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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)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup 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. : 2 9 9 0 ☛ Section No. (1, 2,.....) : 3

Seat No. :

Student's Signature

(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 Choise Questions : (2 marks)

Q. 23 to 28 Multiple Choice Questions : (3 marks)

***O.M.R. Sheet* ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ *O.M.R. Sheet*ની પાછળ છાપેલ છે.**

Important instructions to fillup O.M.R. Sheet is given back side of provided O.M.R. Sheet.

1 What is the main advantage of CE amplifier over CB amplifier as far as biasing is concerned ?

(A) None of these

(B) Single battery operation

(C) Small input resistance

(D) Less voltage gain

2 Which circuit is the best biasing circuit ?

(A) Voltage divider bias with emitter bias

(B) Fixed bias circuit

(C) Emitter bias circuit

(D) Collector to base bias circuit

3 Input resistance for CB amplifier is

(A) Greater than h_{ie}

(B) Greater than h_{ib}

(C) Less than h_{ib}

(D) Equal to h_{ib}

4 Power gain is always

(A) All these

(B) A positive number

(C) A negative number

(D) Zero

5 Input resistance for CC amplifier is

(A) None of these

(B) High

(C) Low

(D) Zero

6 The function of a transistor is to do _____.

(A) Regulation

(B) Rectification

(C) Amplification

(D) Filtering

7 Stabilization means making _____ independent of temperature variations or variations of transistor parameters.

(A) Collector Current

(B) Operating Point

(C) Supply Voltage

(D) Input Current

8 Which circuit has highest stability factor ?

(A) Voltage divider bias with emitter bias

(B) Fixed bias circuit

(C) Emitter bias circuit

(D) Collector to base bias circuit

9 In the low frequency region of RC coupled amplifier the effect of capacitance is such that

(A) The series capacitors and shunt capacitors are shorted

(B) The series capacitors are shorted

(C) Shunt capacitors are opened

(D) The series capacitors and shunt capacitors are opened

10 The half power frequency is also known as

(A) All ot these

(B) Cut off frequency

(C) Corner frequency

(D) Break frequency

11 What is the phase difference between input voltage and output voltage in a common emitter amplifier ?

(A) 90^{o}

(B) 180^{o}

(C) -180^{o}

(D) 0

12 For proper operation to transistor as an amplifier, (CE configuration) base emitter junction should be _____ and collector emitter junction should be _____.

(A) (reverse biased, reverse biased)

(B) (reverse biased, forward biased)

(C) (forward biased, reverse biased)

(D) (forward biased, forward biased)

13 The circuit which exhibits 100% negative feedback

(A) Emitter follower

(B) CE amplifier with bypass capacitor

(C) CE amplifier without bypass capacitor

(D) Collector to base biasing circuit

14 For voltage shunt feedback amplifier input resistance

(A) None

(B) Increases

(C) Decreases

(D) Becomes zero

15 Voltage shunt feedback amplifier is a

(A) Transresistance amplifier

(B) Pure voltage amplifier

(C) Pure current amplifier

(D) Transconductance amplifier

16 Select the correct relation for CE configuration

(A) $V_c = h_{ie}I_b - h_{re}V_c$, $I_b = h_{fe}I_c - h_{oe}V_c$

(B) $V_b = h_{ie}I_b + h_{re}V_c$, $I_c = h_{fe}I_b + h_{oe}V_c$

(C) $I_b = h_{ie}I_b + h_{re}V_c$, $V_c = h_{fe}I_b + h_{oe}V_c$

(D) $V_e = h_{ie}I_c + h_{re}V_c$, $I_c = h_{fe}I_c + h_{oe}V_b$

17 h_{fe} is

(A) All of these

(B) A positive number

(C) A negative number

(D) Zero

18 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) $A(1-A\beta)$

19 An amplifier has a voltage gain of 40. Calculate feedback in dB if a 10% negative feedback is introduced ?

(A) –1.4 dB

(B) 14 dB

(C) –14 dB

(D) 1.4 dB

20 An amplifier has a voltage gain of 100. What will be the voltage gain if 10% negative feedback is given ?

(A) 0.909

(B) 9.09

(C) 90%

(D) 90.0

21 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) 500 kHz

(B) 100 kHz

(C) 10 kHz

(D) 1000 kHz

22 Example of voltage series negative feedback amplifier is

(A) CB amplifier

(B) CE amplifier with bypass capacitor

(C) CE amplifier without bypass capacitor

(D) CC amplifier

23 In class B amplifier the Q – point is located

(A) Below the cut off region

(B) At the centre of the active region

(C) Near the saturation region

(D) Near the cut off region

24 An ideal current amplifier must have

(A) Infinite input resistance and infinite output resistance

(B) Infinite input resistance and zero output resistance

(C) Zero input resistance and zero output resistance

(D) Zero input resistance and infinite output resistance

25 With negative feedback the bandwidth _____ and the noise _____.

(A) decreases, decreases

(B) increases, increases

(C) increases, decreases

(D) decreases, increases

26 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) 700 Hz, 1.428

(B) 0.7 MHz, 14.28

(C) 7 kHz, 142.8

(D) 70 kHz, 14.28

27 Design a voltage divider bias circuit for the following specifications $V_{cc} = 20$ v, $I_c = 10$ mA, $V_{CE} = 8$ V, $\beta = 80$

(A) $R_E = 20\,\mu\Omega$, $R_C = 1\ m\Omega$, $R_2 = 1600M\Omega$, $R_1 = 10k\Omega$

(B) $R_E = 200\Omega$, $R_C = 1\ k\Omega$, $R_2 = 1600\Omega$, $R_1 = 10k\Omega$

(C) $R_E = 200k\Omega$, $R_C = 1\Omega$, $R_2 = 160\Omega$, $R_1 = 1k\Omega$

(D) $R_E = 200m\Omega$, $R_C = 10\ k\Omega$, $R_2 = 16\Omega$, $R_1 = 1k\Omega$

28 The frequency range of an audio amplifier is

(A) All of these

(B) 0 to few Hz

(C) 20 Hz to 20 kHz

(D) Few kHz to 100 MHz