GATE-2013

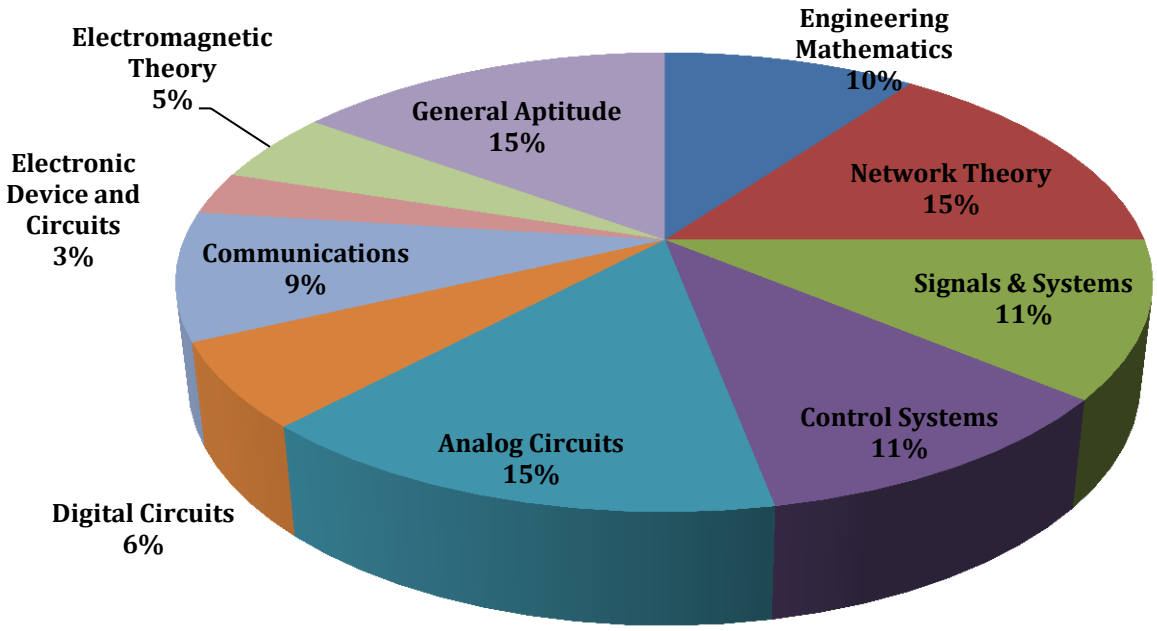
Question Paper

&

Answer Keys

Index

ANALYSIS OF GATE 2013
Electronics and Communication Engineering



GATE-2013- ECE

SUBJECT	NO OF QUESTION	Topics Asked in Paper	Total Marks
Engineering Mathematics	1M:4 2M:3	Linear Algebra, Probability and Distribution, Numerical Method, Calculus Differential Equation	10
Network Theory	1M:3 2M:6	Network Solution and methodology Transient /Study State Analysis of RLC Circuit to DC input, Sinusoidal study state Analysis Laplace transforms	15
Signals & Systems	1M:5 2M:3	Introduction to S&S, Linear Time invariant (LTI)System, Fourier Representation of signal Laplace Transform, Frequency Response of LTI System	11
Control Systems	1M:3 2M:4	Basic of Control System, Time domain Analysis Frequency Response Analysis Nyquist Plot Frequency response Analysis using bode plot State Variable Analysis	11
Analog Circuits	1M:3 2M:6	Diode –Circuit –Analysis &Application DC Biasing-BJTs, BJT &JFET Frequency Response, Feedback Oscillator Circuit Feedback Amplifiers, Operational Amplifier and Its Application	15
Digital Circuits	1M:2 2M:2	Number System &Code Conversion Boolean Algebra & KMap, Logic GATE Families Introduction to Microprocessor	6
Communications	1M:1 2M:4	DSBSC, SSB, and VSB, modulation, Receiver, Digital Communication	9
Electronic Device and Circuits	1M:3 2M:0	P-n Junction Theory R Characteristics FET(TEFT,MOSFET,)& CMOS	3
Electromagnetic Theory	1M:1 2M:2	Electronics & Magnetic Field Electromagnetic Waves	5
General Aptitude	1M:5 2M:5	Numerical Ability Verbal Ability	15
Total	**65**		**100**

GATE 2013 Examination

Electronics and Communication Engineering

Q.1 - Q.25 Carry One Mark each.

