DF-2990
Second Year B. Sc. (Sem. III) Examination
March / April - 2016
Electronics : Paper - III
(Electronic Circuits & Applications)

Time : Hours] [Total Marks : 50

Instructions :

(1) Fill up strictly the details of signs on your answer book.

Name of the Examination :
SECOND YEAR B. Sc. (SEM. 3)
Name of the Subject :
ELECTRONICS - 3
Subject Code No. : 2990 Section No. (1, 2,.....) : 3

(2) All 28 questions are compulsory.

(3) All Symbols and abbreviations have their usual meaning.

(4) Non-programmable calculators are allowed.

(5) Assume data if necessary.

Q. 1 to 12 Multiple choice questions : (1 mark)
Q. 13 to 22 Multiple Choice Questions : (2 marks)
Q. 23 to 28 Multiple Choice Questions : (3 marks)

O.M.R. Sheet भरवा अंगे-अंगे अग्त्य-अग्त्य सूचनाओ अपेक्ष "O.M.R. Sheet"-ला पायला आफिब भरिएँ.
Important instructions to fillup O.M.R. Sheet is given back side of provided O.M.R. Sheet.
1. In the low frequency region of RC coupled amplifier the effect of capacitance is such that
   (A) The series capacitors and shunt capacitors are opened
   (B) The series capacitors and shunt capacitors are shorted
   (C) The series capacitors are shorted
   (D) Shunt capacitors are opened

2. The half power frequency is also known as
   (A) Break frequency
   (B) All of these
   (C) Cut off frequency
   (D) Corner frequency

3. What is the phase difference between input voltage and output voltage in a common emitter amplifier?
   (A) 0
   (B) 90°
   (C) 180°
   (D) -180°

4. For proper operation to transistor as an amplifier, (CE configuration) base emitter junction should be _______ and collector emitter junction should be ________.
   (A) (forward biased, forward biased)
   (B) (reverse biased, reverse biased)
   (C) (reverse biased, forward biased)
   (D) (forward biased, reverse biased)
5. What is the main advantage of CE amplifier over CB amplifier as far as biasing is concerned?
   (A) Less voltage gain
   (B) None of these
   (C) Single battery operation
   (D) Small input resistance

6. Which circuit is the best biasing circuit?
   (A) Collector to base bias circuit
   (B) Voltage divider bias with emitter bias
   (C) Fixed bias circuit
   (D) Emitter bias circuit

7. Input resistance for CB amplifier is
   (A) Equal to $h_{ib}$
   (B) Greater than $h_{ie}$
   (C) Greater than $h_{lb}$
   (D) Less than $h_{lb}$

8. Power gain is always
   (A) Zero
   (B) All these
   (C) A positive number
   (D) A negative number
9. Input resistance for CC amplifier is
   (A) Zero
   (B) None of these
   (C) High
   (D) Low

10. The function of a transistor is to do __________.
    (A) Filtering
    (B) Regulation
    (C) Rectification
    (D) Amplification

11. Stabilization means making ______ independent of temperature variations or variations of transistor parameters.
    (A) Input Current
    (B) Collector Current
    (C) Operating Point
    (D) Supply Voltage

12. Which circuit has highest stability factor?
    (A) Collector to base bias circuit
    (B) Voltage divider bias with emitter bias
    (C) Fixed bias circuit
    (D) Emitter bias circuit
13. Select the correct relation for CE configuration
   (A) \( V_c = h_{ie}I_c + h_{re}V_c \), \( I_c = h_{ie}I_c + h_{oe}V_b \)
   (B) \( V_c = h_{ie}I_b - h_{re}V_c \), \( I_b = h_{ie}I_c - h_{oe}V_c \)
   (C) \( V_b = h_{ie}I_b + h_{re}V_c \), \( I_c = h_{ie}I_b + h_{oe}V_c \)
   (D) \( I_b = h_{ie}I_b + h_{re}V_c \), \( V_c = h_{ie}I_b + h_{oe}V_c \)

