Dedicated Freight Corridor Corporation of India Ltd.

A Government of India (Ministry of Railways) Enterprise

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Test Time	4:30 PM - 6:30 PM
Subject	EXECUTIVE SIGNAL & TELECOMMUNICATION

Section : **General Aptitude Knowledge**

Q.1 With the army of which country has Indian army conducted a two-week joint military exercise 'Yudh Abhyas 2018' in Uttarakhand in September 2018?

Question ID : **1860452231**
Status : **Answered**
Chosen Option : **1**

Ans
✔ 1. USA
✘ 2. France
✘ 3. Germany
✘ 4. UK

Q.2 The Indian Air Force has successfully carried out the first ever mid-air refuelling of which of the following combat aircrafts?

Question ID : **1860452233**
Status : **Answered**
Chosen Option : **1**

Ans
✔ 1. Tejas
✘ 2. Cheetah
✘ 3. Dhruv
✘ 4. Rudra

Q.3 Which one of the following is hailed as the finest specimen of Indo-British architecture in India, and called the 'Taj of the Raj'?

Question ID : **1860452228**
Status : **Answered**
Chosen Option : **1**

Ans
✔ 1. The Victoria Memorial Hall, Kolkata
✘ 2. Victoria Terminus, Bombay
✘ 3. Rashtrapati Bhavan, New Delhi
✘ 4. Cellular Jail, Andaman and Nicobar Islands

Q.4 A device used to test whether any object is carrying a charge or not is known as _____.

Question ID : **1860452237**
Status : **Answered**
Chosen Option : **3**

Ans
✘ 1. Stethoscope
✘ 2. Coulomb device
✘ 3. Electrostatic device
✔ 4. Electroscope

Q.5 Which airport will become the first airport of India to provide paperless air travel to the domestic passengers through biometric technology?

Question ID : **1860452234**
Status : **Answered**
Chosen Option : **1**

Ans
✘ 1. Chhatrapati Shivaji International Airport, Mumbai
✔ 2. Kempegowda International Airport, Bengaluru
✘ 3. Sardar Vallabhbhai Patel International Airport, Ahmedabad

✗ 4.
Indira Gandhi International Airport, New Delhi

Q.6 Government of which Union Territory has launched 'Home Delivery of Public Services' scheme as an attempt to eliminate corruption in various public dealing offices?

Question ID : **1860452232**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. Chandigarh
✗ 2. Puducherry
✗ 3. Lakshadweep
✓ 4. Delhi

Q.7 Where is the famous and India's largest Buddhist monastery, Tawang Monastery, located?

Question ID : **1860452229**
Status : **Answered**
Chosen Option : **4**

Ans
✓ 1. Arunachal Pradesh
✗ 2. Assam
✗ 3. Nagaland
✗ 4. Manipur

Q.8 Which among the following States has the largest number of Lok Sabha seats?

Question ID : **1860452230**
Status : **Answered**
Chosen Option : **4**

Ans
✓ 1. West Bengal
✗ 2. Gujarat
✗ 3. Assam
✗ 4. Rajasthan

Q.9 Which state is the largest producer of tomatoes in India?

Question ID : **1860452236**
Status : **Answered**
Chosen Option : **2**

Ans
✓ 1. Andhra Pradesh
✗ 2. Madhya Pradesh
✗ 3. West Bengal
✗ 4. Gujarat

Q.10 In which year was the Gandhi-Irwin Pact signed?

Question ID : **1860452227**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. 1942
✗ 2. 1935
✓ 3. 1931
✗ 4. 1921

Q.11 Which of the following is NOT an instrument of the monetary policy of the Reserve Bank of India?

Question ID : **1860452235**
Status : **Answered**
Chosen Option : **1**

Ans
✓ 1. Goods and Services Tax (GST)
✗ 2. Bank Rate
✗ 3. Statutory Liquidity Ratio (SLR)
✗ 4. Cash Reserve Ratio (CRR)

Q.12 Which of the following pass (es) through the Indian mainland?

1. The Tropic of Capricorn
2. The Tropic of Cancer
3. The Equator

Question ID : **1860452226**
Status : **Answered**
Chosen Option : **3**

Ans
✗ 1. Both 2 and 3
✗ 2. Only 1

✔ 3. Only 2

✘ 4. Both 1 and 2

Section : **Logical Reasoning**

Q.1 A, B, C, D, E and F are sitting in a theatre facing the stage. F is sitting second from the left end. D is on the immediate right of F. A is at an extreme end and has C as neighbour. E is between B and F. Who is sitting to the right of 'C'?

Question ID : **1860452240**
Status : **Answered**
Chosen Option : **4**

Ans

✘ 1. D

✘ 2. E

✘ 3. B

✔ 4. A

Q.2 Abhijit leaves his house and moves 30 km in northwest direction and 30 km in southwest direction. Next, he moves 30 km in southeast direction. Then he moves 30 km in northeast direction. How far away is he from his house?

Question ID : **1860452244**
Status : **Answered**
Chosen Option : **2**

Ans

✘ 1. 10 km

✔ 2. 0 km

✘ 3. 30 km

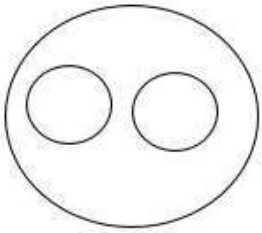
✘ 4. 20 km

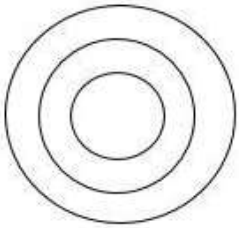
Q.3 Which of the Venn diagrams correctly represents the following classes as applicable in India?

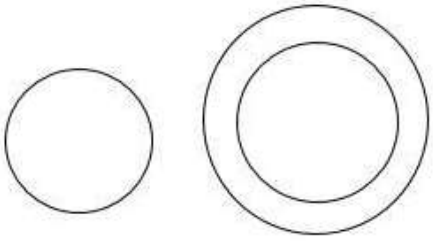
President, Cabinet, Home Minister

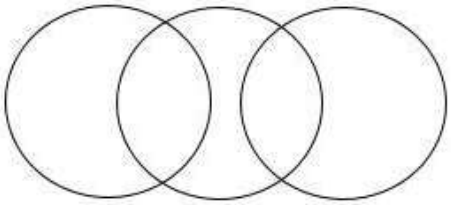
Question ID : **1860452249**
Status : **Answered**
Chosen Option : **3**

Ans

✘ 1. 

