FACULTY OF ENGINEERING
B.E. 2/4 (EE/Inst.) II Semester (Old) Examination, May/June 2012
ELECTRONIC ENGINEERING – II

Time : 3 Hours]

[Max. Marks : 75

Note : Answer **all** questions of Part **A**.
Answer **any five** questions from Part **B**.

PART – A
(25 Marks)

1. How does an amplifier respond to a step input ?

   3

2. The gain and distortion of an amplifier are 200 and 10% respectively, without feedback. If the stage has 15% of its output voltage applied as negative feedback, find the distortion of the amplifier with feedback.

   3

3. Write in words the two Backhausen conditions for oscillations.

   2

4. In the forward path of an oscillator, two amplifiers of equal gain are cascaded. If

   the feedback path transfer function is $\frac{1}{81}$, find the gain of each amplifier.

   3

5. Distinguish between common mode gain and differential mode gain in a differential amplifier.

   3

6. What is meant by Class A, Class B and Class C operation of amplifiers ?

   3

7. How are the capacitors and resistances connected for differentiating and integrating circuits ?

   2

8. What is cross over distortion ?

   2

9. To match a 20 Ω speaker load to a power amplifier so that the effective load may be 8k Ω , determine the turns ratio of the transformer.

   2

10. Distinguish between positive and negative feedback.

   2

PART – B
(50 Marks)

11. a) What are the four different types of negative feedback employed in amplifiers and show those by block diagrams along with input and output connections.

    b) The gain of an amplifier is decreased to 10,000 with negative feedback from its gain of 60,000. Calculate the feedback factor. Express the amount of –ve feedback in db.

12. a) What are the factors that effect the frequency stability of an oscillator ? How stability can be improved in oscillators ?

   b) Derive an expression for frequency of oscillation of Hartley oscillator using BJT.

13. a) What is drift in DC amplifier ? How can it be minimized ?

   b) A differential amplifier has inputs $V_{i1} = 12$ mV, $V_{i2} = 10$ mV. It has a differential gain of 60 dB. If the CMRR of the amplifier is 80 dB, find the percentage error in the output and the error voltage. If the CMRR is made 100 dB, by how much does the error decrease ?

14. a) What are the advantages of push-pull amplifiers ? Show that even harmonics will be eliminated in a push-pull connection.

   b) The zero signal collector current of a power amplifier working in Class-A operation is 100 mA. If the dc supply voltage $V_{cc} = 12$ V, determine :

   i) the maximum ac power output

   ii) the power rating of the transistor

   iii) the maximum collector efficiency.

15. a) What is the response of step voltage input to a high pass and low pass RC circuit ? How do these filters act as a differentiator and an integrator.

   b) With a circuit diagram, explain how diode clippers are used in pairs to perform double ended limiting independently.

16. a) What is meant by harmonic distortion ? Calculate the second harmonic distortion in the output of a power amplifier.

   b) Explain the necessity of clamping circuits.

17. Write short notes on **any three** :

   a) Crystal controlled oscillators.

   b) Reduced sensitivity to gain variations in negative feedback.

   c) Wein bridge oscillator.

   d) Transformer coupled power amplifiers.