1. A bulb in a staircase has two switches, one switch being at the ground floor and the other one at the first floor. The bulb can be turned ON and also can be turned OFF by any one of the switch irrespective of the state of the other switch. The logic of switching of the bulb resembles
   (A) An AND gate
   (B) An OR gate
   (C) A XOR gate
   (D) A NAND gate
   [Ans. C]

2. Consider a vector field $\vec{A}(\vec{r})$. The closed loop line integral $\oint \vec{A} \bullet d\vec{l}$ can be expressed as
   (A) $\oiint (\nabla \times \vec{A}) \bullet \overrightarrow{ds}$ over the closed surface bounded by the loop
   (B) $\oiiint (\nabla \bullet \vec{A})$ dv over the closed volume bounded by the loop
   (C) $\iiint (\nabla \bullet \vec{A})$ dv over the open volume bounded by the loop
   (D) $\iint (\nabla \times \vec{A}) \bullet \overrightarrow{ds}$ over the open surface bounded by the loop
   [Ans. D]

3. Two systems with impulse responses $h_1(t)$ and $h_2(t)$ are connected in cascade. Then the overall impulse response of the cascaded system is given by
   (A) Product of $h_1(t)$ and $h_2(t)$
   (B) Sum of $h_1(t)$ and $h_2(t)$
   (C) Convolution of $h_1(t)$ and $h_2(t)$
   (D) Subtraction of $h_2(t)$ from $h_1(t)$
   [Ans. C]

4. In a forward biased pn junction diode, the sequence of events that best describes the mechanism of current flow is
   (A) Injection, and subsequent diffusion and recombination of minority carriers
   (B) Injection, and subsequent drift and generation of minority carriers
   (C) Extraction, and subsequent diffusion and generation of minority carriers
   (D) Extraction, and subsequent drift and recombination of minority carriers
   [Ans. A]

5. In IC technology, dry oxidation (using dry oxygen) as compared to wet oxidation (using steam or water vapor) produces
   (A) Superior quality oxide with a higher growth rate
   (B) Inferior quality oxide with a higher growth rate
   (C) Inferior quality oxide with a lower growth rate
   (D) Superior quality oxide with a lower growth rate
   [Ans. D]

6. The maximum value of θ until which the approximation $\sin\theta \approx \theta$ holds to within 10% error is
   (A) 10^0
   (B) 18^0
   (C) 50^0
   (D) 90^0
   [Ans. B]

7. The divergence of the vector field $\vec{A} = x\hat{a}_x + y\hat{a}_y + z\hat{a}_z$ is

(A) 0
(B) 1/3
(C) 1
(D) 3

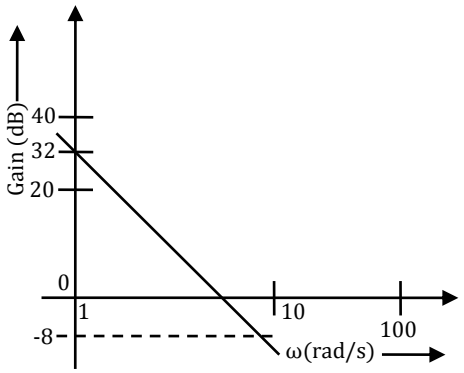
[Ans. D]

8. The impulse response of a system is
$h(t) = tu(t)$. For an input $u(t-1)$, the output is

(A) $\frac{t^2}{2}u(t)$
(B) $\frac{t(t-1)}{2}u(t-1)$
(C) $\frac{(t-1)^2}{2}u(t-1)$
(D) $\frac{t^2-1}{2}u(t-1)$

[Ans. C]

9. The Bode plot of a transfer function G(s) is shown in the figure below.

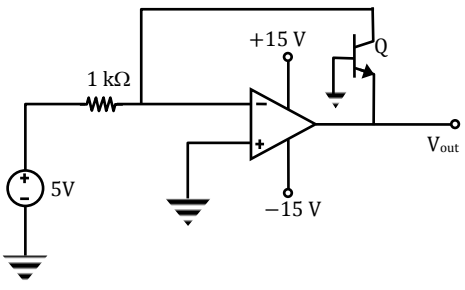


The gain (20 log|G(s)|) is 32 dB and -8 dB at 1 rad/s and 10 rad/s respectively. The phase is negative for all ω. Then G(s) is

(A) $\frac{39.8}{s}$
(B) $\frac{39.8}{s^2}$
(C) $\frac{32}{s}$
(D) $\frac{32}{s^2}$

[Ans. B]

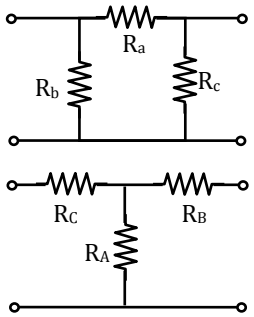
10. In the circuit shown below what is the output voltage (V_{out}) if a silicon transistor Q and an ideal op – amp are used?



(A) −15 V
(B) −0.7 V
(C) +0.7 V
(D) +15 V

[Ans. B]

11. Consider a delta connection of resistors and its equivalent star connection as shown. If all elements of the delta connection are scaled by a factor k, k>0, the elements of the corresponding star equivalent will be scaled by a factor of



(A) k^2
(B) k
(C) 1/k
(D) $\sqrt{k}$

[Ans. B]

12. For 8085 microprocessor, the following program is executed.

```
    MVI A, 05H;
    MVI B, 05H;
PTR: ADD B;
    DCR B;
    JNZ PTR;
    ADI 03H;
    HLT;
```

At the end of program, accumulator contains

(A) 17H
(B) 20H
(C) 23H
(D) 05H

[Ans. B]

13. The bit rate of a digital communication system is R kbits/s. The modulation used is 32-QAM. The minimum bandwidth required for ISI free transmission is

(A) R/10 Hz
(B) R/10 kHz
(C) R/5 Hz
(D) R/5 kHz

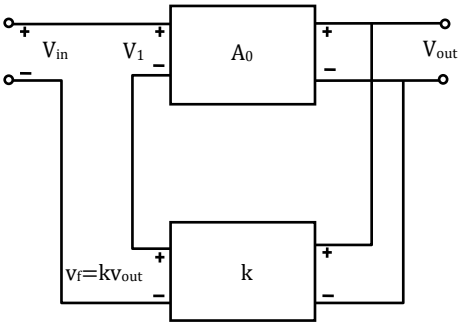
[Ans. B]

14. For a periodic signal
$v(t) = 30\sin 100t + 10\cos 300t + 6\sin(500t + \pi/4)$, the fundamental frequency in rad/s is

(A) 100
(B) 300
(C) 500
(D) 1500

[Ans. A]

15. In the feedback network shown below , if the feedback factor k is increased , then the



(A) Input impedance increases and output impedance decreases
(B) Input impedance increases and output impedance also increases
(C) Input impedance decreases and output impedance also decreases
(D) Input impedance decreases and output impedance increases
[Ans. A]

16. A band-limited signal with a maximum frequency of 5 kHz is to be sampled. According to the sampling theorem, the sampling frequency which is not valid is
(A) 5 kHz
(B) 12 kHz
(C) 15 kHz
(D) 20 kHz
[Ans. A]

17. In a MOSFET operating in the saturation region, the channel length modulation effect causes
(A) An increase in the gate – source capacitance
(B) A decrease in the transconductance
(C) A decrease in the unity –gain cutoff frequency
(D) A decrease in the output resistance
[Ans. D]

18. Which one of the following statement is NOT TRUE for a continuous time causal and stable LTI system?
(A) All the poles of the system must lie on the left side of the jω axis.
(B) Zeros of the system can lie anywhere in the s-plane
(C) All the poles must lie within $|s| = 1$
(D) All the root of the characteristic equation must be located on the left side of the jω axis.
[Ans. C]

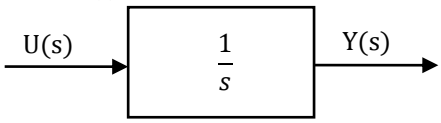
19. The minimum Eigenvalue of the following matrix is

$$\begin{bmatrix} 3 & 5 & 1 \\ 5 & 12 & 7 \\ 2 & 7 & 5 \end{bmatrix}$$

(A) 0
(B) 1
(C) 2
(D) 3
[Ans. A]

20. A polynomial
$f(x) = a_4x^4 + a_3x^3 + a_2x^2 + a_1x - a_0$ with all coefficients positive has
(A) No real root
(B) No negative real root
(C) Odd number of real roots
(D) At least one positive and one negative real root
[Ans. D]

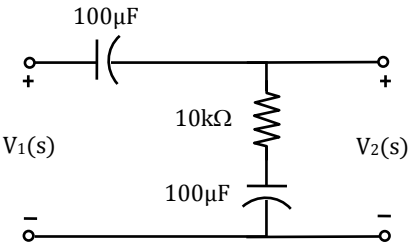
21. Assuming zero initial condition, the response y(t) of the system given below to a unit step input u(t) is



(A) u(t)
(B) t u(t)
(C) $\frac{t^2}{2}u(t)$
(D) $e^{-t}u(t)$

[Ans. B]

22. The transfer function $\frac{V_2(s)}{V_1(s)}$ of the circuit shown below is



(A) $\frac{0.5s+1}{s+1}$
(B) $\frac{3s+6}{s+2}$
(C) $\frac{s+2}{s+1}$
(D) $\frac{s+1}{s+2}$

[Ans. D]

23. A source $v_s(t) = V\cos 100\pi t$ has an internal impedance of $(4 + j3)\ \Omega$. If a purely resistive load connected to this source has to extract the maximum power out of the source , its value in Ω should be
(A) 3
(B) 4
(C) 5
(D) 7
[Ans. C]

24. The return loss of a device is found to be 20 dB. The voltage standing wave ratio (VSWR) and magnitude of reflection coefficient is respectively
(A) 1.22 and 0.1
(B) 0.81 and 0.1
(C) −1.22 and 0.1
(D) 2.44 and 0.2
[Ans. A]

25. Let $g(t) = e^{-\pi t^2}$, and h(t) is a filter matched to g(t). If g(t) is applied as input to h(t) , then the Fourier transform of the output is

(A) $e^{-\pi f^2}$
(B) $e^{-\pi f^2/2}$
(C) $e^{-\pi|f|}$
(D) $e^{-2\pi f^2}$

[Ans. D]

Q.26 - Q.55 Carry Two Mark each.