✘ 2. 

✔ 3. 

✘ 4. 

Q.4 From the given alternatives, select the word which CANNOT be formed using the letters of the given word: RESOLUTELY

Question ID : **1860452242**
Status : **Answered**
Chosen Option : **4**

Ans

✘ 1. LUSTRE

✘ 2. SELLOUT

✘ 3. TROLLEYS

✔ 4. RESULTS

Q.5 Find a number, which when added to itself 14 times, gives 120.

Question ID : **1860452247**

Ans
1. 9
2. 6
3. 7
4. 8

Status : **Answered**
Chosen Option : **4**

Q.6 Select the option which is different from the other three responses:

Question ID : **1860452238**
Status : **Answered**
Chosen Option : **3**

Ans
1. OQTX
2. CEHL
3. KMPT
4. NPSV

Q.7 Choose the correct alternative from the given ones that will complete the given number series:

62, 73, 95, 128, 172, _____?

Question ID : **1860452239**
Status : **Answered**
Chosen Option : **4**

Ans
1. 204
2. 248
3. 258
4. 227

Q.8 In the following equation, two numbers need to be interchanged to make it correct. Choose the numbers from the given alternatives:

$6 \times 3 + 8 \div 2 - 1 = 9 - 3 \div 4 + 5 \times 2$

Question ID : **1860452245**
Status : **Answered**
Chosen Option : **2**

Ans
1. 2, 8
2. 5, 9
3. 3, 6
4. 1, 9

Q.9 An argument always has:

Question ID : **1860452246**
Status : **Answered**
Chosen Option : **3**

Ans
1. Noise
2. Difficulty
3. Disagreement
4. Mediator

Q.10 J, K, L, M and N are five cousins. M is half the age of K; N is twice the age of J. K is half the age of J. M is half the age of L. Who is the youngest of all?

Question ID : **1860452248**
Status : **Answered**
Chosen Option : **2**

Ans
1. L
2. M
3. K
4. J

Q.11 Given below are two statements. Consider these statements to be true even if they seem factually absurd. Read the conclusions and then decide which of the given conclusions logically follow(s) from the given statements?

Statements:

1. All noodles are forks.
2. No fork is a spoon.

Conclusions:

I. No noodle is a spoon.
II. Some forks are noodles.

Question ID : **1860452241**
Status : **Answered**
Chosen Option : **4**

Ans
1. Neither conclusion follows.
2. Only conclusion I follows.
3. Only conclusion II follows.
4. Both the conclusions follow.

Q.12 If the twelfth day of a month is 4 days after Friday, what day will it be on the first day of the month?

Question ID : **1860452243**
Status : **Answered**
Chosen Option : **1**

Ans
✔ 1. Friday
✘ 2. Monday
✘ 3. Tuesday
✘ 4. Wednesday

Section : **Engineering Mathematics**

Q.1 The expression for the truth table given below in POS form is given by:

Question ID : **1860452254**
Status : **Answered**
Chosen Option : **4**

A	B	C	F
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	1
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	0

Ans
✘ 1. AB'C+ABC'
✔ 2. (A+B+C')(A'+B'+C')
✘ 3. A'B'C+ABC
✘ 4. (A+B'+C')(A'+B'+C')

Q.2 Two voltages given as –2 V and –1V in positive logic convention represent:

Question ID : **1860452253**
Status : **Answered**
Chosen Option : **1**

Ans
✘ 1. –2 V is logic 1 and –1 V is logic 0
✘ 2. –5 V is logic 0 in some circuits and 1 in the other
✔ 3. –2 V is logic 0 and –1 V is logic 1
✘ 4. –5 V is logic 1 in some circuits and 0 in the other

Q.3 The number of essential prime implicants for the function Y = A'B'C'D' + A'BCD' + AB'C'D + ABC'D' is given by _____.

Question ID : **1860452252**
Status : **Answered**
Chosen Option : **4**

Ans
✘ 1. 1
✘ 2. 2
✔ 3. 3
✘ 4. 4

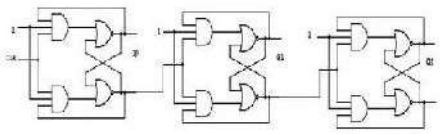
Q.4 A buffer is:

Question ID : **1860452255**
Status : **Answered**
Chosen Option : **4**

Ans
✘ 1. Neither inverting nor non-inverting
✔ 2. Inverting or non-inverting
✘ 3. Always non-inverting
✘ 4. Always inverting

Q.5 The current state of Q2Q1Q0 – 100 for the circuit below. The next state will be _____.

Question ID : **1860452251**
Status : **Not Answered**
Chosen Option : **--**



Ans
✔ 1. 101
✘ 2. 111

✗ 3. 001

✗ 4. 110

Q.6 The Boolean function AB+AC is equivalent to _____.

Question ID : **1860452250**
Status : **Not Answered**
Chosen Option : **--**

Ans

✗ 1. AB+AC+BC

✗ 2. A'B'C'+ABC'+A'BC

✗ 3. ABC+A'BC+B'C'

✓ 4. ABC+ABC'+AB'C

Section : **Networks Signals & systems**

Q.1 PLA consists of _____.

Question ID : **1860452259**
Status : **Not Answered**
Chosen Option : **--**

Ans

✗ 1. Programmable AND and fixed OR arrays

✓ 2. Programmable AND and Programmable OR arrays

✗ 3. Fixed AND and Programmable OR arrays

✗ 4. Fixed AND and Fixed OR arrays

Q.2 When two asynchronous active low inputs PRESET and CLEAR are applied to a J-K flip flop, the output will be _____.

Question ID : **1860452257**
Status : **Answered**
Chosen Option : **3**

Ans

✗ 1. 0

✓ 2. Undefined

✗ 3. Previous State

✗ 4. 1

Q.3 5:32 decoder circuit can be implemented with _____.

Question ID : **1860452264**
Status : **Answered**
Chosen Option : **3**

Ans

✓ 1. One 2:4 decoder and 43:8 decoders

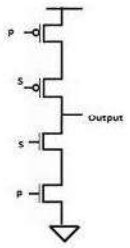
✗ 2. Four 3:8 decoders

✗ 3. Two 3:8 decoders

✗ 4. Eight 2:4 decoders

Q.4 Output of the circuit shown below when S = 1 and S = 0 will be _____.

Question ID : **1860452258**
Status : **Not Answered**
Chosen Option : **--**



Ans

✗ 1. P and High Impedance state respectively

✓ 2. High Impedance state and P' respectively

✗ 3. 0 and 1 respectively

✗ 4. X and P respectively

Q.5 A particular logic family has VOH = 5V, VOL = 1V, VIH = 3.5 and VIL = 2V. The Noise margins values NM_H and NM_L will be:

Question ID : **1860452260**
Status : **Not Answered**
Chosen Option : **--**

Ans

✓ 1. 1.5V, 1V

✗ 2. 5V, 1V

✗ 3. 1V, 1.5V

✗ 4. 4.1V, 5V

Q.6 The resolution of 4 Bit counting ADC is 0.5 V. For an analog input 5.8 volt, the output of ADC will be _____.

Question ID : **1860452266**
Status : **Not Answered**
Chosen Option : **--**

Ans
✓ 1. 1100
✗ 2. 1111
✗ 3. 1010
✗ 4. 1011

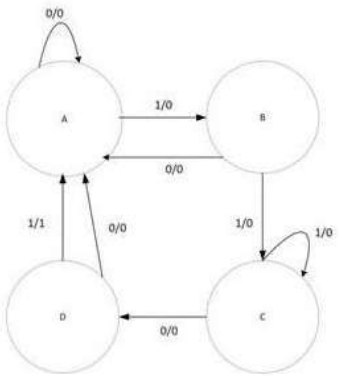
Q.7 A problem detector system produces an alarm in the factory when one of the three conditions occurs. The system is designed as such only one condition can occur at a time. If the three conditions are defined as q, r and s respectively, the output logic for the system can be given as .

Question ID : **1860452261**
Status : **Not Answered**
Chosen Option : **--**

Ans
✗ 1. q'rs+r's'
✓ 2. qr's'+qs
✗ 3. qrs'+r'
✗ 4. q+r+s

Q.8 The sequence detected by the state diagram shown below is _____.

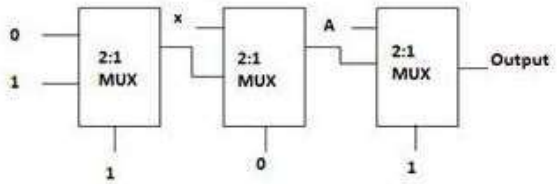
Question ID : **1860452267**
Status : **Marked For Review**
Chosen Option : **4**



Ans
✗ 1. 1110 sequence detector without overlap
✗ 2. 1110 sequence detector with overlap
✓ 3. 1101 sequence detector without overlap
✗ 4. 1101 sequence detector with overlap

Q.9 The output of the circuit shown in Fig. is _____.

Question ID : **1860452256**
Status : **Answered**
Chosen Option : **4**



Ans
✗ 1. 0
✓ 2. X
✗ 3. A
✗ 4. 1

Q.10 For a Typical CMOS process, the minimum feature size is set to be λ = 25 μm. The minimum line width of process is set to be _____.

Question ID : **1860452265**
Status : **Not Answered**
Chosen Option : **--**

Ans
✗ 1. 100 μm
✗ 2. 12.5 μm
✓ 3. 50 μm

✗ 4. 25 μm

Q.11 Race around condition is associated with _____.

Question ID : **1860452263**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. Combinational circuits
✓ 2. Sequential circuits with level triggered clock
✗ 3. Sequential circuits
✗ 4. Both Sequential and Combinational circuits

Q.12 Minimum number of half adders, full adders and AND gates required to implement 2 × 3 Multiplier is given as _____.

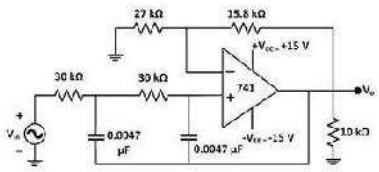
Question ID : **1860452262**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. 1, 2, 6
✗ 2. 1, 1, 6
✗ 3. 2, 2, 6
✓ 4. 2, 1, 6

Section : **Electronic devices**

Q.1 Find the high cut-off frequency of second order filter as shown in the figure below:

Question ID : **1860452273**
Status : **Not Answered**
Chosen Option : **--**



Ans
✓ 1. 1128 Hz
✗ 2. 1028 Hz
✗ 3. 1228 Hz
✗ 4. 1528 Hz

Q.2 The transistor in the circuit of below Fig. has $\beta = 100$ and exhibits a V_{BE} of 0.7 V at $I_C = 2$ mA. Find the values of R_C and R_E respectively, so that a current of 3 mA flows through the collector and a voltage of 15 V appears at the collector:

Question ID : **1860452270**
Status : **Not Answered**
Chosen Option : **--**

Ans
✗ 1. 4.59 k and 3.33 k
✗ 2. 3.33 k and 2 k
✗ 3. 4.59 k and 2 k
✓ 4. 3.33 k and 4.59 k

Q.3 The CMOS inverter can be used as an amplifier when:

Question ID : **1860452279**
Status : **Answered**
Chosen Option : **3**

Ans
✗ 1. PMOS is in linear, NMOS is in cut-off.
✗ 2. Both are in linear region.
✓ 3. both PMOS and NMOS are in saturation.
✗ 4. NMOS is in linear, PMOS is in cut-off.

Q.4 For given op-amp circuit, consider infinite input resistance and zero output resistance. If A = 100 (open loop gain) then what will be the closed loop gain?

