THOMAS FLOYD

1. A silicon diode is in series with 1.0 kΩ resistor and a 5 V battery. If the anode is connected to the positive battery terminal, the cathode voltage with respect to the negative battery terminal is
A. 0.7 V
B. 5.7 V
C. 0.3 V
D. **4.3 V**

2. The average value of a half-wave rectified voltage with a peak value of 200 V is
A. 127.3 V
B. 141 V
C. 0 V
D. **63.7 V**

3. The peak value of the input to a half-wave rectifier is 10 V. The approximate peak value of the output is
A. 10.7 V
B. **9.3 V**
C. 10 V
D. 3.18 V

4. For the circuit in Question in Question 3, the diode must be able to withstand a reverse voltage of
A. 5 V
B. **10 V**
C. 20 V
D. 3.18 V

5. The average value of a full-wave rectified voltage with a peak value of 75 V is
A. 37.5 V
B. 23.9 V
C. 53 V
D. **47.8 V**

6. When the peak output voltage is 100 V, the PIV for each diode in a center-tapped full-wave rectifier is (neglecting the diode drop)
A. 100 V
B. 141 V
C. **200 V**
D. 50 V

7. When the rms output voltage of a bridge full wave rectifier is 20 V, the peak inverse voltage across the diodes is (neglecting the diode drop)
A. **28.3 V**
B. 20 V
C. 40 V
D. 56.6 V

8. A certain power supply filter produces an output with a ripple of 100 mV peak-to-peak and a dc value of 20 V. The ripple factor is
A. **0.005**
B. 0.05
C. 0.02
D. 0.00005

9. A 60 V peak full-wave rectified voltage is applied to a capacitor-input filter. If f = 120 Hz. R_L = 10 k Ω and C = 10 μF, the ripple voltage is
A. 0.6 V
B. **5.0 V**
C. 6 mV
D. 2.88 V

10. If the input voltage to a voltage tripler has an rms value of 12 V, the dc output voltage is approximately
A. 36 V
B. 33.9 V
C. 32.4 V
D. **50.9 V**

11. For a certain 12 V zener diode, a 10 mA change in zener current produces a 0.1 V change in zener voltage. The zener impedance for this current ranges is
A. 0.1 Ω
B. 100 Ω
C. **10 Ω**
D. 1 Ω

12. The data sheet for a particular zener gives V_Z = 10 V at I_{ZT} = 500 mA. Z_Z for these conditions is
A. **20 Ω**
B. 50 Ω
C. 10 Ω
D. unknown

13. If the output of a transistor amplifier is 5 V rms and the input is 100 mV rms, the voltage gain is
A. **50**
B. 500
C. 5
D. 100

14. In a certain voltage-divider biased npn transistor, V_B is 2.95 V. The dc emitter voltage is approximately
A. 2.95 V
B. **2.25 V**
C. 0.7 V
D. 3.65 V

15. In an emitter bias circuit, R_E = 2.7 k Ω and V_{EE} = 15 V. The emitter current
A. is 180 mA
B. is 2.7 mA
C. **is 5.3 mA**

D. cannot be determined

16. If the dc emitter current in a certain transistor amplifier is 3 mA, the approximate value of r'_e is
A. 3 Ω
B. 3 kΩ
C. 0.33 kΩ
D. **8.33 Ω**

17. For a common-collector amplifier, R_E = 100 Ω, r'_e = 10 Ω, and β_{AC} = 150. The ac input resistance at the base is
A. **16.5 Ω**
B. 15 kΩ
C. 110 Ω
D. 1500 Ω

18. If a 10 mV signal is applied to the base of the emitter-follower circuit in Question 5, the output signal is approximately
A. 1.5 mV
B. **10 mV**
C. 100 mV
D. 150 mV

19. For a common-emitter amplifier, R_C = 1.0 kΩ, R_E = 390 Ω, and β_{ac} = 75. Assuming the R_E is completely bypassed at the operating frequency, the voltage gain is
A. 2.56
B. **66.7**
C. 2.47
D. 75

20. In the circuit of Question 7, if the frequency is reduced to the point where $X_{C(bypass)} = R_E$, the voltage gain
A. remains the same
B. **is less**
C. is greater

21. In a darlington pair configuration, each transistor has an ac beta of 125. If R_E is 560 Ω, the input resistance is
A. 560 Ω
B. 70 Ω
C. 140 kΩ
D. **8.75 MΩ**

22. In a common-emitter amplifier with voltage-divider bias, $R_{in(base)}$ = 68 kΩ, R_1 = 33 kΩ, and R_2 = 15 kΩ. The total input resistance is
A. 22.2 kΩ
B. 68 kΩ
C. **8.95 kΩ**
D. 12.3 kΩ

23. A CE amplifier is driving a 10 kΩ load. If R_C = 2.2 kΩ and r'_e = 10 Ω, the voltage gain is approximately
A. **180**
B. 220
C. 10
D. 1000

24. The overall gain found in Question 14 can be expressed in decibels as
A. 47.0 dB
B. 35.6 dB
C. **94.1 dB**
D. 69.8 dB

25. In a certain FET circuit, V_{GS} = 0 V, V_{DD} = 15 V, I_{DSS} = 15 mA, and R_D = 470 Ω. If R_D is decreased to 330 Ω, I_{DSS} is
A. 1 mA
B. 10.5 mA
C. 19.5 mA
D. **15 mA**

26. For a certain JFET, I_{GSS} = 10 nA at V_{GS} = 10 V. The input resistance is
A. 1 MΩ
B. **1000 MΩ**
C. 100 MΩ
D. 1000 mΩ