26. Let U and V be two independent zero mean Gaussian random variables of variances 1/4 and 1/9 respectively. The probability $P(3V \geq 2U)$ is

(A) 4/9
(B) 1/2
(C) 2/3
(D) 5/9

[Ans. B]

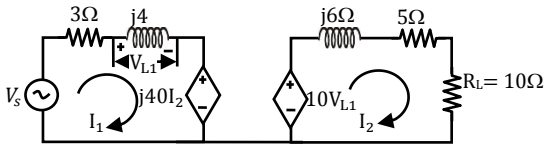
27. Let A be a m × n matrix and B be a n × m matrix. It is given that Determinant$(I_m + AB)$ = determinant $(I_n + AB)$, where I_k is the k × k identity matrix. Using the above property, the determinant of the matrix given below is

$$\begin{bmatrix} 2 & 1 & 1 & 1 \\ 1 & 2 & 1 & 1 \\ 1 & 1 & 2 & 1 \\ 1 & 1 & 1 & 2 \end{bmatrix}$$

(A) 2
(B) 5
(C) 8
(D) 16

[Ans. B]

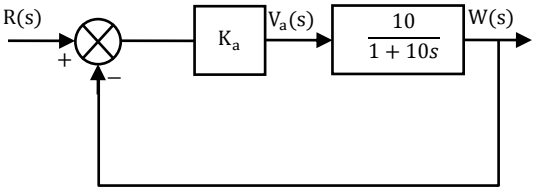
28. In the circuit shown below, if the source voltage $V_s = 100\angle 53.13^0$ V then the Thevenin's equivalent voltage in volts as seen by the load resistance R_L is



(A) $100\angle 90^0$
(B) $800\angle 0^0$
(C) $800\angle 90^0$
(D) $100\angle 60^0$

[Ans. C]

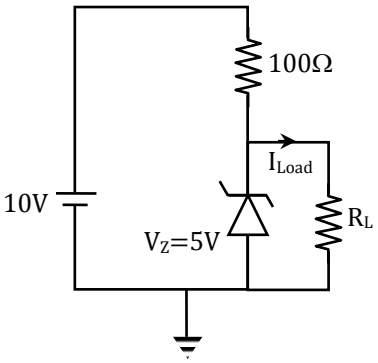
29. The open – loop transfer function of a dc motor is given as $\frac{W(s)}{V_a(s)} = \frac{10}{1+10s}$. When connected in feedback as shown below, the approximate value of K_a that will reduce the time constant of closed loop system by one hundred times as compared to that of the open – loop system is



(A) 1
(B) 5
(C) 10
(D) 100

[Ans. C]

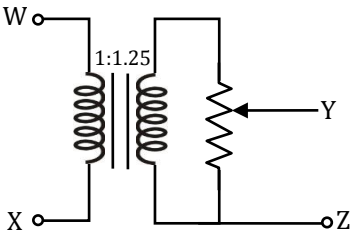
30. In the circuit shown below, the knee current of the ideal Zener diode is 10 mA. To maintain 5 V across R_L, the minimum value of R_L in Ω and the minimum power rating of the Zener diode in mW, respectively , are



(A) 125 and 125
(B) 125 and 250
(C) 250 and 125
(D) 250 and 250

[Ans. B]

31. The following arrangement consists of an ideal transformer and an attenuator which attenuates by a factor of 0.8. An ac voltage $V_{WX1} = 100V$ is applied across WX to get an open circuit voltage V_{YZ1} across YZ. Next , an ac voltage $V_{YZ2} = 100V$ is applied across YZ to get an open circuit voltage V_{WX2} across WX. Then,V_{YZ1} /V_{WX1}, V_{WX2}/$V_{YZ2}$are respectively.



(A) 125/100 and 80/100
(B) 100/100 and 80/100
(C) 100/100 and 100/100
(D) 80/100 and 80/100

[Ans. B]

32. Two magnetically uncoupled inductive coils have Q factors q_1 and q_2 at the chosen operating frequency. Their respective resistances are R_1 and R_2. When connected in series, their effective Q factor at the same operating frequency is

(A) $q_1 + q_2$
(B) $(1/q_1) + (1/q_2)$
(C) $(q_1R_1 + q_2R_2)/(R_1 + R_2)$
(D) $(q_1R_2 + q_2R_1)/(R_1 + R_2)$

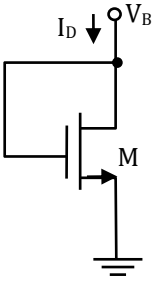
[Ans. C]

33. AThe impulse response of a continuous time system is given by $h(t) = \delta(t-1) + \delta(t-3)$. The value of the step response at $t = 2$ is

(A) 0
(B) 1
(C) 2
(D) 3

[Ans. B]

