-For a MOSFET in saturation the effective channel length decreases with increase in
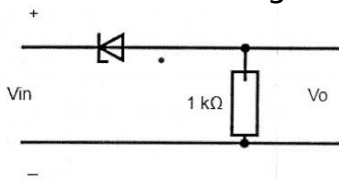
A:-Drain voltage

B:-Gate voltage

C:-Source voltage

D:-Body voltage

Correct Answer:- Option-A

Question26:-What is we output voltage v_o when the input is 7 volt and zener breakdown voltage of the zener diode is 10 V.

A:-5 V

B:-10 V

C:-0 V

D:-7 V

Correct Answer:- Option-C

Question27:-What is the AC ripple at the output of a half a rectifier with an AC supply of 50 Hz ?

A:-25 Hz

B:-50 Hz

C:-100 Hz

D:-15 Hz

Correct Answer:- Option-B

Question28:-At room temperature the band gap of germanium is

A:-3.4 eV

B:-0.9 eV

C:-0.7 eV

D:-1.1 eV

Correct Answer:- Option-C

Question29:-What happens when the forward current to an LED is increased ?

A:-Intensity of LED increases

B:-Intensity of LED decreases

C:-Intensity of LED increases up to a certain maximum value and after that starts decreasing

D:-Intensity remains constant

Correct Answer:- Option-C

Question30:-Which of the following are characteristics of an LED ?
A. Fast response time
B. Hi warm up time
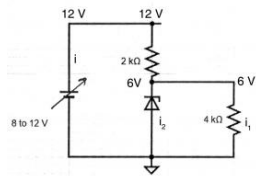C. Long life
D. Law energy consumption.

A:-A, B and D

B:-All the above

C:-C and D

D:-A, C and D

Correct Answer:- Option-D

Question31:-In the given circuit the battery voltage is varied between 8 to 12 volts and the zener breakdown voltage is 6 volts. What will be the maximum current through the zener diode ?

A:-1.5 mA

B:-5 mA

C:-2.5 mA

D:-6.5 mA

Correct Answer:- Option-A

Question32:-Calculate the number of columns per second if the area is 5 cm^2 recombination rate of holes is 1000 cm^3 /S and differential length is 2 mm.

A:-1.6×10^{-23}

B:-1.6×10^{-22}

C:-1.6×10^{-20}

D:-1.6×10^{-18}

Correct Answer:- Option-B

Question33:-What is the maximum potential a material can process if it has zero permittivity ?

A:-0

B:-Infinity

C:-Unity

D:-None of the above

Correct Answer:- Option-A

Question34:-What type of semiconductor a solar cell belongs to ?

A:-PN junction

B:-P type semiconductor

C:-N type semiconductor

D:-Extrinsic semiconductor

Correct Answer:- Option-A

Question35:-What is the reverse current in a photo diode when there is no incident light ?

A:-Saturation current

B:-Zener current

C:-Dark current

D:-Leakage current

Correct Answer:- Option-C

Question36:-The fractional number 0.3125 in decimal number system can be represented in binary number system as

A:-$(0.0101)_2$

B:-$(0.1010)_2$

C:-$(0.0100)_2$

D:-$(0.1011)_2$

Correct Answer:- Option-A

Question37:-Representation of decimal number 498 in hexadecimal number system is

A:-$(2F1)_{16}$

B:-$(1F2)_{16}$

C:-$(312)_{16}$

D:-$(213)_{16}$

Correct Answer:- Option-B

Question38:-Let a binary function F(A, B, C, D) = Σ (0, 2, 5, 7, 8, 10, 13, 15). This binary function when reduced using a 4 variable K-Map will result in

A:-AB + A′B′

B:-BC + B′C′

C:-ABC

D:-BD + B′D′

Correct Answer:- Option-D

Question39:-Assume 3 inverters, each with propagation delay of 100 ns are connected in series and the output of the third inverter is connected to the first inverter. Assume there is no other external input. The output of the third inverter will have an approximate fundamental frequency of

A:-10 MHz

B:-5 MHz

C:-3.34 MHz

D:-1.67 MHz

Correct Answer:- Option-D

Question40:-A JK flip-flop with J = 1, K = 1 has a clock signal with frequency of 10 KHz. The Q output is

A:-Always 1

B:-Always 0

C:-5 KHz square wave

D:-10 KHz square wave

Correct Answer:- Option-C

Question41:-A 4 bit asynchronous binary counter with negative edge triggered D flip-flops with propagation delay of 10 ns. What is the highest frequency allowed for the counter to operate reliably, avoiding timing issues caused by propagation delay ?

A:-40 MHz

B:-80 MHz

C:-25 MHz

D:-50 MHz

Correct Answer:- Option-C

Question42:-A 12 bit Analog to Digital Converter (ADC) is used with a voltage range 0 to 5 volt. What is the possible value for voltage resolution ?

A:-2.44 milli volts

B:-0.416 micro volts

C:-1.22 milli volts

D:-2.4 micro volts

Correct Answer:- Option-C

Question43:-Maximum possible signal to Noise Ratio of an 8 bit ADC considering the effect of quantisation noise is

A:-49.8 dB

B:-256 dB

C:-128 dB

D:-64 dB

Correct Answer:- Option-A

Question44:-The conversion time of n bit flash type ADC with clock period T is

A:-nT

B:-(n–1)T

C:-2^n T

D:-T

Correct Answer:- Option-D

Question45:-Example for a volatile memory is

A:-RAM

B:-ROM

C:-PROM

D:-EPROM

Correct Answer:- Option-A

Question46:-Periodic refreshing is needed for

A:-RAM

B:-ROM

C:-DRAM

D:-EPROM

Correct Answer:- Option-C

Question47:-An SRAM with address lines A0 to A15 and data lines D0 to D7 has a total capacity of

A:-64 MB

B:-64 KB

C:-32 KB

D:-16 MB

Correct Answer:- Option-B

Question48:-Von Neumann architecture is an example for

A:-SIMD

B:-MIMD

C:-SISD

D:-MISD

Correct Answer:- Option-C

Question49:-DSP processors generally follow

A:-Von Neumann architecture

B:-Harvard architecture

C:-FIR architecture

D:-IIR architecture

Correct Answer:- Option-B

Question50:-Regarding pipelined processing, select the wrong statement.

A:-Program fetch, program decode and execute are different stages of pipelining

B:-Execute stage of fixed-point instructions take more phases than that of a floating-point instruction

C:-Execute stage of Branch instruction may need six execute phases

D:-Execute stage of floating-point instructions take more phases than that of a fixed-point instruction

Correct Answer:- Option-B

Question51:-To access data from an address location stored in a register R and then to increment the register contents by a displacement d, we may use

A:-*R

B:-*+R(d)

C:-*R++(d)

D:-*++R(d)

Correct Answer:- Option-C

Question52:-A shift register in which output Q of the last flipflop is connected to the input of the first flipflop is called

A:-Parallel counter

B:-Ripple counter

C:-Ring counter

D:-BCD counter

Correct Answer:- Option-C

Question53:-A 4-bit R/2R digital-to-analog (DAC) converter uses resistance values of 1K and 2K in the ladder network. Number of 1K resistances and 2K resistances needed for the ladder network is _____ and _____ respectively.

A:-5, 3

B:-3, 3

C:-4, 4

D:-3, 5

Correct Answer:- Option-D

Question54:-Finding the sample values in between the pulses with different amplitudes produced by a DAC is called

A:-Decimation

B:-Interpolation

C:-Sampling

D:-Reconstruction

Correct Answer:- Option-B

Question55:-A multiplexer has 2 select lines S1 and S0 and 4 input lines A0, A1, A2, A3. Assume S1 and S0 are shorted and connected to a clock signal. Multiplexer will have an output Y switching between

A:-A2 and A1

B:-A0 and A3

C:-A1 and A3

D:-A2 and A3

Correct Answer:- Option-B

Question56:-For a super-heterodyne receiver, which of the following is true ?

