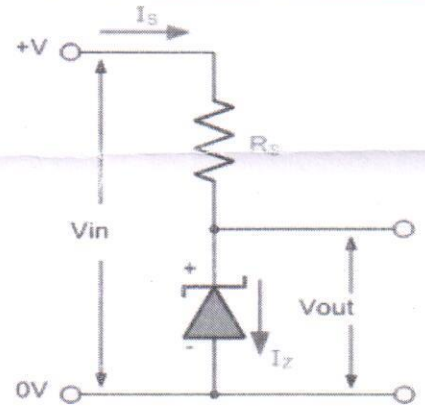
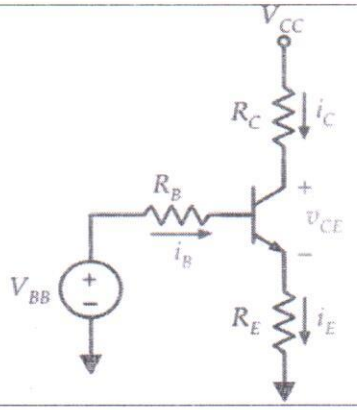
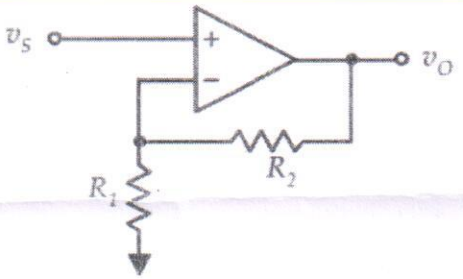
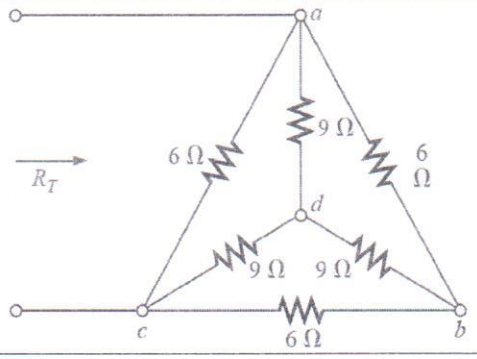
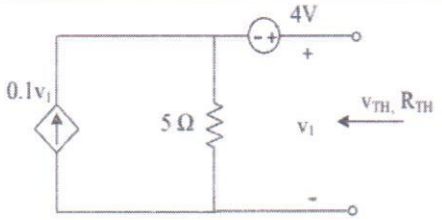
ECE

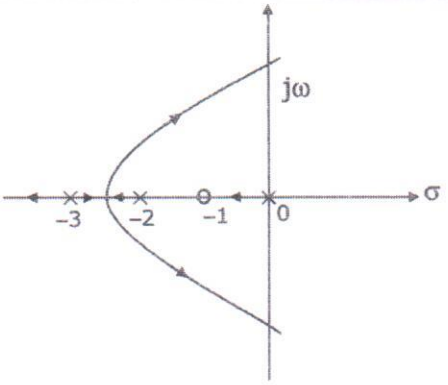
Q. No.	Question
1.	For the given matrix M. Find all the eigen values. $M = \begin{bmatrix} 2 & -3 & 0 \\ 2 & -5 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ A. 2, -5, 3 B. 3, 1, -4 C. 0, 0, 3 D. 4, 1, -4
2.	Let P and Q are square matrices such that PQ=I, then zero is an eigen value of A. P but not of Q B. Q but not of P C. both P and Q D. neither P nor Q
3.	Given $P = e^{-x} \sin y\, i - e^{-x} \cos y\, j$. Find divergence of P. A. 3 B. 2 C. 0 D. 1
4.	Find the value of Stoke's theorem for $y\, i + z\, j + x\, k$. A. $-i - j - k$ B. $i + j$ C. $j + k$ D. $i + j + k$
5.	Calculate the Green's value for the functions $F = y^2$ and $G = x^2$ for the region $x = 1$ and $y = 2$ from origin. A. 0 B. 2 C. -2 D. 1
6.	Which of the following is incorrect with respect to use of Poisson distribution? A. Modeling event/time data B. Modeling bounded count data C. Modeling contingency tables D. All of the Mentioned
7.	$P(A \cap B) = 3/5$, then $P(A' \cap B')$ A. 1/5 B. 2/5 C. 3/5 D. 1
8.	Determine the type of extrinsic semiconductor and find the position of the Fermi level with respect to intrinsic fermi level at temperature 300K for a Silicon is doped with boron atoms with Impurity density 2×10^{16} cm^{-3}. A. P-type semiconductor with 0.365eV below intrinsic fermi level. B. n-type semiconductor with 0.365eV below intrinsic fermi level. C. P-type semiconductor with 0.365eV above intrinsic fermi level. D. n-type semiconductor with 0.365eV below intrinsic fermi level.