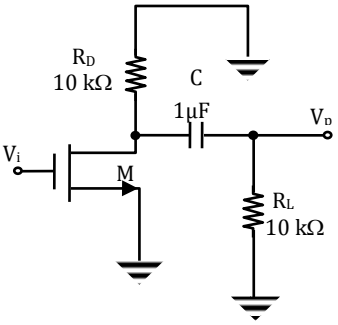
34. The small-signal resistance(i.e., dV_B/dI_D) in kΩ offered by the n – channel MOSFET M shown in the figure below, at a bias point of V_B =2V is (device data for M: device trans conductance parameter $k_n = \mu_n C_{ox}(W/L) = 40\mu A/V^2$, threshold voltage V_{TN}=1V and neglect body effect and channel length modulation effects)



(A) 12.5
(B) 25
(C) 50
(D) 100

[Ans. B]

35. The ac schematic of an NMOS common – source stage is shown in the figure below, where part of the biasing circuits has been omitted for simplicity. For the n- channel MOSFET M, the transconductance g_m =1mA/V, and body effect and channel length modulation effect are to be neglected. The lower cutoff frequency in Hz of the circuit is approximately at



(A) 8
(B) 32
(C) 50
(D) 200

[Ans. A]

36. A system is described by the differential equation $\frac{d^2y}{dt^2} + 5\frac{dy}{dt} + 6y(t) = x(t)$. Let x(t) be a rectangular pulse given by

$$x(t) = \begin{cases} 1 & 0 < t < 2 \\ 0 & \text{otherwise} \end{cases}$$

Assuming that $y(0) = 0$ and $\frac{dy}{dt} = 0$ at $t = 0$, the Laplace transform of y(t) is

(A) $\frac{e^{-2s}}{s(s+2)(s+3)}$
(B) $\frac{1-e^{-2s}}{s(s+2)(s+3)}$
(C) $\frac{e^{-2s}}{(s+2)(s+3)}$
(D) $\frac{1-e^{-2s}}{s(s+2)(s+3)}$

[Ans. B]

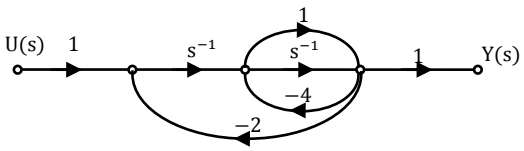
37. A system described by a linear, constant coefficient, ordinary, first order differential equation has an exact solution given by y(t)for $t > 0$, when the forcing function is x(t) and the initial condition is y(0). If one wishes to modify the system so that the solution becomes – 2y(t) for $t > 0$, we need to
(A) Change the initial condition to – y(0) and the forcing function to 2x(t)
(B) Change the initial condition to 2y(0) and the forcing function to –x(t)
(C) Change the initial condition to $j\sqrt{2}y(0)$ and the forcing function to $j\sqrt{2}x(t)$
(D) Change the initial condition to – 2y (0) and the forcing function to – 2x(t)
[Ans. D]

38. Consider two identically distributed zero-mean random variables U and V. Let the cumulative distribution functions of U and 2V be F(x) and G(x) respectively. Then, for all values of x
(A) $F(x) - G(x) \leq 0$
(B) $F(x) - G(x) \geq 0$
(C) $\big(F(x) - G(x)\big).x \leq 0$
(D) $\big(F(x) - G(x)\big).x \geq 0$

[Ans. D]

39. The DFT of a vector [a b c d] is the vector [α β γ δ]. Consider the product
$[p\ q\ r\ s] = [a\ b\ c\ d]\begin{bmatrix} a & b & c & d \\ d & a & b & c \\ c & d & a & b \\ b & c & d & a \end{bmatrix}$. The DFT of the vector [p q r s] is a scaled version of
(A) $[\alpha^2\ \beta^2\ \gamma^2\ \delta^2]$
(B) $\left[\sqrt{\alpha}\ \sqrt{\beta}\ \sqrt{\gamma}\ \sqrt{\delta}\right]$
(C) $[\alpha+\beta\ \ \beta+\delta\ \ \delta+\gamma\ \ \gamma+\alpha]$
(D) $[\alpha\ \beta\ \gamma\ \delta]$
[Ans. A]

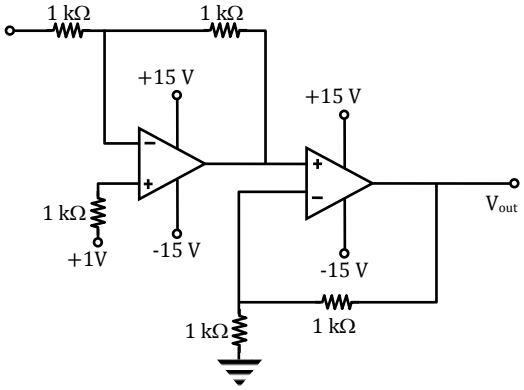
40. The signal flow graph for a system is given below. The transfer function $\frac{Y(s)}{U(s)}$ for this system is given as



(A) $\frac{s+1}{5s^2+6s+2}$ (B) $\frac{s+1}{s^2+6s+2}$ (C) $\frac{s+1}{s^2+4s+2}$ (D) $\frac{1}{5s^2+6s+2}$

[Ans. A]

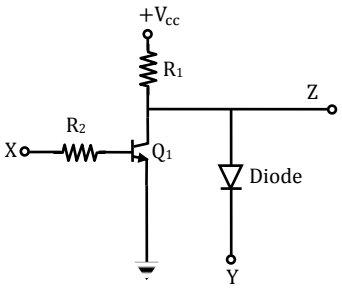
41. In the circuit shown below the op – amps are ideal. The V_{out} in Volts is



(A) 4
(B) 6
(C) 8
(D) 10

[Ans. C]

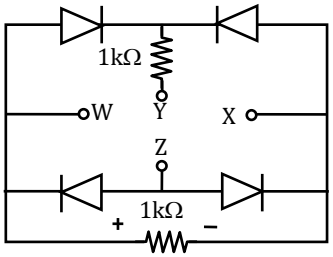
42. In the circuit shown below, Q_1 has negligible collector – to – emitter saturation voltage and the diode drops negligible voltage across it under forward bias. If V_{cc} is +5 V, X and Y are digital signals with 0 V as logic 0 and V_{cc} as logic 1, then the Boolean expression for Z is



(A) XY
(B) $\overline{X}Y$
(C) $X\overline{Y}$
(D) $\overline{XY}$

[Ans. B]

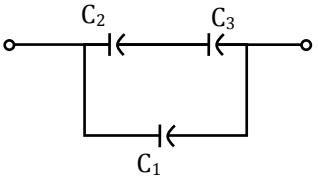
43. A voltage 1000 sin ωt Volts is applied across YZ. Assuming ideal diodes, the voltage measured across WX in Volts, is



(A) sin ωt
(B) $(\sin\omega t - |\sin\omega t|)/2$
(C) $(\sin\omega t + |\sin\omega t|)/2$
(D) 0 for all t

[Ans. D]

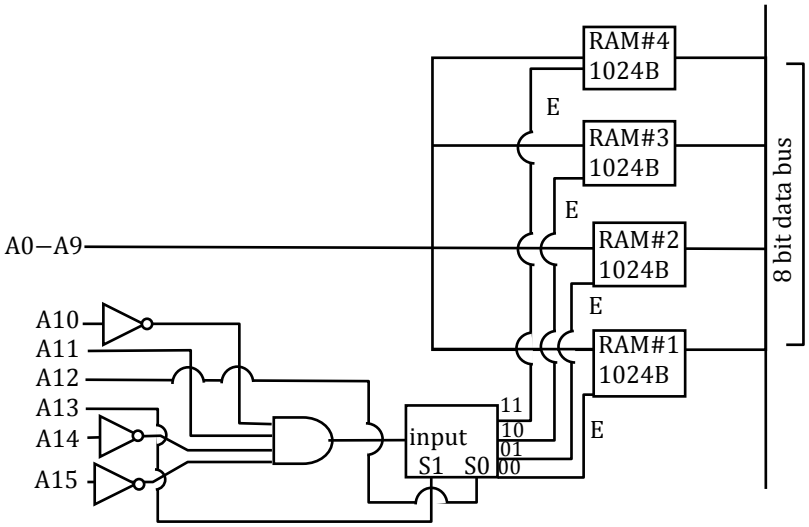
44. Three capacitors C_1, C_2 and C_3 whose values are 10μF, 5μF, and 2μF respectively, have breakdown voltages of 10V, 5V and 2V respectively. For the interconnection shown below , the maximum safe voltage in Volts that can be applied across the combination, and the corresponding total charge in μC stored in the effective capacitance across the terminals are respectively,



(A) 2.8 and 36
(B) 7 and 119
(C) 2.8 and 32
(D) 7 and 80

[Ans. C]

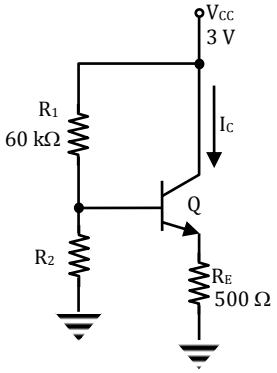
45. There are four chips each of 1024 bytes connected to a 16 bit address bus as shown in the figure below. RAMs 1, 2, 3 and 4 respectively are mapped to addresses



(A) 0C00H–0FFFH, 1C00H–1FFFH, 2C00H–2FFFH, 3C00H–3FFFH
(B) 1800H–1FFFH, 2800H–2FFFH, 3800H–3FFFH, 4800H–4FFFH
(C) 0500H–08FFH, 1500H–18FFH, 3500H–38FFH, 5500H–58FFH
(D) 0800H–0BFFH, 1800H–1BFFH, 2800H–2BFFH, 3800H–3BFFH

