* Multiple Choice Question *

1 An ideal operational amplifier has
a. infinite output impedance b. zero input impedance c. infinite bandwidth d. All of the above

2 Another name for a unity gain amplifier is:
a. difference amplifier b. comparator c. single ended d. voltage follower

3 The open-loop voltage gain (A_{ol}) of an op-amp is the
a. external voltage gain the device is capable of b. internal voltage gain the device is capable of c. most controlled parameter d. same as A_{cl}

4 A noninverting closed-loop op-amp circuit generally has a gain factor:
a. less than one b. greater than one c. of zero d. equal to one

5 In order for an output to swing above and below a zero reference, the op-amp circuit requires:
a. a resistive feedback network b. zero offset c. a wide bandwidth d. a negative and positive supply.

6 Op-amps used as high- and low-pass filter circuits employ which configuration?
a. noninverting b. inverting c. open-loop d. both (a) and (b)

7 The common-mode gain is
a. very high b. very low c. always unity d. unpredictable

8 The differential gain is
a. very high b. very low c. dependent on input voltage d. about 100

9 If ADM = 3500 and ACM = 0.35, the CMRR is
a. 1225 b. 10,000 c. 80 dB d. Both (1) and (3)

10 With zero volts on both inputs, an OP-amp ideally should have an output
a. equal to the positive supply voltage b. equal to the negative supply voltage c. equal to zero d. equal to CMRR

11 Of the values listed, the most realistic value for open-loop voltage gain of an OP-amp is
a. 1 b. 2000 c. 80dB d. 100000

12 The output of a particular Op-amp increases 8V in 12μs. The slew rate is

a. 90 V/μs b. 0.67 V/μs c. 1.5 V/μs d. none of these

13 A certain non inverting amplifier has Ri of 1 kΩ and Rf of 100 kΩ. The closed-loop voltage gain is

a. 100,000 b. 1000 c. 101 d. 100

14 Negative feedback

a. increases the input and output impedances b. increases the input impedance and bandwidth c. decreases the output impedance and bandwidth d. does not affect impedance or bandwidth

15 The use of negative feedback .....

a. reduces the voltage gain of an Op-amp b. makes the Op-amp oscillate c. makes linear operation possible d. Both (1) and (2)

16 For an Op-amp with negative feedback, the output is

a. equal to the input b. increased c. fed back to the inverting input d. fed back to the noninverting input

17 The Op-amp can amplify

a. AC signals only b. DC signals only c. both signals d. neither any signals

18 The ratio between differential gain and common-mode gain is called:

a. common-mode rejection b. amplitude c. differential-mode rejection d. phase

19 Ideal value of Input resistance Ri is

a. 0 b. ∞ c. Low d. high

20 Ideal value of Input resistance Ri is

a. 0 b. ∞ c. Low d. High

21 Ideal & Practical value of CMRR is

a. ∞, 90dB b. 0, 90 dB c. ∞ ,120 dB d. 0 , 120 dB

22 Practical value of PSRR is

a. 100 μV/V b. 150 μV/V c. 190 μV/V d. None of above

23 Ideal value of PSRR is

a. 0 b. ∞ c. Low d. High

24 Slew rate unit is

a. μV/V b. V/μS c. both Λ and B d. none of the above

25 Ideal value of Slew rate is

a. 0 b. ∞ c. High d. Low

26 Ideal value of Bandwidth is

a. 0 b. ∞ c. Low d. none of them.