A:-Converts RF to IF then demodulates

B:-RF is converted to IF through demodulation

C:-RF and IF are combined to get demodulated signal

D:-RF is amplified to get IF

Correct Answer:- Option-A

Question57:-Consider 2x(t)cos $(\omega_C t)$ is a DSB received signal, with x(t) as the modulating signal having power P_M . What is the output power if the received signal is coherent demodulated and lowpass filtered ?

A:-$2P_M$

B:-$4P_M - 1$

C:-$2(P_M - 1)$

D:-P_M

Correct Answer:- Option-D

Question58:-A single Side Band (SSB) signal produced by a modulating signal A cos $(\omega_m t)$, with a carrier cos $(\omega_C t)$ is

A:- $$A \cos(\omega_m t) \left[\cos(\omega_C t) + j\sin(\omega_C t) \right]$$

B:- $$A \sin(\omega_m t) \left[\cos(\omega_C t) + j\sin(\omega_C t) \right]$$

C:- $$A \left[\cos(\omega_m t) \cos(\omega_C t) \right]$$

D:- $$A \left[\cos(\omega_m t) \cos(\omega_C t) - \sin(\omega_m t) \sin(\omega_C t) \right]$$

Correct Answer:- Option-D

Question59:-A signal, band limited to ω_m , is used to amplitude modulate a carrier. What is the carrier frequency if the bandwidth of the AM modulated signal is 2% of the carrier frequency ?

A:-$200\omega_m$

B:-$50\omega_m$

C:-$100\omega_m$

D:-$75\omega_m$

Correct Answer:- Option-C

Question60:-If the modulating signal has frequency 10 KHz, the phase modulated signal with a carrier of
1 MHz can be

A:-$A\sin(2\pi10^3t)B\cos(2\pi t)$

B:-$B\cos\left(2\pi10^6t+A\sin(2\pi10^3t)\right)$

C:-$B\cos(2\pi10^9t)+A\sin(2\pi t)$

D:-$B\cos\left(\pi10^6t+A(2\pi10^3t)\right)$

Correct Answer:- Option-B

Question61:-Given two band-limited signals x_1 (t) and x_2 (t) with band limits 3 KHz and 5 KHz respectively. What is the Nyquist rate for sampling the convolution of the signals, x_1 (t)*x_2 (t) ?

A:-10 KHz

B:-30 KHz

C:-16 KHz

D:-6 KHz

Correct Answer:- Option-D

Question62:-What is the minimum sampling frequency for a band pass signal with upper limit 10 KHz and lower limit 6 KHz, as per the band pass sampling theorem ?

A:-12 KHz

B:-10 KHz

C:-20 KHz

D:-8 KHz

Correct Answer:- Option-B

Question63:-For a full scale sinusoid with peak magnitude 5 volts, what is the signal to quantization noise power, with a quantization signal step-size 2, in PCM ?

A:-37.5

B:-12.5

C:-75

D:-25

Correct Answer:- Option-A

Question64:-For a lossless channel, the channel matrix has

A:-All elements 1s

B:-Only one non-zero element in each row

C:-Only one non-zero element in each column

D:-Diagonal elements zero

Correct Answer:- Option-C

Question65:-A source generates three symbols with probabilities 0.6, 0.2 and 0.2 at a rate of 4000 symbols per second. If the source is generating these symbols

independently, what is the average bit rate of a most efficient source encoder ?

A:-4200 bps

B:-4000 bps

C:-6200 bps

D:-5600 bps

Correct Answer:- Option-D

Question66:-What is the average information rate for a Discrete Memoryless Source (DMS) that emits four symbols $\{x_1, x_2, x_3 \text{ and } x_4\}$ with code-length 1, 2, 3 and 3 respectively, with probabilities $P(x_1)=0.6, P(x_2)=0.2, P(x_3)=0.1 \text{ and } P(x_4)=0.1$?

