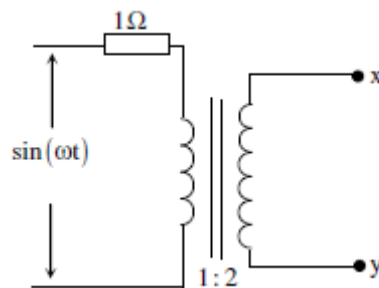


**PAPER – II**  
**ELECTRONICS**

**Note :** Attempt all the questions. Each question carries *two* (2) marks.

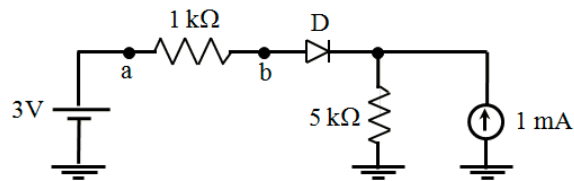
1. Current through a PN junction diode in reverse biased condition is due to
  - 1) minority carriers
  - 2) majority carriers
  - 3) both majority and minority carriers
  - 4) can't be determined
  
2. In CMOS technology, shallow P-well or N-well regions can be formed using
  - 1) low pressure chemical vapor deposition
  - 2) low energy sputtering
  - 3) low temperature dry oxidation
  - 4) low energy ion-implantation
  
3. When a JFET is cut-off, the depletion layers are
  - 1) far apart
  - 2) close together
  - 3) touching
  - 4) conducting
  
4. In bipolar transistors, dc current gain is
  - 1)  $\frac{I_C}{I_E}$
  - 2)  $\frac{I_C}{I_B}$
  - 3)  $\frac{I_E}{I_B}$
  - 4)  $\frac{I_E}{I_C}$

5. A MOS capacitor made using  $p$  type substrate is in the accumulation mode. The dominant charge in the channel is due to the presence of
- 1) holes
  - 2) electrons
  - 3) positively charged ions
  - 4) negatively charged ions
6. Norton's theorem states that a complex network connected to a load can be replaced with an equivalent impedance
- 1) in series with a current source
  - 2) in parallel with a voltage source
  - 3) in series with a voltage source
  - 4) in parallel with a current source
7. Assuming an ideal transformer. The Thevenin's equivalent voltage and impedance as seen from the terminals  $x$  and  $y$  for the circuit in figure are

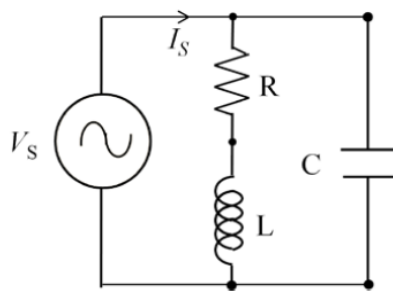


- 1)  $2 \sin(\omega t)$ ,  $4\Omega$
  - 2)  $1 \sin(\omega t)$ ,  $1\Omega$
  - 3)  $1 \sin(\omega t)$ ,  $2\Omega$
  - 4)  $2 \sin(\omega t)$ ,  $0.5\Omega$
8. If  $X(s)$ , the Laplace transform of signal  $x(t)$  is given by  $X(s) = \frac{(s+2)}{(s+1)(s+3)^2}$ , then the value of  $x(t)$  as  $t \rightarrow \infty$  is
- 1) 0
  - 2)  $\infty$
  - 3) 100
  - 4) can't be determined

9. The diode  $D$  used in the circuit below is ideal. The voltage drop  $V_{ab}$  across the  $1\text{k}\Omega$  resistor in volt is

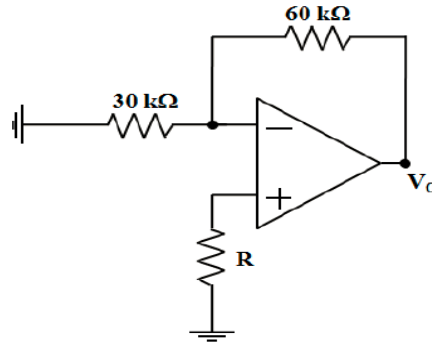


- 1) 0
  - 2) 2
  - 3) 3
  - 4) 5
10. In the circuit shown below,  $V_s = 101 \angle 0^\circ \text{ V}$ ,  $R = 10\Omega$  and  $\omega L = 100\Omega$ . The current  $I_s$  is in phase with  $V_s$ . The magnitude of  $I_s$  in milliamperes is