27 A portion of the output that provides circuit stabilization is considered to be:

a. negative feedback b. distortion c. open-loop d. positive feedback

28 The closed-loop voltage gain of an inverting amplifier equals:

a. the ratio of the input resistance to the feedback resistance b. the open-loop voltage gain c. the feedback resistance divided by the input resistance d. the input resistance

29 The major difference between ground and virtual ground is that virtual ground is only a:

a. voltage reference b. current reference c. power reference d. difference reference

30 An output that is proportional to the addition of two or more inputs is from which type of amplifier?

a. differentiator b. difference c. summing d. analog subtractor

31 An ideal amplifier should have:

a. high input current b. zero offset c. high output impedance d. moderate gain

32 A circuit that uses an amplifier with passive filter elements is called a(n):

a. relaxation oscillator b. signal generator c. differential amplifier d. active filter

33 The input offset current equals the

a. average of two base currents b. collector current divided by the current gain c. difference between two base-emitter voltages d. difference between two base currents

34 How many op-amps are required to implement this equation? Vo = V1

a. 2 b. 3 c. 4 d. 1

35 Calculate the cutoff frequencies of a bandpass filter with R1 = R2 = 5 k and C1 = C2 = 0.1 F.

a. fOL = 318.3 Hz, fOH = 318.3 Hz *b. fOL = 636.6 Hz, fOH = 636.6 Hz* *c. fOL = 318.3 Hz, fOH = 636.6 Hz* *d. fOL = 636.6 Hz, fOH = 318.3 Hz*

36 Calculate the cutoff frequency of a first-order low-pass filter for R= 2.5 k and C = 0.05 F.
a. 1.273 kHz b. 12.73 kHz c. 127.3 kHz d. 127.30 Hz

37 A filter that provides a constant output from dc up to a cutoff frequency and passes no signal above that frequency is called which filter.?
a. low-pass b. high-pass c. bandpass d. bandstop

38 An example of an instrumentation circuit is
a. dc voltmeter b. display driver c. ac voltmeter d. All of the above

39 Gain of operational amplifier is
a. independent of internal structure b. dependent of internal structure c. depend upon two external resistances d. both b and c

40 In op-amp signal applied at inverting terminal appears at output terminal with a phase
a. 0 b. 9 c. 180 d. 45

41 With negative feedback, the returning signal:
a. aids the input signal b. is proportional to output current c. opposes the input signal d. is proportional to differential voltage gain

42 A circuit whose output is proportional to the difference between the input signals is considered to be which type of amplifier?
a. common-mode b. darlington c. differential d. operational

43 The voltage follower has a:
a. closed-loop voltage gain of unity b. small open-loop voltage gain c. closed-loop bandwidth of zero d. large closed-loop output impedance

44 The ratio between differential gain and common-mode gain is called:
a. amplitude b. differential-mode rejection c. common-mode rejection d. phase

45 Op-amp is a
a. Voltage-controlled voltage source (VCVS) b. Voltage-controlled current source (VCCS) c. Current-controlled voltage source (CCVS) d. Current-controlled current source (CCCS)

46 Voltage gain of an ideal op-amp is:
a. Infinite b. Very high c. Low d. Very low

47 If ground is applied to the (+) terminal of an inverting op-amp, the (–) terminal will:

a. not need an input resistor | b. be virtual ground | c. have high reverse current | d. not invert the signal

48 In an open-loop op-amp circuit, whenever the inverting input (–) is negative relative to the noninverting input (+), the output will:

a. swing negative | b. swing positive | c. close the loop | d. be balanced

49 The input stage of an Op-amp is usually a

a. differential amplifier | b. class B push-pull amplifier | c. CE amplifier | d. swamped amplifier

50 The input offset current equals the

a. difference between two base currents | b. average of two base currents | c. collector current divided by current gain | d. none of these

Answers:

1 (c)	2 (d)	3(b)	4(b)	5(d)	6(d)	7(b)	8(a)	9(d)	10(c)
11(d)	12(b)	13()	14(b)	15(d)	16(c)	17(c)	18(a)	19(b)	20(a)
21(a)	22(b)	23(a)	24(b)	25(b)	26(b)	27(a)	28(c)	29(a)	30(c)
31 (b)	32 (d)	33(d)	34(d)	35(a)	36(a)	37(a)	38(d)	39(d)	40(c)
41(c)	42(c)	43(a)	44(c)	45 (a)	46(a)	47(b)	48(a)	49(a)	50(a)