Question ID : **1860452275**
Status : **Not Answered**
Chosen Option : **--**

Ans
✓ 1. 0.99
✗ 2. 0.25
✗ 3. 0.7

✗ 4. 0.11

Q.5 Diffusion capacitance of PN Junction Diode _____.

Question ID : **1860452278**
Status : **Answered**
Chosen Option : **2**

Ans
✗ 1. increases with increasing current and increasing temperature

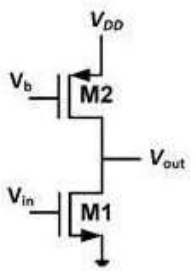
✓ 2. increases with increasing current and decreasing temperature

✗ 3. decreases with decreasing current and decreasing temperature

✗ 4. decreases with increasing current and increasing temperature

Q.6 What is the voltage gain for the circuit given below?

Question ID : **1860452272**
Status : **Not Answered**
Chosen Option : **--**



Ans
✗ 1. $-gm1\ (ro1 \times ro2)$

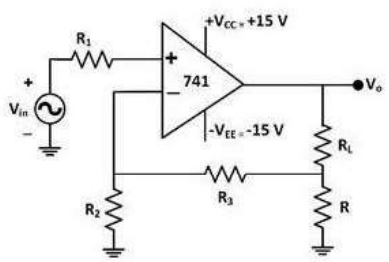
✓ 2. $-gm1\ (ro1 || ro2)$

✗ 3. $gm1\ (ro1 \times ro2)$

✗ 4. $gm1\ (ro1 || ro2)$

Q.7 In the given circuit, which type of feedback configuration is used?

Question ID : **1860452274**
Status : **Answered**
Chosen Option : **2**



Ans
✗ 1. Series – Shunt feedback

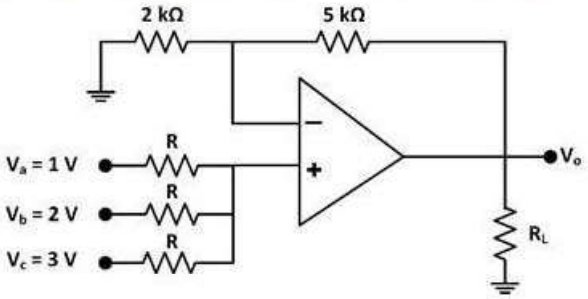
✗ 2. Shunt – Shunt feedback

✓ 3. Series – Series feedback

✗ 4. Shunt – Series feedback

Q.8 In the given circuit below, what will be the value of V_o?

Question ID : **1860452271**
Status : **Not Answered**
Chosen Option : **--**



Ans
✗ 1. 8 V

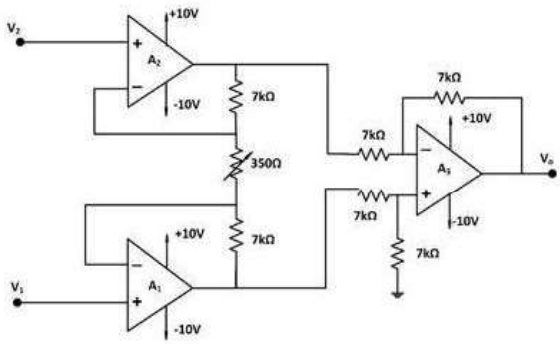
✔ 2. 7 V

✘ 3. –5 V

✘ 4. –4 V

Q.9 Calculate the expression of output voltage for the given circuit:

Question ID : **1860452276**
Status : **Not Answered**
Chosen Option : **--**



Ans

✔ 1. 41(V1 – V2)

✘ 2. 11(V2 - V1)

✘ 3. 11(V1 – V2)

✘ 4. 41(V2 - V1)

Q.10 A Darlington emitter follower circuit is sometimes used in the output stage of TTL gate to _____.

Question ID : **1860452268**
Status : **Answered**
Chosen Option : **1**

Ans

✘ 1. To decrease power consumption

✘ 2. Decrease its I_{OH}

✘ 3. Increase its I_{OL}

✔ 4. To increase speed

Q.11 What is the peak output voltage of a class B amplifier for a supply voltage of V_{CC} = 15 V with an efficiency of 69 %?

Question ID : **1860452277**
Status : **Answered**
Chosen Option : **2**

Ans

✘ 1. 17.31 V

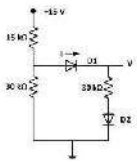
✘ 2. 21.74 V

✔ 3. 13.17 V

✘ 4. 10.35 V

Q.12 Assume that the diode D1 is ideal and D2 has cut in voltage of 0.3 as given in the circuit below. Find out the values of labeled voltage and current:

Question ID : **1860452269**
Status : **Not Answered**
Chosen Option : **--**



Ans

✘ 1. 8 V and 0.5 mA

✘ 2. 7.57 V and 0.5 mA

✘ 3. 8 V and 0.24 mA

✔ 4. 7.57 V and 0.24 mA

Section : **Analog Circuits**

Q.1 The output resistance of JFET when operating in pinch off at a current 10 mA and λ = 0.05 V^{-1} is given by:

Question ID : **1860452280**
Status : **Not Answered**
Chosen Option : **--**

Ans

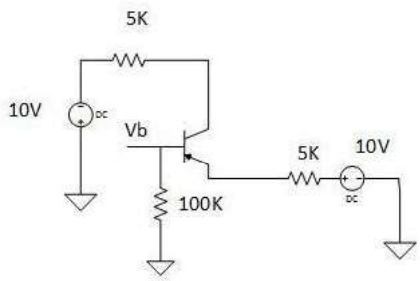
✘ 1. 450Ω

✔ 2. 2kΩ

✘ 3. 200Ω

✘ 4. 2Ω

Q.2 If VB = 1V and VE = 1.7 V, β and Vc of the circuit will be _____.



Question ID : **1860452288**
Status : **Not Answered**
Chosen Option : **--**

Ans
✔ 1. 165 and –1.75 V
✘ 2. 150 and –2.75 V
✘ 3. 0.994 and –1.75 V
✘ 4. 180 and 2.75 V

Q.3 An NMOS has Id = 5m A, Vgs = 2V, Vds = 4V and Vt = 0.8 V. If the thickness of oxide is 500 A°, the aspect ratio of device at room temperature will be .