14. \( h_{ie} \) is
   (A) Zero
   (B) All of these
   (C) A positive number
   (D) A negative number

15. What is the general equation for voltage gain of an amplifier with feedback?
   (A) \( A(1-A\beta) \)
   (B) \( A(1+A\beta) \)
   (C) \( A/(1-A\beta) \)
   (D) \( A/(1+A\beta) \)

16. An amplifier has a voltage gain of 40. Calculate feedback in dB if a 10% negative feedback is introduced?
   (A) 1.4 dB
   (B) -1.4 dB
   (C) 14 dB
   (D) -14 dB

17. An amplifier has a voltage gain of 100. What will be the voltage gain if 10% negative feedback is given?
   (A) 90.0
   (B) 0.909
   (C) 9.09
   (D) 90%
18. An amplifier has a voltage gain of 40 and 200 kHz bandwidth. Calculate the bandwidth with feedback if a 10% negative feedback is introduced in series with input.
   (A) 1000 kHz
   (B) 500 kHz
   (C) 100 kHz
   (D) 10 kHz

19. Example of voltage series negative feedback amplifier is
   (A) CC amplifier
   (B) CB amplifier
   (C) CE amplifier with bypass capacitor
   (D) CE amplifier without bypass capacitor

20. The circuit which exhibits 100% negative feedback
   (A) Collector to base biasing circuit
   (B) Emitter follower
   (C) CE amplifier with bypass capacitor
   (D) CE amplifier without bypass capacitor

21. For voltage shunt feedback amplifier input resistance
   (A) Becomes zero
   (B) None
   (C) Increases
   (D) Decreases

22. Voltage shunt feedback amplifier is a
   (A) Transconductance amplifier
   (B) Transresistance amplifier
   (C) Pure voltage amplifier
   (D) Pure current amplifier
23 With negative feedback the bandwidth ______ and the noise ______.

(A) decreases, increases

(B) decreases, decreases

(C) increases, increases

(D) increases, decreases

24 If an amplifier has a bandwidth of 200 kHz and voltage gain of 50, what will be new bandwidth and gain if 5% negative feedback is introduced?

(A) 70 kHz, 14.28

(B) 700 Hz, 1.428

(C) 0.7 MHz, 14.28

(D) 7 kHz, 142.8

25 Design a voltage divider bias circuit for the following specifications

\( V_{cc} = 20 \text{ V}, \; I_c = 10 \text{ mA}, \; V_{CE} = 8 \text{ V}, \; \beta = 80 \)

(A) \( R_E = 200 \text{ m}\Omega, \; R_C = 10 \text{ k}\Omega, \; R_2 = 16 \text{ \Omega}, \; R_1 = 1 \text{ k}\Omega \)

(B) \( R_E = 20 \text{ \mu}\Omega, \; R_C = 1 \text{ m}\Omega, \; R_2 = 1600 \text{ M\Omega}, \; R_1 = 10 \text{ k}\Omega \)

(C) \( R_E = 200 \text{ \Omega}, \; R_C = 1 \text{ k}\Omega, \; R_2 = 1600 \text{ \Omega}, \; R_1 = 10 \text{ k}\Omega \)

(D) \( R_E = 200 \text{ k}\Omega, \; R_C = 1 \text{ \Omega}, \; R_2 = 160 \text{ \Omega}, \; R_1 = 1 \text{ k}\Omega \)

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26. The frequency range of an audio amplifier is

(A) Few kHz to 100 MHz

(B) All of these

(C) 0 to few Hz

(D) 20 Hz to 20 kHz

27. In class B amplifier the Q – point is located

(A) Near the cut off region

(B) Below the cut off region

(C) At the centre of the active region

(D) Near the saturation region

28. An ideal current amplifier must have

(A) Zero input resistance and infinite output resistance

(B) Infinite input resistance and infinite output resistance

(C) Infinite input resistance and zero output resistance

(D) Zero input resistance and zero output resistance