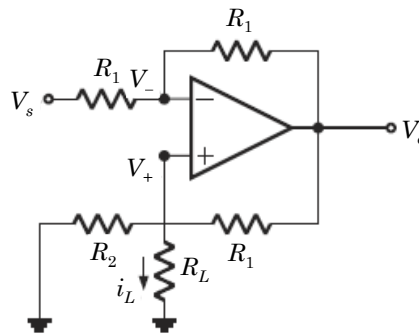
- 1) 1
  - 2) 10
  - 3) 100
  - 4) 1000
11. The parameter that indicates how fast the output of an op amp can vary for the input variations is
- 1) slew rate
  - 2) unity gain bandwidth
  - 3) open loop gain
  - 4) offset voltage

12. In the circuit given below, each input terminal of the opamp draws a bias current of 10 nA. The effect due to these input bias currents on the output voltage  $V_o$  will be zero, if the value of R chosen in kilo-ohm is



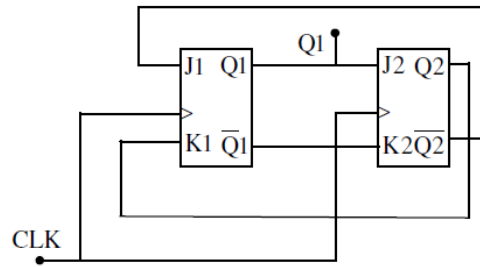
- 1) 20
- 2) 30
- 3) 60
- 4) 90

13. In the op amp circuit given below, the load current  $i_L$  is



- 1)  $-\frac{V_s}{R_2}$
  - 2)  $\frac{V_s}{R_2}$
  - 3)  $-\frac{V_s}{R_L}$
  - 4)  $\frac{V_s}{R_1}$
14. A low – pass filter with a cut-off frequency of 30 Hz is cascaded with a high-pass filter with a cut-off frequency of 20 Hz. The resultant system of filters will function as
- 1) an all-pass filter
  - 2) an all-stop filter
  - 3) an band stop (band-reject) filter
  - 4) a band-pass filter

15. The outputs of two flip-flops Q1, Q2 in the figure shown are initialized to 0, 0. The sequence generated at Q1 upon application of clock signal is



- 1) 01110.....
  - 2) 01010.....
  - 3) 00110.....
  - 4) 01100.....
16. The SOP (sum of products) form of a Boolean function is  $\Sigma(0,1,3,7,11)$ , where inputs are  $A, B, C, D$  ( $A$  is MSB, and  $D$  is LSB). The equivalent minimized expression of the function is
- 1)  $(\bar{B} + C)(\bar{A} + C)(\bar{A} + \bar{B})(\bar{C} + D)$
  - 2)  $(\bar{B} + C)(\bar{A} + C)(\bar{A} + \bar{C})(\bar{C} + D)$
  - 3)  $(\bar{B} + C)(\bar{A} + C)(\bar{A} + \bar{C})(\bar{C} + \bar{D})$
  - 4)  $(\bar{B} + C)(A + \bar{B})(\bar{A} + \bar{B})(\bar{C} + D)$
17. Which of the following types of ADC requires S/H?
- 1) Successive approximation type
  - 2) Integration type
  - 3) Flash
  - 4) Sigma-Delta
18. The present output  $Q_n$  of an edge triggered JK flip-flop is logic 0. If  $J = 1$ , then  $Q_{n+1}$
- 1) Cannot be determined
  - 2) Will be logic 0
  - 3) Will be logic 1
  - 4) Will rave around

19. In which 'T' state, the 8085 microprocessor sends address to memory or I/O and activate 'ALE' signal?
- 1) T1
  - 2) T2
  - 3) T3
  - 4) T4
20. How many bytes of bit addressable memory are present in 8051 based microcontrollers?
- 1) 8 bytes
  - 2) 16 bytes
  - 3) 32 bytes
  - 4) 64 bytes
21. In which of the following priority interrupt controller 8259A, the interrupt requests are registered?
- 1) ISR
  - 2) IRR
  - 3) IMR
  - 4) Priority resolver
22. How many I/O spaces on the I/O map are required for interfacing a DMA controller in an 8085 system?
- 1) 4
  - 2) 8
  - 3) 16
  - 4) 64
23. \_\_\_\_\_ is the process of using the same name for two or more functions.
- 1) Function Overloading
  - 2) Operator Overloading
  - 3) Default Function
  - 4) Constructors

24. What will be the output of the following code segment?

```
main() {  
char s[10];  
strcpy(s, "abc");  
printf("%d %d", strlen(s), sizeof(s));  
}
```

- 1) 3 10
- 2) 3 3
- 3) 10 3
- 4) 10 10

25. Set precision requires the \_\_\_\_\_ header file.

- 1) stdlib.h
- 2) iomanip.h
- 3) console.h
- 4) conio.h

26. A wave is incident normally on a good conductor. If the frequency of a plane electromagnetic wave increases four times, the skin depth, will