Question ID : **1860452287**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✘ 1. 1.5
✘ 2. 14
✘ 3. 25
✔ 4. 35

Q.4 Fourier Transform of *sgn* (t) is _____, where *sgn* represents signum function.

Question ID : **1860452291**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✘ 1. jω
✘ 2. 2jω
✘ 3. jω/2
✔ 4. 2/jω

Q.5 An MOS Capacitor with P Substrate is in accumulation mode. The dominant charge in the channel is due to the presence of _____.

Question ID : **1860452286**
Status : **Answered**
Chosen Option : **2**

Ans
✘ 1. electrons
✘ 2. negatively charged ions
✔ 3. holes
✘ 4. positively charged ions

Q.6 Trans conductance of MOSFET in linear region can be approximated by _____.

Question ID : **1860452282**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✘ 1. 2K(VGS-VT)
✔ 2. KVDS
✘ 3. ID/(VGS-VDS)
✘ 4. $K(VGS-VT)^2/ID$

Q.7 A Si sample is doped with 10^{17} Arsenic atoms/cm^3. Displacement of EF relative to Ei is _____.

Question ID : **1860452284**
Status : **Not Answered**
Chosen Option : **--**

Ans
✘ 1. Positive, 0.589 eV
✘ 2. Negative, 0.589 eV
✔ 3. Positive, 0.407 eV
✘ 4. Negative, 0.407 eV

Q.8 An N-Channel JFET has I_{DSS} = 4 mA and Vp = –8V. Its maximum transconductance is _____.

Question ID : **1860452290**
Status : **Not Answered**

Ans
✘ 1. 4 S

2. 0.002 S
3. 0.2 S
4. 0.001 S

Chosen Option : --

Q.9 For a BJT, α = 0.97 and collector base junction reverse saturation is given by 0.4 μA. This BJT is connected in common emitter configuration and operating in active region. If I_B = 15 μA, the collector current for the device will be _____.

Question ID : **1860452281**
Status : **Not Answered**
Chosen Option : --

Ans
1. 506 μA
2. 498.34 μA
3. 1.01 mA
4. 1 mA

Q.10 Probability of energy state Ef (Fermi Level) occupied by an electron at absolute temperature can be approximated as _____.

Question ID : **1860452283**
Status : **Not Answered**
Chosen Option : --

Ans
1. 0.5
2. 0
3. 0.25
4. 1

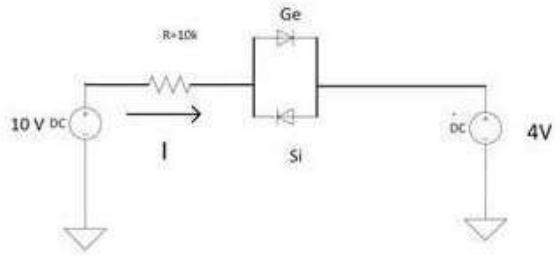
Q.11 At a constant collector current, the magnitude of base emitter voltage decreases by 2 mV for every XX rise in temperature. Here XX is _____.

Question ID : **1860452289**
Status : **Not Answered**
Chosen Option : --

Ans
1. 3 °C
2. 9 °C
3. 4 °C
4. 1 °C

Q.12 Value of current in this circuit is _____.

Question ID : **1860452285**
Status : **Not Answered**
Chosen Option : --

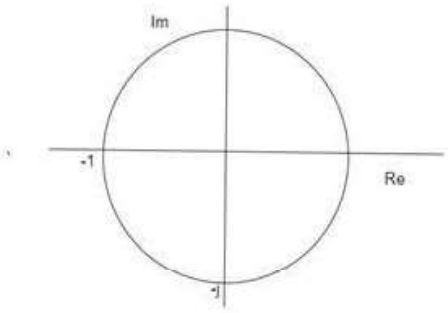


Ans
1. 1 mA
2. 1.7 mA
3. 0.57 mA
4. 0.53 mA

Section : **Digital circuits**

Q.1 The Nyquist plot given below represents which circuit?

Question ID : **1860452309**
Status : **Answered**
Chosen Option : **2**



Ans
1. High Pass Filter
2. Low Pass Filter

✔ 3. All Pass Filter

✘ 4. Notch Filter

Q.2 What is the total power carried by sidebands of the AM wave (DSB) for tone modulation for $\mu = 0.4$?

Question ID : **1860452293**
Status : **Answered**
Chosen Option : **2**

Ans

✔ 1. 7.4%

✘ 2. 11.11%

✘ 3. 4.3%

✘ 4. 8.3%

Q.3 Which of the following requires least bandwidth?

Question ID : **1860452297**
Status : **Answered**
Chosen Option : **4**

Ans

✘ 1. DSB-SC

✘ 2. DSB

✘ 3. VSB

✔ 4. SSB

Q.4 To increase the rate of communication by $\log_2 M$ in M-ary communication, the power requirement increases by _____.

Question ID : **1860452296**
Status : **Answered**
Chosen Option : **1**

Ans

✘ 1. 2^M

✔ 2. M^2

✘ 3. M^M

✘ 4. 2M

Q.5 An Amplitude modulated signal has a carrier frequency of 10 kHz. The upper sideband is transmitted at 11 kHz. The bandwidth required for the AM signal to transmit is _____.

Question ID : **1860452304**
Status : **Not Answered**
Chosen Option : **--**

Ans

✘ 1. 10 kHz

✔ 2. 2 kHz

✘ 3. 11 kHz

✘ 4. 1 kHz

Q.6 Which modulation technique does NOT use past information for modulation?

Question ID : **1860452295**
Status : **Answered**
Chosen Option : **4**

Ans

✘ 1. Delta Modulation

✔ 2. Pulse Code Modulation

✘ 3. Adaptive Differential Pulse Code Modulation

✘ 4. Adaptive Delta Modulation

Q.7 Number of bits per symbol in a 16 QAM is _____.

Question ID : **1860452301**
Status : **Answered**
Chosen Option : **1**

Ans

✔ 1. 4

✘ 2. 16

✘ 3. 8

✘ 4. 32

Q.8 If the constant 'k' is negative, then what would be its contribution to the phase plot?

