



## BRAINWARE UNIVERSITY

Term End Examination 2021 - 22

Programme – Bachelor of Technology in Electronics & Communication Engineering

Course Name – Analog Circuits

Course Code - PCC-EC402

( Semester IV )

Time allotted : 1 Hrs.15 Min.

Full Marks : 60

[The figure in the margin indicates full marks.]

### Group-A

(Multiple Choice Type Question)

1 x 60=60

Choose the correct alternative from the following :

- (1) Which of the following is not true in the circuit for digital-to- analog voltage converter?
  - a) Some logic circuitry
  - b) A resistor network
  - c) A reference voltage
  - d) A resonant circuit
- (2) Which one of the following D/A converters has the resolution of approximately 0.4% of its full scale range?
  - a) 8-bit
  - b) 10-bit
  - c) 12bit
  - d) 16bit
- (3) Cascade amplifiers are used for
  - a) Voltage amplification
  - b) Video amplifiers
  - c) Power amplifier
  - d) Tuned amplifier
- (4) Stability can be improved in an op-amp by
  - a) Pole zero compensation
  - b) Dominant pole compensation
  - c) Leads compensation
  - d) All of these
- (5) The voltage follower is commonly used as
  - a) Switch
  - b) Isolator
  - c) Regulator
  - d) None of these
- (6) Which of the following are the non-linear applications of OP-AMP?
  - a) Current-to-voltage converter
  - b) Comparator
  - c) Peak detector
  - d) Limiter
- (7) The main function of a voltage regulator is to provide a nearly..... output voltage.
  - a) Sinusoidal
  - b) Constant
  - c) Smooth
  - d) Fluctuating
- (8) Thermal shutdown occurs in an IC regulator if
  - a) Power dissipation is too low
  - b) Internal temperature is too high
  - c) Current through the device is too low
  - d) Any of these occurs
- (9) R-C coupling is proper in low-level AF amplifier because it

- a) Is inexpensive and needs no adjustment  
c) Needs low voltage battery
- (10) An OPAMP has  
a) Equal input and output resistance  
c) Large input resistance and low output resistance
- (11) The open loop voltage gain of an OPAMP is  
a) Small  
c) Can be anything
- (12) Which of the following are true about capacitor filter?  
a) It is also called as capacitor output filter  
c) It is connected in parallel to load
- (13) The inductor is placed in the L section filter because \_\_\_\_\_  
a) It offers zero resistance to DC component  
c) It bypasses the DC component
- (14) The output waveform of CLC filter is superimposed by a waveform referred to as \_\_\_\_\_  
a) Square wave  
c) Saw tooth wave
- (15) A common mode signal is applied to  
a) The non-inverting input  
c) Top of tail resistor
- (16) Phase shift oscillator has the following advantage  
a) It does not contain transformer or inductor  
c) It can produce low frequency
- (17) Wein bridge oscillator has the following disadvantage  
a) It can generate frequency up to 1 MHz only  
c) Output is constant
- (18) An Wein bridge oscillator uses  
a) Positive feedback  
c) Both types of feedback
- (19) We use crystal oscillator because  
a) It gives high output voltage  
c) Frequency of oscillation remains substantially constant
- (20) Which topology of feedback amplifier has very high input and output impedances?  
a) Voltage series feedback  
c) Current series feedback
- (21) Voltage shunt feedback amplifier is a  
a) Transconductance amplifier  
c) Voltage amplifier
- (22) For a base current of  $10 \mu\text{A}$ , what is the value of collector current in common emitter if  $\beta_{dc} = 100$   
a)  $10 \mu\text{A}$   
c) 1 mA
- b) Has better low frequency response  
d) Provides an output signal in phase with input signal
- b) Low input resistance and a large output resistance  
d) None of these
- b) Large  
d) Unity
- b) It is electrolytic  
d) It helps in storing the magnetic energy
- b) It offers infinite resistance to DC component  
d) It bypasses the AC component
- b) Triangular wave  
d) Sine wave
- b) The inverting input  
d) Both inputs
- b) It provides good frequency stability  
d) It provides very small feedback
- b) It requires large number of components  
d) There is a loading effect
- b) Negative feedback  
d) An LC tank circuit
- b) It works at high frequency  
d) It requires very low dc supply voltage
- b) Voltage shunt feedback  
d) Current shunt feedback
- b) Transresistive amplifier  
d) Current amplifier
- b)  $100 \mu\text{A}$   
d) 10 mA
- (23)

A BJT with forward current transfer ratio  $\alpha = 0.98$ , when working in CE mode, provides current transfer ratio  $\beta$  as

- a) 98  
c) 49
- b) 0.02  
d) 0.49

(24) Which one of the following is correct?

