

*BEST BMET  
CBET STUDY GUIDE  
MODULE III*



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BIOMEDICAL ENGINEERING SOCIETY OF TEXAS (BEST)  
CERTIFIED BIOMEDICAL EQUIPMENT TECHNICIAN (CBET)  
STUDY GUIDE  
MODULE III

1. What are the three types of circuit elements used for passive transducers?
  - a. Photovoltaic, photoemissive, and photoconductive
  - b. Resistive, inductive, and capacitive
  - c. Thermocouple, thermistor, and solid-state
  - d. Transistor, vacuum tube, and operational amplifier
  
2. What are two types of strain gauge transducers?
  - a. Bonded and unbonded
  - b. Inductive and capacitive
  - c. Active and passive
  - d. Biopotential and biochemical
  
3. The electrode process of free ions migrating from the metal to the skin, and free ions migrating from the skin to the metal is called:
  - a. Dissociation
  - b. Halfcell potential
  - c. Polarization
  - d. Ion Balance
  
4. An amplifier has a change of 10 mV at the differential input which causes a change of 10 V at the output. The common-mode voltage changes of 10 mV causes an output voltage change of 1 mV. What is the common-mode rejection ratio (CMRR) of this amplifier?
  - a. 80 dB
  - b. 86 dB
  - c. 40 dB
  - d. 10 dB

5. The advantage of the LVDT detector circuit is that it enables one to determine both the \_\_\_\_ and the \_\_\_\_:

- a. Direction, position
- b. Amplitude, XL
- c. Frequency, polarity
- d. RMS, DC values

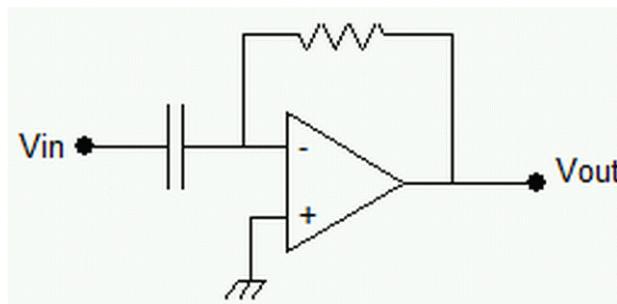
6. For an amplifier having a voltage gain of 60 and an output impedance of 4.0 kilohms driving a load of 8.0 kilohms, the output voltage for an input signal of 100 millivolts is

- a. 8.0 volts
- b. 6.0 volts
- c. 4.0 volts
- d. 2.4 volts
- e. 0.6 volts

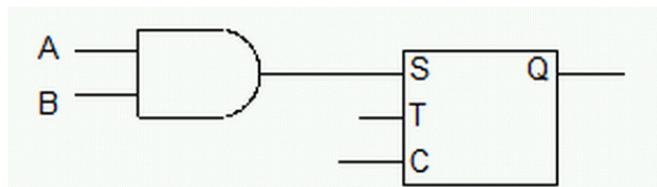
7. A microprocessor program object listing is

- a. a list of one-byte numbers
- b. a list of memory addresses
- c. a list of mnemonics
- d. a list of one-byte instructions

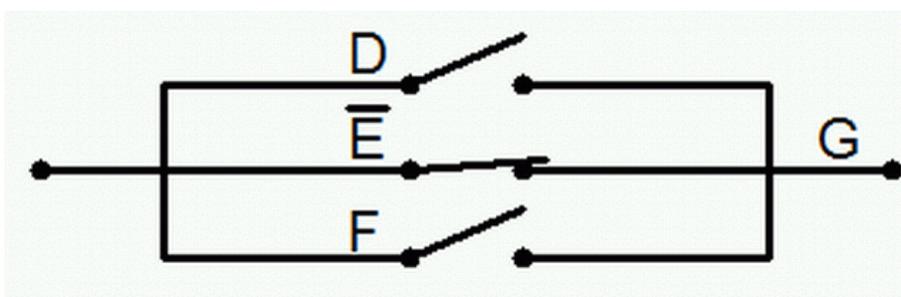
8. Refer to the pages of drawings and schematics; see Drawing 18. The circuit shown is
- a. an RC integrating circuit
  - b. a differentiating circuit
  - c. a resonant circuit
  - d. a low-pass filter circuit



9. Refer to the pages of drawings and schematics; see Drawing 5. The output at Q of the circuit shown below is always a logic 1. The problem could be
- a. C is always zero
  - b. T is missing
  - c. lead A and lead B both are zero
  - d. both choices a and b above



10. A microprocessor-based system is
- bus oriented
  - versatile
  - controlled by software and hardware
  - controlled by hardware
12. In the power formula  $P = EI\cos\theta$  for an AC circuit, if  $\theta$  varies from 0 to 90 degrees,  $\cos\theta$  varies from
- 1 to infinity
  - 0 to infinity
  - 1 to 0
  - 0 to negative infinity
13. It is desirable to optimize logic circuits to reduce
- cost and size
  - power consumption and cooling requirements
  - weight and to improve reliability
  - all of the above
14. Refer to the pages of drawings and schematics; see Drawing 12. The logical expression describing the relay circuit below is



- $D + E + F$
- $D + E + \overline{F}$
- $\overline{E}F$
- $D \cdot \overline{E} + F$

15. The output of a voltage comparator with +2.5 V on inverting input and +2.7 V on non-inverting input will be:
- +V sat
  - V sat
  - +0.2 V
  - 0.2 V
16. A non-inverting voltage follower has an input voltage of +5.5 Vp-p. Its output will be about:
- 0 V
  - +V sat
  - V sat
  - +5.5 Vp-p
17. A pull-up resistor is required for
- high level logic circuits
  - low level logic circuits
  - open collector logic circuits
  - measuring the current from a voltage sources
18. The function of a microprocessor's ALU is to
- perform data movements
  - act as an output for the accumulator
  - logically or arithmetically modify data
  - provide timing control to status register
19. Which is not an advantage of negative feedback in a op-amp circuit
- stability
  - increased input resistance
  - higher gain
  - decreased output resistance

20. Except when it is fetching an instruction, the program counter points to the ... program instruction
- a. last
  - b. next
  - c. current
  - d. subroutine
21. A low-pass filter can be used as
- a. a comparator circuit
  - b. integrator circuit
  - c. summer circuit
  - d. differentiator circuit
22. A simple method of increasing output current when it exceeds the capabilities of the op amp is
- a. current source
  - b. current booster
  - c. current sink
  - d. current inverter