27. For a certain p-channel JFET, $V_{GS(off)}$ = 8 V. The value of V_{GS} for an approximately midpoint bias is
A. **2.34 V**
B. 0 V
C. 4 V
D. 1.25 V

28. In a certain common-source (CS) amplifier, V_{DS} = 3.2 V rms and V_{GS} = 280 mV rms. The voltage gain is
A. 1
B. **11.4**
C. 8.75
D. 3.2

29. In a certain CS amplifier, R_D = 1.0 kΩ, R_S = 560 Ω, V_{DD} = 10 V, and g_m = 4500 µS. If the source resistor is completely bypassed, the voltage gain is
A. 450
B. 45
C. **4.5**
D. 2.52

30. A CS amplifier has a load resistance of 10 kΩ and R_D = 820 Ω, If g_m = 5 mS and V_{in} = 500 mV, the output signal voltage is
A. **1.89 V**
B. 2.05 V
C. 25 V
D. 0.5 V

31. If the load resistance in Question 7 is removed, the output voltage will
A. stay the same
B. decrease
C. **increase**
D. be zero

32. A certain common-drain (CD) amplifier with R_S = 1.0 kΩ has a transconductance of 6000 µS. The voltage gain is
A. 1
B. **0.86**
C. 0.98
D. 6

33. The data sheet for the transistor used in a CD amplifier specifies I_{GSS} = 5 nA at V_{GS} = 10 V. If the resistor from ate to ground, R_G, is 50 MΩ, the total input resistance is approximately.
A. 50 MΩ
B. 200 MΩ
C. 40 MΩ
D. 20.5 MΩ

34. Two FET amplifier are cascaded. The first stage has a voltage gain of 5 and the second stage has a voltage gain of 7. The overall voltage gain is
A. **35**
B. 12
C. dependent on the second stage loading
35. A certain class A power amplifier delivers 5 W to a load with an input signal power of 100 mW. The power gain is
A. 100
B. **50**
C. 250
D. 5
36. A certain class A power amplifier has V_{CEQ} = 12 V and I_{CQ} = 1 A. The maximum signal power output is
A. 6 W
B. 12 W
C. 1 W
D. 0.707 W
37. The output of a certain two-supply class B push pull amplifier has a V_{CC} of 20 V. If the load resistance is 50 Ω, the value of $I_{C(sat)}$ is
A. 5 mA
B. **0.4 A**
C. 4 mA
D. 40 mA

38. The gain of a certain amplifier decrease by 6 dB when the frequency is reduced from 1 kHz to 10 Hz. The roll-off is
A. - 3 dB/decade
B. - 6 dB/decade
C. - 3 dB/octave
D. **- 6 dB/octave**

39. The gain of a particular amplifier at a given frequency decreases by 6 dB when the frequency is doubled. The roll-off is
A. - 12 dB/decade
B. - 20 dB/decade
C. - 6 dB/octave
D. **answer b and c**
40. An amplifier has the following critical frequencies: 1.2 kHz, 950 Hz, 8 kHz, and 8.5 kHz. The bandwidth is
A. 7550 Hz
B. 7300 Hz
C. **6800 Hz**
D. 7050 Hz
41. If the f_r of the transistor used in a certain amplifier is 75 MHz and the bandwidth is 10 MHz, the voltage gain must be
A. 750
B. **7.5**
C. 10
D. 1

42. In the midrange of an amplifier's bandwidth, the peak output voltage is 6 V. At the lower critical frequency, the peak output voltage is
A. 3 V
B. 3.82 V
C. 8.48 V
D. **4.24 V**

43. At the upper critical frequency, the peak output voltage of a certain amplifier is 10 V. The peak voltage in the midrange of the amplifier is
A. 7.07 V
B. 6.37 V
C. **14.14 V**
D. 10 V
44. If $A_{v(d)}$ = 3500 and A_{cm} = 0.35, the CMRR is
A. 1225
B. 10,000
C. 80 dB
D. **answers b and c**
45. A certain op-amp has a bias current of 50µA and 49.3µA. The input offset current is
A. 700 nA

B. **99.3µA**
C. 49.7µA
D. none of these

46. The output of a particular op-amp increases 8 V in 12 µs. The slew rate is
A. 96 V/µs
B. 0.67 V/ µs
C. **1.5 V/µs**
D. none of the above
47. A certain inverting amplifier has an R_i of 0.1 kΩ and an R_f of 100 kΩ. The closed loop gain is
A. 100,000
B. 1000
C. **101**
D. 100

48. If the feedback resistor in Question 17 is open, the voltage gain is
A. **increases**
B. decreases
C. is not affected
D. depends on R_i

49. A certain inverting amplifier has a closed-loop gain of 25. The op-amp has an open-loop gain of 100,000. if another op-amp with an open loop gain of 200,000 is substituted in the configuration, the closed-loop gain
A. doubles
B. drops to 12.5
C. **remains at 25**
D. increases slightly
50. If a certain op-amp has a midrange open-loop gain of 200,000 and a unity gain frequency of 5 MHz, the gain-bandwidth product is
A. 200,000 Hz
B. $1 \times 10_{12}$ Hz
C. **5,000,000 Hz**
D. not determinable from the information

51. If a certain op-amp has a closed-loop gain of 20 and an upper critical frequency of 10 MHz, the gain-bandwidth product is
A. 200 MHz
B. 10 MHz
C. the unity-gain frequency
D. **answer a and c**
52. In a certain oscillator, $A_V = 50$. The attenuation of the feedback circuit must be
A. 1
B. 0.01
C. 10
D. **0.02**