Question ID : **1860452307**
Status : **Answered**
Chosen Option : **3**

Ans

✘ 1. 90 degrees

✘ 2. 45 degrees

✘ 3. 180 degrees

✔ 4. 0 degree

Q.9

Inverse Fourier Transform of $\delta(\omega-\omega_0)$ is _____.

Question ID : **1860452292**
Status : **Not Answered**
Chosen Option : **--**

Ans
✗ 1. $2\pi/ e^{j\omega 0t}$
✗ 2. $e^{j\omega 0t}$
✓ 3. $e^{j\omega 0t}/2\pi$
✗ 4. $2\pi\ e^{j\omega 0t}$

Q.10 An op-amp based programmable gain amplifier with a negative feedback is designed. Which method will be the best suitable for its stability analysis?

Question ID : **1860452306**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. Bode Plot
✗ 2. Nyquist Plot
✓ 3. Root Locus
✗ 4. R-H Stability Criteria

Q.11 A system with a unity gain margin and zero phase margin is _____.

Question ID : **1860452305**
Status : **Answered**
Chosen Option : **3**

Ans
✗ 1. sluggish
✗ 2. highly stable
✓ 3. oscillatory
✗ 4. relatively stable

Q.12 The signal power and noise power are denoted by S and N respectively. If the signal power increases to 3S and the noise power reduces by half, the ratio of old SNR to the new SNR is given by _____.

Question ID : **1860452300**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. 6
✗ 2. 2/3
✗ 3. 1.5
✓ 4. 1/6

Q.13 The maximum efficiency of AM modulation (tone modulation) is _____.

Question ID : **1860452298**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. 67%
✗ 2. 30%
✗ 3. 70%
✓ 4. 33%

Q.14 The modulation index of an AM modulated signal is 0.7 and the carrier power is 14 W. Calculate total sideband power.

Question ID : **1860452299**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. 18.47 W
✗ 2. 23.14 W
✗ 3. 12.39 W
✓ 4. 17.43 W

Q.15 Identify the correct definition for Phase Margin and Gain Margin:

Question ID : **1860452308**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1.
I. Gain margin is a factor by which the system gain can be increased to drive the system to the verge of instability.
II. Phase margin is the additional phase lead at gain cross over frequency to bring the system to verge of instability

✓ 2.
I. Gain margin is a factor by which the system gain can be increased to drive the system to the verge of instability.
II. Phase margin is the additional phase lag at gain cross over frequency to bring the system to verge of instability

✗ 3.
I. Gain margin is a factor by which the system gain can be decreased to drive the system to the verge of instability.
II. Phase margin is the additional phase lead at gain cross over frequency to bring the system to verge of instability.

✗ 4.
I. Gain margin is a factor by which the system gain can be decreased to drive the system to the verge of instability.
II. Phase margin is the additional phase lag at gain cross over frequency to bring the system to verge of instability.

Q.16

The bit rate of digital communication system is M kbps. The modulation used is 16-QAM. The minimum bandwidth required for ideal transmission is _____.

Question ID : **1860452303**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. M/2 kHz
✗ 2. M/16 kHz
✗ 3. M kHz
✓ 4. M/8 kHz

Q.17 A practical signal could be _____.

Question ID : **1860452294**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. both, time limited and band limited, simultaneously
✓ 2. both, time limited and band limited, but not at the same time
✗ 3. band limited
✗ 4. time limited

Q.18 Which of the following has the least noise immunity?

Question ID : **1860452302**
Status : **Answered**
Chosen Option : **2**

Ans
✗ 1. QAM
✓ 2. ASK
✗ 3. FSK
✗ 4. PSK

Section : **Control System**

Q.1 A discrete time system y(n) is the resultant convolution of f(n) and h(n) having length 3 and 5 respectively. The maximum possible sample value of f(n) and h(n) are 10 and 20 respectively. Find the maximum possible value for sum of all sample value of y(n).

Question ID : **1860452327**
Status : **Not Answered**
Chosen Option : **--**

Ans
✓ 1. 3000
✗ 2. 15
✗ 3. 130
✗ 4. 200

Q.2 Slow response of an over-damped system can be made faster with the help of _____ controller.

Question ID : **1860452314**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. PD
✓ 2. P
✗ 3. PI
✗ 4. Remote

Q.3 A system is given by $x(t) = e^{at} u(t)$. The system is _____.

Question ID : **1860452326**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. Causal and Stable
✗ 2. Non-Causal and Stable
✓ 3. Causal and Unstable
✗ 4. Non-Causal and Unstable

Q.4 A condition where integral control action drives the output of a controller into saturation is called _____.

Question ID : **1860452315**
Status : **Answered**
Chosen Option : **4**

Ans
✓ 1. Wind-Up
✗ 2. Noise
✗ 3. Repeat
✗ 4. Offset

Q.5

Question ID : **1860452310**

There are 2 systems:

a. An automatic washing machine
b. An automatic intensity adjustable light bulb

Which of these systems will be more sensitive to the variation in system's gain?

Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. Data is insufficient
✗ 2. Automatic intensity adjustable light bulb
✗ 3. Both will be equally sensitive
✓ 4. Automatic washing machine

Q.6 The fourier series expansion of $sgn(\cos(t))$ has _____. Where sgn represents the signum function.

Question ID : **1860452325**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. Only sine terms with even harmonics.
✗ 2. Only sine terms with odd harmonics.
✓ 3. Only cosine terms with odd harmonics.
✗ 4. Only cosine terms with even harmonics.

Q.7 What will be the Gain Margin (GM) and the Phase Margin (PM) of a closed loop T.F $T(s) = 500000/(s^2 + 700s + 250000)$?

Question ID : **1860452312**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

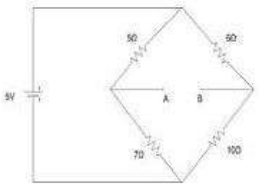
Ans
✓ 1. ∞, 35
✗ 2. ∞, 70
✗ 3. 60, 70
✗ 4. 60, 35

Q.8 Steady state error for an open loop system is 0.1. Steady state error for the previously mentioned system being closed loop with a unity negative feedback and a pulse input for 1s having magnitude of 10 is?