A:-2 bit/sym

B:-1.6 bit/sym

C:-1.9 bit/sym

D:-2.1 bit/sym

Correct Answer:- Option-B

Question67:-Given a parity matrix, $P = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$ for a (6, 3) hamming code. What is the systematic linear-block code generated for the message [0 1 1] ?

A:-[0 1 1 1 1 1]

B:-[1 1 1 1 1 0]

C:-[0 1 1 1 1 0]

D:-[1 1 0 1 1 0]

Correct Answer:- Option-C

Question68:-If a 16-QAM Gray-coded constellation, with signal set {±1, ±3}, maps data [0 0 0 0] to symbol {−3 + j3}; then, the symbol for [1 1 0 0] can be

A:-{−3 + j}

B:-{−1 + j3}

C:-{3 + j3}

D:-{1 + j3}

Correct Answer:- Option-D

Question69:-The bit rate of a digital communication system is R kbits/s. The modulation used is 64-QAM. The minimum bandwidth required for ISI free transmission is

A:-R/64 Hz

B:-R/6 KHz

C:-R/8 KHz

D:-R/4 KHz

Correct Answer:- Option-B

Question70:-Which one of the following statements about Differential Pulse Code

Modulation (DPCM) is True ?

A:-No predictor output, but the message signal alone is quantized

B:-Two back-to-back message signal are compared and the difference is quantized

C:-The difference of message signal with its prediction is quantized

D:-Predictor output is one-bit quantized and transmitted

Correct Answer:- Option-C

Question71:-Given, sampling frequency 30 KHz and Bandwidth 3 KHz. Which step size will minimize slope-overload error for Delta Modulation system with a normalized sinusoid as input ?

A:-$\Delta \geq 0.2_\pi$

B:-$\Delta \geq 9_\pi$

C:-$\Delta \geq 30_\pi$

D:-$\Delta \geq 0.5_\pi$

Correct Answer:- Option-A

Question72:-In the following pairs of OSI protocol layer/sub-layer and its functionality, the INCORRECT pair is

A:-Physical layer and demodulation

B:-Transport layer and end-to-end process communication

C:-Application layer and multi-access

D:-Network layer and routing

Correct Answer:- Option-C

Question73:-In a token-ring network, the transmission bit rate is 10 Mbps at a propagation speed on cable 200 m/μS. Here, 2-bit delay is equivalent to

A:-500 m of the cable

B:-40 m of the cable

C:-20 m of the cable

D:-100 m of the cable

Correct Answer:- Option-B

Question74:-A binary PSK system has a bit rate of 1 Mbps. If the received waveforms, $\pm 10^{-2}\cos(\omega_0 t)$, are coherently detected by a matched filter, what is the probability of error, given that the channel's one sided noise power spectral density is 10^{-11} W/Hz ?

A:-$Q_{(\sqrt{5})}$

B:-$Q_{(\sqrt{20})}$

C:-$Q_{(\sqrt{5.16})}$

D:-$Q_{(\sqrt{10})}$

Correct Answer:- Option-D

Question75:-If the internal capacitor of an op-amp is 20 pF and the maximum current to charge the capacitor is 10 µA, what is the slew-rate ?
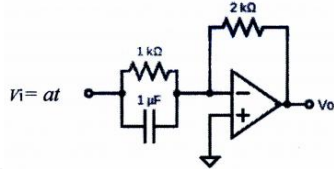
    A:-0.5 V/µS

    B:-5 V/µS

    C:-200 V/µS

    D:-50 V/µS

    Correct Answer:- Option-A

Question76:-
What is the value of the output voltage, Vo, with input 'at' where a is a constant and t is time ?