- 1) increase by a factor of 2
- 2) decrease by a factor of 4
- 3) remain the same
- 4) decrease by a factor of 2

27. Poynting vector gives

- 1) direction of polarization
- 2) rate of energy flow
- 3) intensity of electric field
- 4) intensity of magnetic field

- 28.** A magnetron is operated at a duty cycle of 0.001. It has a peak power output of 100 kilowatts. Its average power is
- 1) 10,000 watts
  - 2) 100 watts
  - 3) 1,000 watts
  - 4) 1,000,000 watts
- 29.** What is the carrier frequency in an AM wave when its highest frequency component is 850 Hz and the bandwidth of the signal is 50 Hz?
- 1) 80 Hz
  - 2) 695 Hz
  - 3) 625 Hz
  - 4) 825 Hz
- 30.** In statistical Time-Division Multiplexing (TDM), a block of data is usually many bytes while address is just
- 1) many bytes
  - 2) few bytes
  - 3) zero byte
  - 4) infinity bytes
- 31.** In an FM stereo multiplex transmission, the
- 1) sum signal modulates 19 kHz subcarrier
  - 2) difference signal modulates the 19 kHz subcarrier
  - 3) difference signal modulates the 38 kHz subcarrier
  - 4) difference signal modulates the 67 kHz subcarrier
- 32.** What type of fiber has the highest modal dispersion?
- 1) Step-index multimode
  - 2) Graded index multimode
  - 3) Step-index single mode
  - 4) Graded index mode

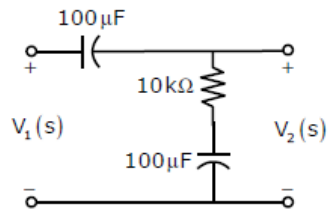


- 33.** What is the typical wavelength of light emitted from epitaxially grown LEDs?
- 1) 840 nm
  - 2) 490 nm
  - 3) 480 nm
  - 4) 940 nm
- 34.** Chromatic dispersion can be eliminated by
- 1) using a monochromatic light source
  - 2) using a very small numerical aperture fiber
  - 3) using a graded-index fiber
  - 4) using a very sensitive photo detector
- 35.** In a regulated power supply, two similar 15 V Zeners are connected in series. The input voltage is 45 V DC. If each Zener has a maximum current rating of 300 mA, what should be the value of the series resistance?
- 1) 10  $\Omega$
  - 2) 20  $\Omega$
  - 3) 40  $\Omega$
  - 4) 50  $\Omega$
- 36.** Which one of the following regulators has the highest efficiency?
- 1) Shunt regulator
  - 2) Series regulator
  - 3) Switching regulator
  - 4) DC-DC converter
- 37.** The slip of an induction motor normally does not depend on
- 1) rotor speed
  - 2) synchronous speed
  - 3) shaft torque
  - 4) core-loss component

38. The typical ratio of latching current to holding current in a 20A thyristor is
- 1) 5.0
  - 2) 2.0
  - 3) 1.0
  - 4) 0.5
39. In a step-down chopper using pulse-width modulation with  $T_{ON} = 3 \times 10^{-3}$  s and  $T_{OFF} = 3 \times 10^{-3}$  s periods. The chopping frequency in Hz is
- 1) 333.33
  - 2) 250
  - 3) 500
  - 4) 1000
40. Which one of the following instruments is an integrating instrument?
- 1) ammeter
  - 2) voltmeter
  - 3) wattmeter
  - 4) watt-hour meter
41. For signal conditioning of a piezoelectric type transducer we require
- 1) a charge amplifier
  - 2) a differential amplifier
  - 3) an instrumentation amplifier
  - 4) a transconductance amplifier



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



- 1)  $\frac{0.5s + 1}{s + 1}$                       2)  $\frac{3s + 6}{s + 2}$
- 3)  $\frac{s + 2}{s + 1}$                          4)  $\frac{s + 1}{s + 2}$
48. For a stable system
- 1) gain margin must be positive but phase margin can be positive or negative
  - 2) phase margin must be positive but gain margin can be positive or negative
  - 3) both gain margin and phase margin must be positive
  - 4) one of them must be zero

49. In a type-1 second order system, the first undershoot occurs at a time

- 1)  $t_p = \frac{\pi}{\omega_d}$
- 2)  $t_p = \frac{2\pi}{\omega_d}$
- 3)  $t_p = \frac{\pi}{2\omega_d}$
- 4)  $t_p = \frac{\omega_d}{2\pi}$

50. Due to an increase in the forward path gain of a control system, the maximum overshoot is
- 1) reduced
  - 2) increased
  - 3) not affected
  - 4) eliminated

## ROUGH WORK

## ROUGH WORK