Total number of printed pages: 5 **D/4th/DIE401**

2021

ELECTRONICS DEVICES AND CIRCUITS-II

Full Marks: 60

Time: 2 hours

The figures in the margin indicate full marks for the questions.

A. Multiple Choice Questions 1 x 20=20

1. Op-amp can be used as
   a. Voltage regulator
   b. Comparator
   c. Pulse generator
   d. All of these
2. Op-amp can amplify
   a. D.C. signal
   b. A.C. signal
   c. Both (a) and (b)
   d. None of the above
3. An ideal Op-amp has
   a. Infinite voltage gain
   b. High output resistance
   c. High slew rate
   d. Very low CMRR
4. For an inverting amplifier
   a. Output voltage is out of phase with input
   b. Output voltage is in phase with input
   c. Output voltage is an impulse
   d. None of the above

5. Op-amp can be effectively utilized in linear application by controlling
    a. CMRR
    b. Slew rate
    c. Gain
    d. Bandwidth
6. Which amplifier is used when we require an output which is equal to the input multiplied by positive constant?
    a. Inverting amplifier
    b. Non inverting amplifier
    c. Subtractor
    d. Differentiator
7. An integrator converts a D.C. signal into linearly increasing _____ signal.
    a. Pulse wave
    b. Ramp
    c. Saw tooth
    d. Impulse
8. A voltage follower
    a. Is non inverting
    b. Has no feedback
    c. Has gain one
    d. All of the above
9. Negative feedback
    a. Reduces gain
    b. Reduces distortion
    c. Both (a) and (b)
    d. Increases output impedance
10. In an LC transistor oscillator the active device is
    a. LC tank circuit
    b. Biasing circuit
    c. Transistor
    d. None of the above

11. In an LC oscillator the frequency of oscillator is _____ L or C.
    a. Proportional to square of
    b. Directly proportional to
    c. Independent of the values of
    d. Inversely proportional to square root of
12. A wien bridge oscillator uses _____ feedback.
    a. Only positive
    b. Only negative
    c. Both positive and negative
    d. None of the above
13. An oscillator differs from an amplifier because it
    a. Has more gain
    b. Requires no input signal
    c. Always has the same input
    d. Requires no D.C. supply
14. A tuned amplifier is used in
    a. Radio frequency
    b. Low frequency
    c. Audio frequency
    d. None of the above
15. Potential instability can be seen
    a. Single tuned amplifier
    b. Double tuned amplifier
    c. Stagger tuned amplifier
    d. None of the above
16. The resonance curve of the tuned amplifier for a high value of Q
    a. Is flat
    b. Is sharp
    c. Has high bandwidth
    d. None of the above

17. For faster switching action of a transistor
    a. A capacitor may be connected across the base resistance
    b. A capacitor may be connected in series with the base resistance
    c. A capacitor may be connected across the emitter resistance
    d. The value of coupling capacitor may be increased.
18. _____ multivibrator is a square wave oscillator
    a. Monostable
    b. Astable
    c. Bistable
    d. None of the above
19. When a transistor is used as a switch its operation is confined in
    a. Cut off region
    b. Saturation region
    c. Active region
    d. (a) and (b) both
20 The frequency of oscillation of an astable multivibrator depends on the
    a. RC value of circuit
    b. Value of transistor β
    c. Width of input impulse
    d. Collector load resistors

B. Very Short Question 2*6=12

1. What is virtual ground theory?
2. Why tuned amplifiers cannot be operated between 30 Hz to 10 Hz?
3. State the conditions under which a feedback amplifier works as an oscillator.
4. What is meant by CMRR? Explain whether this should be very high or very low for an Op-amp amplifier.
5. What are the advantages of negative feedback amplifier?
6. What is the importance of wien bridge oscillator?

C Short Question 4*7=28

1. How bandwidth can be changed in the response curve by varying degree of

coupling in double tuned amplifier?

2. Describe inverting and non-inverting Op-amp.
3. Describe Hartley oscillator circuit and explain its action.
4. Find the operating frequency of a transistor Hartley oscillator if L1=100 μH, L2=1 mH and C=20pF.
5. What is a multivibrator? Explain the principle on which it works.
6. Draw thevenin's equivalent circuit of a voltage amplifier and derive its input voltage and output voltage.
7. Find Vo for the circuit shown in the following: