B.SC. ELECTRONICS
SEMESTER- 3RD
ANALOG ELECTROICS
BSE-302

Duration: 3 Hrs.   Marks: 70

PART : A (OBJECTIVE) = 20
PART : B (DESCRIPTIVE) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.   Marks: 50

[Answer question no. One (1) & any four (4) from the rest]

1. Discuss the effect of middle frequency in RC coupled amplifier.   10

2. (a) What are the different types of open loop OP-AMP configuration?   (6+4=10)
    Discuss with the help of diagram.

    (b) State Barkhausen criterion of oscillation.

3. (a) Explain with the help of diagram the construction of Multistage   (6+4=10)
    transistor amplifier.

    (b) Write short notes on CMRR.

4. (a) In a negative feedback amplifier, $A=100$, $\beta=0.04$ and $V_s=50$ mV . Find   (4+6=10)

    (i) gain without feedback   (ii) output voltage
    (iii) feedback factor   (iv) feedback voltage.

    (b) Derive the expression for change in input impedance in voltage-
    series-feedback.

5. (a) Show that the percentage change in gain with feedback is much less   (6+4=10)
    than percentage change in gain without feedback.
    (b) Explain the concept of virtual ground.

6. (a) Explain the working of the oscillatory circuit with the help of   (6+4=10)
    necessary diagram.
    (b) Find the expression for overall efficiency in Class B power amplifier.

7. (a) Explain the construction and operation of RC phase-shift oscillator. (8+2=10)
   (b) Draw the transfer characteristics of OP-AMP.

8. (a) Explain with the help of diagram the construction of Hartley (5+5=
   oscillator.
   (b) Show that the output is equal to the average of the three three inputs
   in Summing amplifier.

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[PART-A : Objective]

Choose the correct answer from the following :   **1X20=20**

1. In voltage –series feedback, input resistance
   a. Increases
   b. Decreases
   c. Does not change
   d. None of the above

2. When the collector current flows at all times during full cycle of signal, the operation is known as
   a. Class A operation
   b. Class B operation
   c. Class C operation
   d. None of the above

3. For the negative feedback,
   a. $A_f=A$
   b. $A_f<A$
   c. $A_f>A$
   d. All of the above

4. In case of positive feedback,
   a. $A_f=0$
   b. $A_f=1$
   c. $A_f=\infty$
   d. All of the above

5. The range of audio frequency oscillator is
   a. 20 Hz-20 kHZ
   b. 20 kHz-30 MHz
   c. 30 MHz-300 MHz
   d. None of the above

6. The Barkhausen criterion of oscillation is
   a. $A\beta=0$
   b. $A\beta=1$
   c. $A\beta=2$
   d. Both (a) and (b)

7. In RC Phase Shift Oscillator, the phase angle in each RC section is
   a. 90 degree
   b. 180 degree
   c. 60 degree
   d. 360 degree

8. The overall efficiency in class B amplifier is
   a. 50%
   b. 30%
   c. 75.5%
   d. 78.5%

9. The open-loop voltage gain of an ideal OP-AMP is
   a. Zero
   b. Infinite
   c. 1
   d. 10

10. In inverting OP-AMP, the output is given by
    a. $+AV_{id}$
    b. $-AV_{id}$
    c. A/V_{id}
    d. All of the above

11. The potential difference between two terminals in virtual ground is
    a. Infinite
    b. Zero
    c. 1
    d. All of the above

12. In middle frequency range, coupling capacitor in RC-Coupled amplifier is
    a. Very large
    b. Small
    c. Neglected
    d. None of the Above

13. The reciprocal of sensitivity is called
    a. Stabilization of gain
    b. Desensitivity
    c. Distortion
    d. None of the above

14. In Hartley Oscillator , the tank circuit consists of
    a. One inductor and two variable capacitors
    b. One variable capacitor and two inductors
    c. One inductor and one variable capacitor
    d. One inductor, one capacitor and one resistance

15. The total phase shift in Hartley Oscillator is
    a. 180 degree
    b. 360 degree
    c. 120 degree
    d. None of the above

16. In a sub -tractor, the output voltage is equal to
    a. The difference of two input voltages
    b. Sum of two input voltages
    c. Zero
    d. Unity

17. A multi stage amplifier consists of
    a. Input stage and output stage
    b. Intermediate stage
    c. Level shifting stage
    d. All of the above

18. An Oscillator is a device that
    a. Generates an alternating voltage
    b. Generates an ac output without requiring the input
    c. Converts d.c. energy into a.c. energy at very high frequency
    d. All of the above

19. The Colpitt's oscillator consists of
    a. Two inductor & two capacitor
    b. Two capacitor & one inductor
    c. Two inductor and one capacitor
    d. All of the above

20. Regarding the negative feedback in amplifier which statement is wrong?
    a. It widens the separation between 3-db frequencies
    b. It increases the gain bandwidth product
    c. It improves the gain stability
    d. It reduces distortion

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UNIVERSITY OF SCIENCE & TECHNOLOGY, MEGHALAYA

[PART (A) : OBJECTIVE]

Duration : 20 Minutes

Course : ....

Semester : .... Roll No : ....

Enrollment No : .... Course code : ....

Course Title : ....

Session : .... 2017-18 .... Date : ....

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Instructions / Guidelines

> The paper contains twenty (20) / ten (10) questions.

> Students shall tick (✓) the correct answer.

> No marks shall be given for overwrite / erasing.

> Students have to submit the Objective Part (Part–A) to the invigilator just after completion of the allotted time from the starting of examination.

Full Marks	Marks Obtained
20	