Question ID : **1860452311**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. 0.1
✓ 2. 0
✗ 3. 0.2
✗ 4. 0.02

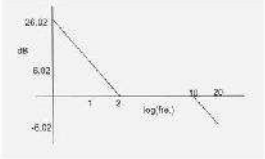
Q.9 Find Thevenin's equivalent resistance for the following circuit:



Question ID : **1860452320**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. 5.67 Ω
✓ 2. 6.66 Ω
✗ 3. 6 Ω
✗ 4. 6.33 Ω

Q.10 If the given system is connected to a unity negative feedback system, the steady state error of closed loop system to a ramp input is:



Question ID : **1860452313**
Status : **Not Answered**
Chosen Option : **--**

Ans
✗ 1. 0.01
✗ 2. 1
✓ 3. 0.5

✗ 4. 0.2

Q.11 _____ indicates not only whether a system is stable, but also its degree of stability and how stability may be improved if necessary.

Question ID : **1860452316**
Status : **Answered**
Chosen Option : **1**

Ans
✗ 1. Bode Plot
✗ 2. Polar Plot
✓ 3. Nyquist Plot
✗ 4. Nichols Plot

Q.12 If the output of the system at steady state doesn't agree with the input, then the system is said to have _____, which determines the _____ of the system.

Question ID : **1860452318**
Status : **Answered**
Chosen Option : **3**

Ans
✓ 1. Steady state error, accuracy
✗ 2. Residual error, overshoot
✗ 3. Steady state error, tolerance
✗ 4. Residual error, tolerance

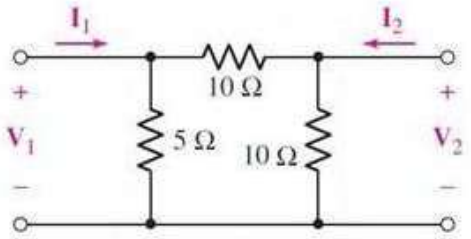
Q.13 The Transfer Function of lead and lag compensators have _____ and _____ phase angles respectively which makes the system _____ and _____ respectively.

Question ID : **1860452319**
Status : **Answered**
Chosen Option : **3**

Ans
✗ 1. –ve, –ve, slower, faster
✗ 2. +ve, +ve, slower, faster
✓ 3. +ve, –ve, faster, slower
✗ 4. –ve, +ve, faster, slower

Q.14 Find I_1 in the following circuit. $V_1 = V_2 = 1V$:

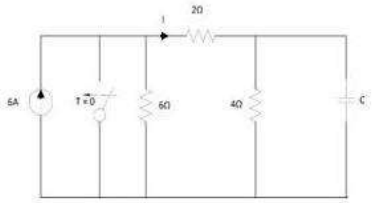
Question ID : **1860452322**
Status : **Answered**
Chosen Option : **2**



Ans
✗ 1. 0.1A
✗ 2. 0.4A
✗ 3. 0.3A
✓ 4. 0.2A

Q.15 In the given Circuit, the switch is closed at t = 0. Find the value of I.

Question ID : **1860452323**
Status : **Marked For Review**
Chosen Option : **1**



Ans
✗ 1. 6A
✗ 2. −3A
✗ 3. 3A
✓ 4. − 6A

Q.16 $\int_{-7}^{2}(t^2+t^3+1)\delta(t-3)dt =$ _____.

Question ID : **1860452324**
Status : **Not Attempted and**

Ans

1. 3
2. 37
3. 13
4. 0

Marked For Review

Chosen Option : --

Q.17 A. If the inputs to a control system are gradually changing functions of time, then a/an _____ function will be a good test signal.
B. If a system is subjected to sudden disturbances, a/an _____ function will be a good test signal.
C. For a system subjected to shock inputs, a/an _____ function will be a good test signal.

Question ID : **1860452317**

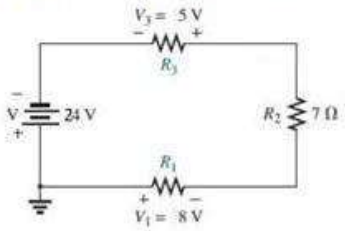
Status : **Answered**

Chosen Option : **3**

Ans

1. impulse, ramp, step
2. ramp, step, impulse
3. impulse, step, ramp
4. ramp, impulse, step

Q.18 Find the resistance R1 and R3 in the following circuit:



Question ID : **1860452321**

Status : **Not Attempted and Marked For Review**

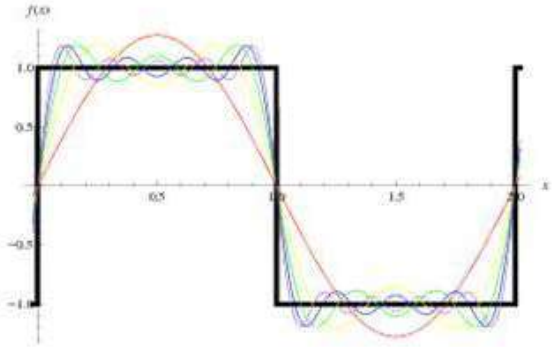
Chosen Option : **--**

Ans

1. 4.11, 6.78
2. 4.11, 5.78
3. 7.23, 3.19
4. 5.09, 3.18

Section : **Communication**

Q.1 The following image represents:



Question ID : **1860452331**

Status : **Answered**

Chosen Option : **2**

Ans

1. Wave Shaping
2. Shannon-Hartley Effect
3. Gibb's Phenomena
4. Aliasing

Q.2 Consider the 2 statements:

1) An odd and imaginary signal always has an odd and imaginary Fourier transform.
2) The convolution of an odd fourier transform with and even fourier transform is always even.

Which of the above statements is / are true:

Question ID : **1860452334**

Status : **Not Attempted and Marked For Review**

Chosen Option : **--**

Ans

1. None
2. 1 and 2
3. 1

✗ 4. 2

Q.3 Should the real time instruments like CRO and DSO be time invariant?