[Ans. D]

46. In the circuit shown below, the silicon npn transistor Q has a very high value of β. The required value of R_2 in kΩ to produce $I_C = 1mA$ is



(A) 20
(B) 30
(C) 40
(D) 50

[Ans. C]

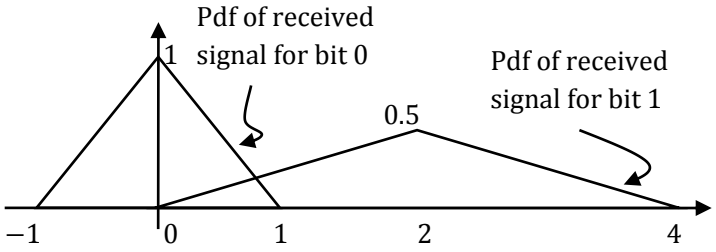
47. Let U and V be two independent and identically distributed random variables such that $P(U = +1) = P(U = -1) = {}^1/_2$. The entropy H(U+V) in bits is

(A) ${}^3/_4$
(B) 1
(C) ${}^3/_2$
(D) $\log_2 3$

[Ans. C]

Common Data for Questions 48 and 49

Bits 1 and 0 are transmitted with equal probability. At the receiver, the PDF of the respective received signals for both bits are as shown below.



48. If the deflection threshold is 1, the BER will be

(A) 1/2
(B) 1/4
(C) 1/8
(D) 1/16

[Ans. D]

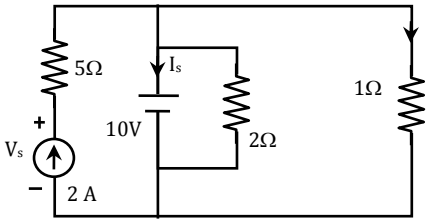
49. The optimum threshold to achieve minimum bit error rate (BER) is

(A) 1/2
(B) 4/5
(C) 1
(D) 3/2

[Ans. B]

Common Data for Questions 50 and 51

Consider the following figure



50. The current I_s in Amps in the voltage source, and voltage V_s is Volts across the current source respectively , are

(A) $13, -20$
(B) $8, -10$
(C) $-8, 20$
(D) $-13, 20$

[Ans. D]

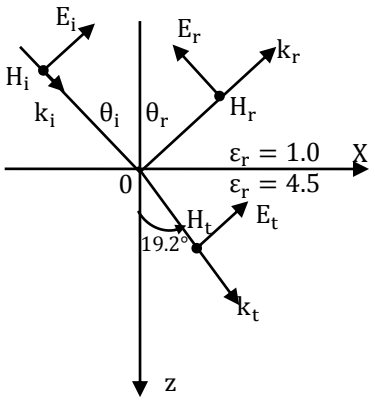
51. The current in the 1Ω resistor in Amps is

(A) 2
(B) 3.33
(C) 10
(D) 12

[Ans. C]

Statement for Linked Answer Questions 52 and 53

A monochromatic plane wave of wavelength $\lambda = 600\mu m$ is propagating in the direction as shown in the figure below. $\vec{E}_i, \vec{E}_r$, and $\vec{E}_t$ denote incident, reflected, and transmitted electric field vectors associated with the wave



52. The angle of incidence θ_i and the expression for $\vec{E}_i$ are

(A) $60°$ and $\frac{E_0}{\sqrt{2}}(\hat{a}_x - \hat{a}_z)e^{-j\frac{\pi\times10^4(x+z)}{3\sqrt{2}}}$ V/m

(B) $45°$ and $\frac{E_0}{\sqrt{2}}(\hat{a}_x + \hat{a}_z)e^{-j\frac{\pi\times10^4 z}{3}}$ V/m

(C) $45°$ and $\frac{E_0}{\sqrt{2}}(\hat{a}_x - \hat{a}_z)e^{-j\frac{\pi\times10^4(x+z)}{3\sqrt{2}}}$ V/m

(D) $60°$ and $\frac{E_0}{\sqrt{2}}(\hat{a}_x - \hat{a}_z)e^{-j\frac{\pi\times10^4 z}{3}}$ V/m

[Ans. C]

53. The expression for $\vec{E}_r$ is

(A) $0.23\frac{E_0}{\sqrt{2}}(\hat{a}_x + \hat{a}_z)\, e^{-j\frac{\pi\times10^4(x-z)}{3\sqrt{2}}}$ V/m

(B) $-\frac{E_0}{\sqrt{2}}(\hat{a}_x + \hat{a}_z)\, e^{j\frac{\pi\times10^4 z}{3}}$ V/m

(C) $0.44\frac{E_0}{\sqrt{2}}(\hat{a}_x + \hat{a}_z)\, e^{-j\frac{\pi\times10^4(x-z)}{3\sqrt{2}}}$ V/m

