SUBJECT CODE: 11PH/MC/SE64
B.Sc. DEGREE EXAMINATION APRIL 2016
BRANCH III - PHYSICS
SIXTH SEMESTER
REG. No._____

COURSE : **MAJOR – CORE**
PAPER : **SEMICONDUCTOR ELECTRONICS**
TIME : **30 MINS.**   **MAX. MARKS: 30**
SECTION – A
TO BE ANSWERED IN THE QUESTION PAPER ITSELF
ANSWER ALL QUESTIONS: **(30 x 1 = 30)**
I   Choose the Correct Answer:

1. The best method of transistor biasing is
    a) potential divider   b) base resistor   c) common emitter   d) common base

2. The intersection of the d.c. load line with the base current is the
    a) operation point   b) stability factor   c) amplification factor   d) current gain

3. A.C. load line is ----------- d.c. load line
    a) same as   b) steeper than   c) flatter than   d) independent of

4. Amplifiers are cascaded to increase the
    a) current   b) voltage   c) gain   d) power

5. The gain of multistage amplifier is equal to the --------of gains of individual stages.
    a) addition   b) subtraction   c) r,m.s. value   d) product

6. RC coupled amplifier is used to amplify the
    a) current   b) voltage   c) power   d) resistance

7.   In FET, the output characteristics are controlled by
    a) input current   b) output current   c) input voltage   d) output voltage

8.   The current conduction in JFET is by
    a) electrons only   b) holes only   c) both electrons and holes   d) electrons or holes

9.   A UJT is switched on when input voltage equals
    a) cut-off voltage   b) saturation voltage   c) peak-point voltage   d) valley-point voltage

10. The input impedance of an OPAMP is
    a) small   b) very small   c) large   d) very large

11. The phase difference between input and output of a non-inverting OPAMP is
    a) 0   b) 90   c) 180   d) 270

12. $V_0 = -(R_f/R_1)V_i$ is the output of
    a) inverting OPAMP   b) non inverting OPAMP   c) source follower   d) differentiator

13. Most commonly used code is
    a) octal   b) hexadecimal   c) BCD   d) binary

14. Each binary digit is referred as a
    a) string   b) word   c) byte   d) bit

15. Digital signals have ------ discrete values.
    a) 1   b) 2   c) 8   d) 16

II   Fill in the blanks:

16. Maintaining the operating point, independent of temperature changes is known as _____.

17. The relation between gain and frequency of an amplifier is known as _____.

18. JFET is a _____ transistor.

19. Voltage follower OPAMP is called _____.

20. _____ is a continuously varying signal.

III   State whether true or false:

21. The change in amplification factor results in faithful amplification.
22. The bypass capacitor transfers the ac output of one stage to the input of the next stage.
23. UJT has one PN junction and 3 terminals.
24. The differential amplifier amplifies the difference between two signals.
25. D/A converters accepts digital signal and converts it into analog voltage or current.

IV   Answer briefly:
26. What is stability factor?

27. How does a transistor act as an amplifier?

28. What is the operational difference between FET and UJT?

29. Justify the name given to operational amplifier.

30. What is BCD code?

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TIME   :   **2 ½ HOURS**   **MAX. MARKS: 70**

SECTION – B
ANSWER ANY FIVE QUESTIONS: **(5 x 5 = 25)**

1. What is faithful amplification? Write the conditions to be satisfied to achieve faithful amplification in a transistor amplifier.

2. A transistor is to be operated at zero signal. I_c = 1mA, V_{cc} =12V, V_{BE}= 0.3V and β= 100. Find the value of R_B in the base resistor method.

3. An amplifier has a voltage gain of 80 and a current gain of 120. Determine the power gain of the amplifier.

4. Define the JFET parameters and write the relation between them.

5. The intrinsic stand off ratio for a UJT is determined to be 0.6. If the inter-base resistance is 10KΩ, find the values of R_{B1} and R_{B2}.

6. Solve the given simultaneous equations using operational amplifiers: x+2y=0 and 2x-y=1.

7.   Convert the following i) $(49)_{10}$ to digital ii) $(110011)_2$ to decimal iii) 749 to BCD iv) 0000 1000 1001 0101 to decimal.

SECTION – C
ANSWER ANY THREE QUESTIONS: **(3 X 15 = 45)**

8. Describe the potential divider bias method in detail.

9. Explain the working and frequency response of an RC coupled amplifier with diagrams.

10. Discuss the characteristics of UJT with suitable diagrams.

11. Explain the function of differential amplifier hence CMMR.

12. Explain the function of D/A converter using R, 2R ladder with suitable diagram.

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