Question ID : **1860452329**
Status : **Answered**
Chosen Option : **1**

Ans
✓ 1. Yes
✗ 2. Never
✗ 3. Sometimes
✗ 4. No relation with the time invariance

Q.4 By the decomposition property of a linear system, we can separate out 2 components of the linear system namely:

Question ID : **1860452330**
Status : **Answered**
Chosen Option : **2**

Ans
✓ 1. Zero input component, zero state component
✗ 2. Steady state component, transient component
✗ 3. Linear component, non-linear component
✗ 4. Line and a Circle

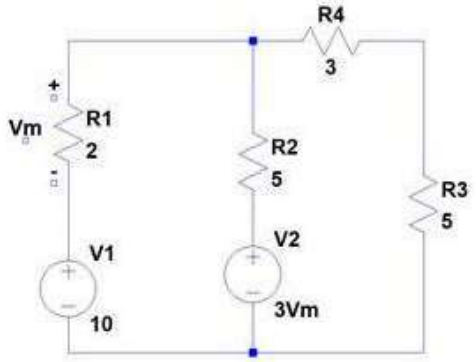
Q.5 Wattmeter deflection in AC circuits is proportional to the _____.

Question ID : **1860452337**
Status : **Answered**
Chosen Option : **4**

Ans
✗ 1. Voltage in the circuit
✓ 2. Average Power in the circuit
✗ 3. Instantaneous Power in the circuit
✗ 4. Maximum power in the circuit

Q.6 Find the current flowing through the resistor R3?

Question ID : **1860452328**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**



Ans
✗ 1. 0.48A
✓ 2. 0.96A
✗ 3. 0.24A
✗ 4. 1.2A

Q.7 Consider y1(t) = x(3t) and y2(t) = x(t/3). Consider the following statements:

1) If y1(t) and y2(t) are periodic, then x(t) is periodic.
2) If x(t) is periodic, then y1(t) and y2(t) are periodic.

Which of the above statements is/are true:

Question ID : **1860452333**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. None
✗ 2. 1
✓ 3. 1 and 2
✗ 4. 2

Q.8 An absolutely integrable signal x(t) is known to have a pole at s = 5. Which of the following statements are correct?

Question ID : **1860452336**
Status : **Answered**

Ans
✗ 1. x(t) is of finite duration

✔ 2. None

✘ 3. x(t) is right sided

✘ 4. x(t) is not feasible

Chosen Option : **3**

Q.9 Let x(t) be a signal with Nyquist rate w_0. Determine the Nyquist rate for $y(t) = x(t)\cos(w_0 t)$.

Ans

✘ 1. w_0

✘ 2. $2w_0$

✔ 3. $3w_0$

✘ 4. 2π

Question ID : **1860452335**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Q.10 Solve $15/t^2 = 2/3$:

Ans

✘ 1. +/– 2.122

✘ 2. +/– 2.568

✔ 3. +/– 2.372

✘ 4. +/– 2.188

Question ID : **1860452339**
Status : **Not Answered**
Chosen Option : **--**

Q.11 The signal $y(t) = T\{x(t)\} = \sin(2\pi t)*x(t) + u(t-2)$ is _____.

Ans

✘ 1. Linear, time variant, non-causal

✔ 2. Non-linear, time invariant, causal

✘ 3. Linear, time invariant, causal

✘ 4. Non-linear, time invariant, non-causal

Question ID : **1860452332**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Q.12 A die is tossed three times. What is the probability of getting an odd number at least once?

Ans

✘ 1. 7/16

✔ 2. 7/8

✘ 3. 3/16

✘ 4. 7/5

Question ID : **1860452338**
Status : **Not Answered**
Chosen Option : **--**

Section : **Electromagnetic**

Q.1 Light is good for telecommunications because it is:

Ans

✔ 1. a high-frequency carrier

✘ 2. not modulated

✘ 3. a very low-frequency carrier

✘ 4. a low-frequency carrier

Question ID : **1860452343**
Status : **Answered**
Chosen Option : **1**

Q.2 If σ is the conductivity, What is the relationship between the electric field E and the current density J in a conducting medium?

Ans

✔ 1. $\sigma = J/E$

✘ 2. $\sigma = 1/(EJ)$

✘ 3. $\sigma = E/J$

✘ 4. $\sigma = EJ$

Question ID : **1860452344**
Status : **Marked For Review**
Chosen Option : **1**

Q.3 What is meant by the polarisation of electromagnetic waves?

Ans

✘ 1.
The polarisation is the direction of the electric current in an electromagnetic wave.

✔ 2.

Question ID : **1860452345**
Status : **Marked For Review**
Chosen Option : **1**

The polarisation is the direction of the electric field in an electromagnetic wave.

✗ 3.
The polarisation is the magnitude of the voltage in an electromagnetic wave.

✗ 4.
The polarisation is the inverse of the electric field in an electromagnetic wave.

Q.4 Find the gradient of the curve $y = 3x^2 - 7x + 2$ at the point $(1, -2)$:

Question ID : **1860452340**
Status : **Not Attempted and Marked For Review**
Chosen Option : **--**

Ans
✗ 1. 1
✗ 2. -2
✗ 3. 2
✓ 4. -1

Q.5 Consider an interface between two dielectric materials, one with ε_r 2 while the other has ε_r 5. If the tangential component of electric field on one side of the interface has a magnitude of $10 V.m^{-1}$ what is the magnitude of the tangential component of electric field on the other side?

Question ID : **1860452342**
Status : **Not Answered**
Chosen Option : **--**

Ans
✓ 1. $10 V.m^{-1}$
✗ 2. $20 V.m^{-1}$
✗ 3. $2 V.m^{-1}$
✗ 4. $5 V.m^{-1}$

Q.6 The wave impedance of a medium is equal to:

Question ID : **1860452341**
Status : **Answered**
Chosen Option : **3**

Ans
✗ 1. the refractive index of the medium

✗ 2.
the refractive index of the medium divided by the wave impedance of free-space

✓ 3.
the wave impedance of free-space divided by the refractive index of the medium

✗ 4. the wave impedance of free-space