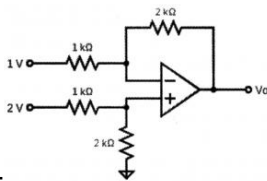   A:-$(10^{-3}+2at)$

    B:-$-a(10^{-3}+2at)$

    C:-$-2a(10^{-3}+t)$

    D:-$(a10^{-3}+2t)$

    Correct Answer:- Option-C

Question77:-
The value of Vo ?

    A:-7 V

    B:-2 V

    C:-6 V

    D:-3.2 V

    Correct Answer:- Option-B

Question78:-The limitation of a 3-terminal monolithic voltage regulator is

    A:-Output impedance is low

    B:-Input impedance is high

    C:-Output current is not constant

    D:-Output voltage is fixed

    Correct Answer:- Option-D

Question79:-Which of the following is a frequency response of a first order active low-pass filter, with R_f and R_1 deciding the gain while R and C deciding the band of functioning ?

    A:-$\dfrac{1}{(R_f/R_1+j\omega RC)}$

B:- $\dfrac{1}{(1+j\omega RCR_f/R_1)}$

C:- $\dfrac{(1+R_f/R_1)}{(1+j\omega RC)}$

D:- $\dfrac{(1+j\omega RC)}{(1+R_f/R_1)}$

Correct Answer:- Option-C

Question80:-The Q-factor of a bandpass filter with f_U and f_L as the upper and lower cut off frequency, respectively, is
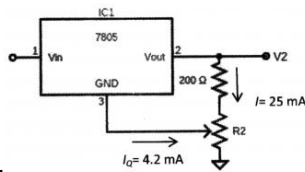
A:- $\dfrac{f_U f_L}{(f_U-f_L)^2}$

B:- $\dfrac{\sqrt{f_U f_L}}{(f_U-f_L)}$

C:- $\dfrac{(f_U+f_L)}{(f_U-f_L)}$

D:- $\left|\dfrac{f_U f_L}{(f_U^2-f_L^2)}\right|$

Correct Answer:- Option-B

Question81:-
What is the value of R_2 to obtain output voltage, $V_2 = 7.5$ V ? (The IC 7805 gives 5V regulated output with a quiescent current, $I_Q = 4.2$ mA and a designed value of 25 mA through 200 Ω resistor).

A:-≈ 85 Ω

B:-≈ 120 Ω

C:-≈ 50 Ω

D:-≈ 1 kΩ

Correct Answer:- Option-A

Question82:-The advantage of using a dual slope ADC in a digital voltmeter is

A:-Low pass consumption

B:-BCD format output

C:-Accuracy is high

D:-Conversion time is very small

Correct Answer:- Option-C

Question83:-The number of comparators in 4-bit flash ADC is

A:-15

B:-16

C:-8

D:-5

Correct Answer:- Option-A

Question84:-The resolution of a 4-bit counting ADC is 0.5 Volts. For an analog input of 7.3 Volts, the digital output of the ADC will be

A:-1011

B:-1111

C:-1100

D:-1101

Correct Answer:- Option-B

Question85:-A fixed-duty cycle DC-DC boost converter with a 100 W rating draws 10A from the input DC supply when powering a 100W, 25V DC load. What is the required input DC supply rating for proper operation when the converter is used to power a 30V DC load that draws 2A ?

A:-12V, 3A

B:-25V, 5A

C:-12V, 5A

D:-25V, 4A

Correct Answer:- Option-C

Question86:-A single-phase to single-phase cycloconverter is used to control a 240V, 60Hz single-phase induction motor with V/f control. The cycloconverter has an input AC of 300V. If the motor is running at half of its rated speed with a power factor of 0.75, what is the AC input power factor of the cycloconverter ?

A:-0.75

B:-0.50

C:-0.30

D:-0.25

Correct Answer:- Option-C

Question87:-Which statement accurately describes a MOSFET ?