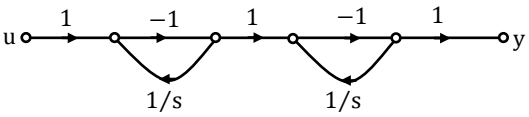
(D) $\frac{E_0}{\sqrt{2}}(\hat{a}_x + \hat{a}_z)\, e^{-j\frac{\pi\times10^4(x-z)}{3}}$ V/m

[Ans. A]

Statement for Linked Answer Questions 54 and 55

The state diagram of a system is shown below. A system is described by the state – variable equations

$\dot{X} = AX + Bu;\ \ y = CX + Du$



54. The state – variable equation of the system shown in the figure above are

(A) $\dot{X} = \begin{bmatrix} -1 & 0 \\ 1 & -1 \end{bmatrix} X + \begin{bmatrix} -1 \\ 1 \end{bmatrix} u$

$y = [1\ \ -1]X + u$

(B) $\dot{X} = \begin{bmatrix} -1 & 0 \\ -1 & -1 \end{bmatrix} X + \begin{bmatrix} -1 \\ 1 \end{bmatrix} u$
$y = [-1 \ -1]X + u$

(C) $\dot{X} = \begin{bmatrix} -1 & 0 \\ -1 & -1 \end{bmatrix} X + \begin{bmatrix} -1 \\ 1 \end{bmatrix} u$
$y = [-1 \ -1]X - u$

(D) $\dot{X} = \begin{bmatrix} -1 & -1 \\ 0 & -1 \end{bmatrix} X + \begin{bmatrix} -1 \\ 1 \end{bmatrix} u$
$y = [1 \ -1]X - u$

[Ans. A]

55. The state transition matrix e^{At} of the system shown in the figure above is

(A) $\begin{bmatrix} e^{-t} & 0 \\ te^{-t} & e^{-t} \end{bmatrix}$

(B) $\begin{bmatrix} e^{-t} & 0 \\ -te^{-t} & e^{-t} \end{bmatrix}$

(C) $\begin{bmatrix} e^{-t} & 0 \\ e^{-t} & e^{-t} \end{bmatrix}$

(D) $\begin{bmatrix} e^{-t} & te^{-t} \\ 0 & e^{-t} \end{bmatrix}$

[Ans. A]

General Aptitude One Marks Question Q. 56 to Q. 60

56. Choose the grammatically CORRECT sentence:

(A) Two and two add four
(B) Two and two become four
(C) Two and two are four
(D) Two and two make four

[Ans. D]

57. Statement: You can always give me a ring whenever you need.
Which one of the following is the best inference from the above statement?

(A) Because I have a nice caller tune
(B) Because I have a better telephone facility
(C) Because a friend in need in a friend indeed
(D) Because you need not pay towards the telephone bills when you give me a ring

[Ans. C]

58. In the summer of 2012, in New Delhi, the mean temperature of Monday to Wednesday was 41ºC and of Tuesday to Thursday was 43ºC. If the temperature on Thursday was 15% higher than that of Monday, then the temperature in ºC on Thursday was

(A) 40
(B) 43
(C) 46
(D) 49

[Ans. C]

59. Complete the sentence:
Dare _____ mistakes.

(A) commit
(B) to commit
(C) committed
(D) committing

[Ans. B]

60. They were requested not to quarrel with others.
Which one of the following options is the closest in meaning to the word quarrel?
(A) make out
(B) call out
(C) dig out
(D) fall out
[Ans. C]

General Aptitude Two Marks Question Q. 61 to Q. 65

61. A car travels 8 km in the first quarter of an hour, 6 km in the second quarter and 16 km in the third quarter. The average speed of the car in km per hour over the entire journey is
(A) 30
(B) 36
(C) 40
(D) 24
[Ans. C]

62. Find the sum to n terms of the series $10 + 84 + 734 + \ldots$
(A) $\frac{9(9^n + 1)}{10} + 1$
(B) $\frac{9(9^n - 1)}{8} + 1$
(C) $\frac{9(9^n - 1)}{8} + n$
(D) $\frac{9(9^n - 1)}{8} + n^2$
[Ans. D]

63. Statement: There were different streams of freedom movements in colonial India carried out by the moderates, liberals, radicals, socialists, and so on.
Which one of the following is the best inference from the above statement?
(A) The emergence of nationalism in colonial India led to our Independence
(B) Nationalism in India emerged in the context of colonialism
(C) Nationalism in India is homogeneous
(D) Nationalism in India is heterogeneous
[Ans. D]

64. The set of values of p for which the roots of the equation $3x^2 + 2x + p(p - 1) = 0$ are of opposite sign is
(A) $(-\infty, 0)$
(B) $(0, 1)$
(C) $(1,\infty)$
(D) $(0,\infty)$
[Ans. B]

65. What is the chance that a leap year, selected at random, will contain 53 Sundays?
(A) 2/7
(B) 3/7
(C) 1/7
(D) 5/7
[Ans. A]