SECTION – A

Answer **all** questions :

1. If the input coupling capacitor is open, the AC input voltage will
   a) decrease
   b) increase
   c) be zero
   d) none of these

2. The phase shift oscillator has
   a) Three lead of log circuit
   b) Two lead or log circuit
   c) Twin T filter
   d) None of these

3. At the unity-gain frequency the open loop voltage gain is
   a) zero
   b) infinity
   c) one
   d) avmd

4. When the Q point moves along the load line, V_{CE} decreases, then the collector current
   a) decreases
   b) remains same
   c) double
   d) increase

5. A transistor acts like a diode and
   a) voltage source
   b) current source
   c) resistance
   d) power supply

6. When a JFET is cutoff the depletion layers are
   a) conducting
   b) touching
   c) far apart
   d) very close together

7. The Hartley oscillator uses
   a) negative feedback
   b) two inductors
   c) a tickler coil
   d) tungsten lamp

8. A Wien bridge oscillator uses
   a) Positive feedback
   b) Negative feedback
   c) Both types of feedback
   d) An LC tank circuit   (2×1 = 2W)

SECTION – B

Answer **any six** questions :

9. Draw the output characteristics of an NPN transistor in CE configuration. Define Beta of transistor.

10. What should be the minimum value of β of a transistor used in a RC phase shift oscillator. (write down the formula used) ?

11. Define slew rate of an op-amp. What is the slew rate of op-amp 741 C ?

12. Explain the Barkhauesen criteria for oscillations.

13. What is miller effect ? How does it affect the gain of a CE amplifier ?

14. How can peaking be obtained using an inverting amplifier ?

15. What is a Class C tuned amplifier ? Give its use.

16. Distinguish between coupling and bypass capacitors.   (6×1=6W)

SECTION – C

Answer **any nine** questions :

17. Explain the difference between dc and ac voltage followers.

18. Explain what is meant by leakage currents in a transistor. A transistor has $\alpha = 0.99$, $I_B = 50 \, \mu A$ and leakage current of $5 \, \mu A$. Calculate I_C and I_E.

19. Explain the voltage divider bias method of biasing a transistor. Why is it a popular bias circuit ?

20. What are the characteristics of a class A amplifier ? Derive an expression for the power efficiency.

21. Explain the principle of feedback amplifiers. Compare positive feedback and negative feedback.

22. Explain the working of an LC oscillator. Design an LC oscillator to work at 2 KHz.

23. Explain an integrating circuit. What are their uses ?

24. Draw the AC loadline of a transistor in CE configuration. What is Q point ? How is it chosen ?

25. For a N channel JFET, $I_{DSS} = 8.7$ mA, $V_p = -3V$, $V_{GS} = -1V$. Find the values of (a) I_D (b) g_{mo} (c) g_m.

26. What are power amplifiers ? Give a comparison of the different classes of power amplifiers.

27. In a negative feedback amplifier, $A = 100$, $B = 0.04$ and $V_i = 50$ mV. Find (a) gain with feedback (b) output voltage (c) feedback factor (d) feedback voltage.

28. Explain the construction and working of Hartley oscillator.   (9×2=18 W)

SECTION – D

Answer **any one** questions :

29. Explain the construction and working of a CE amplifier. How is the frequency response and bandwidth studied ?

30. Describe the construction and working of an RC phase shift oscillator. Design an RC PSO to have a frequency of one KHz.   (1×4=4W)

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