9.	The zero bias capacitance for an abrupt pn junction is 20pF. Calculate the capacitance when the reverse bias of -7V is applied. A. 5.16uF B. 51.6pF C. 5.16pF D. 51.6uF
10.	Find diode voltage for diode with given specifications: (I_S, I_D) = (0.1 fA, 300 μA) at room-temperature dc operation with V_T = 0.025 V and η =1. A. 1.1V B. 0.718 V C. 1.7V D. 0.3V
11.	A 5.0V stabilised power supply is required to be produced from a 12V DC power supply input source. The maximum power rating P_Z of the zener diode is 2W. Using the zener regulator circuit above calculate: maximum current flowing through the zener diode and minimum value of the series resistor, R_S A. 4mA, 17.5Ω B. 400mA, 175Ω C. 4mA, 175Ω D. 400mA, 17.5Ω 
12.	Find the dc output voltage (Vdc) and output current (Idc) for a half-wave rectifier. Given data: secondary voltage V_{rms} = 12.6V (60 Hz), R = 15Ω, C=25,000μF, V_{on} = 1 V. A. 16.8V, 1.12A B. 1.68V, 1.12A C. 16.8V, 11.2A D. 16.8V, 1.12mA
13.	The drain current in enhancement MOSFET is I_D = 3mA at V_{GS} = 10V and V_{th}= 5V. Determine the drain current I_D for V_{GS} = 8V. A. 1.08mA B. 10.08mA C. 3.08mA D. 2mA
14.	The BJT with h_{fe}=200, I_B=10μA and I_C =400mA is operating in A. Active Region B. Cut-off Region C. Saturation Region D. either Active or Saturation Region

15.	In the circuit, V_{CC} = 6V, V_{BB} = 3V, R_B = 100 kΩ, R_E = 7 kΩ, R_C = 19 kΩ, and β = 50. Find V_{CE} and mode of operation. A. 0.2V, Saturation B. 0.7V, Linear C. 0.2V, Linear D. 0.7V, Saturation	
16.	In the circuit shown R2 = 132 kΩ. Assume that the op-amp is ideal. Determine the value of R1 so that the closed-loop gain is 25. A. 15 kΩ B. 5.5 kΩ C. 100 kΩ D. 25 kΩ	
17.	The total resistance of the network given in figure is A. 2 Ω B. 2.6 Ω C. 3 Ω D. 3.2 Ω	
18.	The value of Thevenin's Voltage and Resistance is: A. 10Ω, 8V B. 5Ω, 4V C. 15Ω, 5V D. 55Ω, 15.5V	
19.	What is the ROC of the z-transform of the signal $x(n)= a^n u(n)+b^n u(-n-1)$? A. |a|<|z|<|b| B. |a|>|z|>|b| C. |a|>|z|<|b| D. |a|<|z|>|b|	
20.	If {x(n)} is the signal to be analyzed, limiting the duration of the sequence to L samples, in the interval $0 \le n \le L-1$, is equivalent to multiplying {x(n)} by: A. Kaiser window B. Hamming window C. Hanning window D. Rectangular window	

21.	The PDF of x is given by $f(x)=ke^{-ax}u(x)$, k is equal to A. 1/a B. a C. 2a D. a/2
22.	Evaluate $\int_{-\infty}^{\infty} e^{-at^2}\,\partial(t-10)dt$ A. 0 B. e^{-100a} C. $2e^{-100a}$ D. e^{-200a}
23.	If X deflection and Y deflection plates are connected to equal frequency and 90^{o} out of phase sinusoidal signal, the following pattern appears on a CRO screen A. Ellipse B. Straight line C. Circle D. Figure of Eight
24.	A 12 MHz clock frequency is applied to a cascaded counter containing a modulus-5 counter, a modulus-8 counter, and a modulus-10 counter. The lowest output frequency possible is A. 10 kHz B. 20 kHz C. 30 kHz D. 60 kHz
25.	A digital-to-analog converter with a full-scale output voltage of 3.5 V has a resolution close to 14m V. Its bit size is A. 4 B. 8 C. 16 D. 32
26.	The duty cycle of the most significant bit from a 4-bit (0–9) BCD counter is A. 20% B. 50% C. 10% D. 80%
27.	A system is defined by its impulse response $h(n) = 2^n u(n-2)$. The system is: A. Stable and causal B. Stable but not causal C. Unstable and non-causal D. Causal but not stable
28.	The 4-point discrete Fourier Transform (DFT) of a discrete time sequence $\{1, 0, 2, 3\}$ is A. $[0, -2+2j, 2, -2-2j]$ B. $[2, 2+2j, 6, 2-2j]$ C. $[6, 1-3j, 2, 1+3j]$ D. $[6, -1+3j, 0, -1-3j]$

29.	Calculate DFT of x (n) = {1, 0, 1, 0}. A. x (k) = {2, 0, 2, 0} B. x (k) = {1, 0, 1, 0} C. x (k) = {2, 0, 1, 0} D. none
30.	The open-loop DC gain of a unity negative feedback system with closed loop transfer function $\frac{s+4}{s^2+7s+13}$ is A. 4/13 B. 4/9 C. 4 D. 13
31.	The unit-step response of a system starting from rest is given by $c(t) = 1 - e^{-2t}$ for $t \geq 0$ The transfer function of the system is A. $\frac{1}{1+2s}$ B. $\frac{2}{2+s}$ C. $\frac{2}{2+s}$ D. $\frac{2}{1+2s}$
32.	A system described by the following differential equation $\frac{d^2y}{dt^2} + 3\frac{dy}{dt} + 2y = x(t)$ is initially at rest. For input $x(t) = 2u(t)$, the output y(t) is A. $(1 - 2e^{-t} + e^{-2t})u(t)$ B. $(1 + 2e^{-t} - 2e^{-2t})u(t)$ C. $(0.5 + e^{-t} + 1.5e^{-2t})u(t)$ D. $(0.5 + 2e^{-t} + 2e^{-2t})u(t)$
33.	Determine the stability of the system with characteristic equation: $2s^5 + 3s^4 + 2s^3 + s^2 + 2s + 2$ A. Stable, because system has two roots with negative real parts B. Partially Stable, because system has two equal roots C. Unstable, because system has two roots with negative real parts D. Cannot be determined with given information.
34.	During the fabrication of ICs, dry oxidation when compared to wet oxidation results in: A. Superior quality oxide with a higher growth rate B. Superior quality oxide with a lower growth rate C. Inferior quality oxide with a higher growth rate D. Inferior quality oxide with a lower growth rate

35.	The given program is being executed in an 8085 microprocessor. If the carry flag is initially not set, the contents of the accumulator after execution of the program is: A. 8CH B. 64H C. 23H D. 15H	MVI A, 07H; RLC; MOV B,A; RLC; RLC; ADD B; RRC;
36.	The size of the PROM in bits required for implementing a binary multiplier that multiplies two four-bit numbers is: A. 128 X 8 B. 256 X 8 C. 128 X 4 D. 256 X 4	
37.	The root locus plot for a system is given below. The open loop transfer function corresponding to this plot is given by A. $G(s)H(s) = k\frac{s(s+1)}{(s+2)(s+3)}$ B. $G(s)H(s) = k\frac{(s+1)}{s(s+2)(s+3)^2}$ C. $G(s)H(s) = k\frac{1}{s(s+1)(s+2)(s+3)}$ D. $G(s)H(s) = k\frac{(s+1)}{s(s+2)(s+3)}$	
38.	The steady-state error of a feedback control system with an acceleration input becomes finite in a A. type 0 system B. type 1 system C. type 2 system D. type 3 system	
39.	The return loss of a device is found to be 20dB. The Voltage Standing Wave Ratio(VSWR) and magnitude of reflection coefficient are 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	
40.	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_1 (t) and h_2 (t)	

ECE

Q. No.	Answer
1.	B
2.	D
3.	C
4.	A
5.	C
6.	B
7.	B
8.	A
9.	C
10.	B
11.	D
12.	A
13.	A
14.	C
15.	A
16.	B
17.	D
18.	A
19.	A
20.	D
21.	A
22.	B
23.	C
24.	C
25.	B
26.	A
27.	D
28.	D
29.	A
30.	B
31.	B
32.	A
33.	C
34.	B
35.	C
36.	B
37.	B
38.	C
39.	A
40.	C