A:-MOSFET is an ON controlled device

B:-MOSFET is an OFF controlled device

C:-MOSFET is an ON and OFF controlled device

D:-MOSFET is an uncontrolled device

Correct Answer:- Option-C

Question88:-A step-down chopper is used for speed control of a DC motor. If the turn-on time of the MOSFET is decreased by 20% un-altering the switching frequency, what will be the new average output voltage compared to the previous average output voltage ?

A:-0.2 times

B:-0.8 times

C:-1.2 times

D:-1.8 times

Correct Answer:- Option-B

Question89:-A 120 degree voltage source inverter is used for speed control of an induction motor. Which of the following is more true about this control ?

A:-V/f control is possible with this control

B:-V/f control is possible if a step-down chopper is added at its front end

C:-V/f control is possible if a rectifier is added at its front end

D:-Both 2 and 3

Correct Answer:- Option-B

Question90:-A boost converter is used to convert 50V DC to 150V DC. The PWM gate signal for this converter is fed from a microcontroller having 3.3V as its DC supply. What is the DC average value of this gate signal ?

A:-2.5 V

B:-2.2 V

C:-1.65 V

D:-9.9 V

Correct Answer:- Option-B

Question91:-Which of the following is not a common type of stepper motor drive ?

A:-Full-step drive

B:-Half-step drive

C:-Microstepping drive

D:-Dual-phase drive

Correct Answer:- Option-D

Question92:-A 12V Zener diode regulator has a power dissipation in Zener diode and series resistor as 6W and 16W respectively. If the load current is 1.5 A, what is the duty cycle of a SMPS based buck regulator which replaces this Zener regulator ?

A:-0.3

B:-0.6

C:-0.4

D:-0.2

Correct Answer:- Option-B

Question93:-What will be the peak value of a PWM controlled voltage source inverter fed from a dc supply of voltage, V ?

A:-V/2

B:-V/√2

C:-V

D:-2V

Correct Answer:- Option-C

Question94:-In a boost converter, if the output voltage is thrice the input voltage, what is the duty cycle of the switch ?

    A:-50%

    B:-33.3%

    C:-25%

    D:-66.6%

    Correct Answer:- Option-D

Question95:-A PWM signal has a frequency of 10 KHz and a duty cycle of 60%. What is the on-time of the signal ?

    A:-6 ms

    B:-60 µs

    C:-6 µs

    D:-60 ms

    Correct Answer:- Option-B

Question96:-What is the difference between a buck converter and a step down chopper ?

    A:-Both buck converter and step down chopper are same

    B:-Buck converter cannot be used with R load

    C:-Buck converter is a step down chopper with a low pass filter

    D:-Chopper cannot be used with RL load

    Correct Answer:- Option-C

Question97:-Which of the following is not a type of stepper motor ?

    A:-Permanent Magnet Stepper Motor

    B:-Hybrid Stepper Motor

    C:-Variable Reluctance Stepper Motor

    D:-Brushless DC Stepper Motor

    Correct Answer:- Option-D

Question98:-What is the frequency of the output voltage of a voltage source inverter (VSI) if the input voltage is 480 V, the modulation index is 0.8, and the carrier frequency is 6 KHz ?

    A:-2 KHz

    B:-4 KHz

    C:-6 KHz

    D:-18 KHz

    Correct Answer:- Option-C

Question99:-A DC separately excited motor is fed from a step down chopper such that motor runs at rated speed and torque producing a back emf of magnitude

having half of chopper supply voltage when duty cycle is 80%. Find the duty cycle for obtaining half rated speed at rated torque.

A:-40%

B:-45%

C:-50%

D:-55%

Correct Answer:- Option-D

Question100:-A signal b cos(at) is used amplitude modulated. The transmitted signal can be

A:- $b\cos(2\pi f_c t + \cos(at\phi))$

B:- $b\cos(at)\cos(2\pi f_c t + \phi)$

C:- $b\cos(at)\cos^2(2\pi f_c t + \phi)$

D:- $b\cos^2(2\pi f_c t + \cos(at))$

Correct Answer:- Option-B