- a)  $h_{fe} = \alpha$   
c)  $h_{fe} = -\alpha$
- b)  $h_{fe} = \beta$   
d)  $h_{fe} = -\beta$

(25) The slew rate for output voltage  $V_o = 2 \sin \omega t$ , of an op-amp is

- a)  $\omega$   
c)  $1/\omega$
- b)  $2\omega$   
d)  $2/\omega$

(26) Common-emitter amplifier circuit with emitter feedback, the input impedance is nearly equal to

- a)  $h_{fe}$   
c)  $h_{fe}/R_E$
- b)  $R_E$   
d)  $h_{fe}R_E$

(27) The voltage gain of single-stage CE amplifier increases with

- a) Increase in ac load resistance  
c) Increase in source resistance
- b) Decrease in ac load resistance  
d) Increase  $r_e$

(28) The frequency of oscillation of a Hartley oscillator is

- a)  $f = 1/2\pi(L_{eq}C)^{1/2}$   
c)  $f = 1/2\pi RC\sqrt{10}$
- b)  $f = 1/2\pi(LC_{eq})^{1/2}$   
d)  $f = 1/2\pi RC$

(29)

A  $100\mu\text{F}$  capacitor when used as a filter has 15V ac across it with a load resistor of  $2.5\text{K}\Omega$ . If the filter is the full wave and supply frequency is 50Hz, what is the percentage of ripple frequency in the output?

- a) 2.456%  
c) 3.785%
- b) 1.154%  
d) 3.675%

(30)

A single phase full wave rectifier makes use of pi section filter with  $10\mu\text{F}$  capacitors and a choke of 10henry. The secondary voltage is 280V and the load current is 100mA. Determine the dc output voltage when  $f=50\text{Hz}$ .

- a) 345V  
c) 243V
- b) 521V  
d) 346V

(31) Barkhausen Criterion for oscillator stability is

- a)  $A\beta = 0$   
c)  $A/\beta = 1$
- b)  $A\beta = \pm 1$   
d)  $A = 1/\sqrt{\beta}$

(32) The transfer characteristic of a transconductance amplifier is

- a)  $g_m = I_0/V_s$
- b)  $A_i = I_0/I_s$



- (47) An instrumentation amplifier uses
- a) 1 op-amp
  - b) 2 op-amp
  - c) 4 op-amp
  - d) 3 op-amp
- (48) The zero level detector is one application of a
- a) Differentiator
  - b) Integrator
  - c) Summing amplifier
  - d) Comparator.
- (49) The current gain of a common-base amplifier is
- a) Less than unity
  - b) Greater than unity
  - c) Unity
  - d) Zero
- (50) The voltage gain of single-stage CE amplifier depends on
- a)  $r_L/r_e$
  - b)  $r_e/r_L$
  - c)  $r_e r_L$
  - d) None of these
- (51) The gain of a BJT drops at high frequencies due to
- a) Coupling and bypass capacitor
  - b) Inter-electrode transistor capacitances
  - c) Coupling and bypass capacitor and inter-electrode transistor capacitances
  - d) Early effect
- (52) Which transistor bias circuit provides good Q-point stability with a single-polarity supply voltage?
- a) Base bias
  - b) Collector-feedback bias
  - c) Voltage-divider bias
  - d) None of these
- (53) Which of the following oscillators is used for generating low frequencies?
- a) RC phase shift oscillator
  - b) LC oscillator
  - c) Wien-bridge oscillator
  - d) Blocking oscillator
- (54) Which of the following statements is true of phase-shift type and Wien-bridge-type RC oscillator?
- a) Both use positive feedback.
  - b) The phase-shift type oscillator uses positive feedback only whereas Wien-bridge oscillator uses both positive and negative feedback.
  - c) The phase-shift-type oscillator uses both positive and negative feedback whereas the Wien-bridge oscillator uses positive feedback only
  - d) Both use negative feedback
- (55) The % load regulation of a power supply providing 100V unloaded & 95V at full load is
- a) 5.3%
  - b) 5.0%
  - c) 0.53%
  - d) None of the above
- (56) Which of the following voltage regulator is preferred for providing large value of load current?
- a) Zener diode shunt regulator
  - b) Transistor series voltage regulator
  - c) Transistor shunt voltage regulator
  - d) None of the above
- (57) A transistor series voltage regulator is called emitter follower regulator because the emitter of the pass transistor follows the .....voltage.
- a) Output
  - b) Input
  - c) Base
  - d) Collector
- (58) If the output of voltage regulator varies from 20 to 19.8V when the line voltage varies over its specified range 0.2 V, the line regulation is .....
- a) 0
  - b) 1%
  - c) 2%
  - d) 5%
- (59) Compared to the ripple into a voltage regulator, the ripple out of a voltage regulator is .....
- a) Equal in value
  - b) Much larger
  - c) Much smaller
  - d) impossible to determine
- (60) A shunt regulator is inefficient because

- a) It wastes power
- b) It uses series resistor & shunt transistor
- c) The ratio of output to input power is low
- d) All of the above