OR

An amplifier has a bandwidth of 500 kHz and voltage gain of 100. What should be the amount of negative feedback if the bandwidth is extended to 5 mHz? What will be the new gain after negative feedback is introduced?

Unit - V

5. a) Draw the circuit diagram of a class B push pull power amplifier using npn transistor.

    b) What do you mean by total harmonic distortion?

    c) Explain the derating curve.

    d) Discuss the thermal analogy of a power transistor.

    OR

    Distinguish between class A, B and C amplifier's.

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Roll No ....

EX - 304

B.E. III Semester

Examination, June 2014

Electronic Devices and Circuits - I

Time : Three Hours

Maximum Marks : 70

Note: i)   Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii)   All parts of each question are to be attempted at one place.

iii)   All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv)   Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) How a potential barrier is formed in a P.N. junction?

    b) How does a LED emit light?

    c) Why is the ripple factor of a half wave rectifier higher than that of full wave rectifier?

    d) Explain the working of a tunnel diode. Draw its V.I. characteristics.

    OR

Design a zener regulator that will maintain an output voltage of 20V across 1 kΩ load when the input voltage is 30-50V. Assume zener knee current is negligible as compared to the load current. Calculate maximum power of the diode.
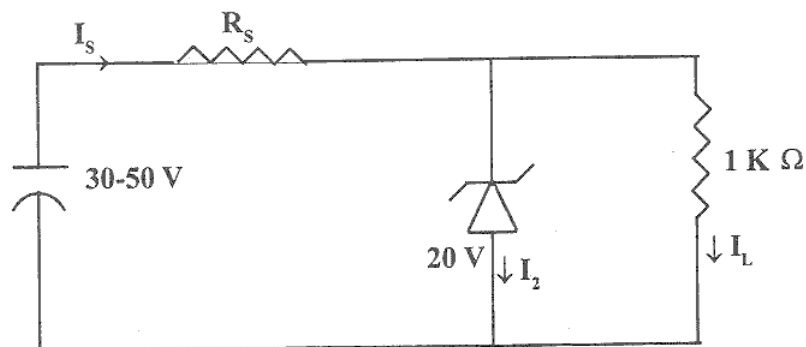

Fig.1

Unit - II

2. a) Explain the early effect of a bipolar transistor.

   b) Define common base and common emitter current gains and state the relation between them.

   c) Draw the transfer characteristics of an n-channel FET.

   d) Explain with diagram the principle of operation of an n-MOSFET.

OR

Draw and explain the V-I characteristics of a UJT. Also mention its applications.

Unit - III

3. a) Since the gain of an emitter follower is less than unity, what is the use of having such an amplifier?

   b) How do coupling and by pass capacitors affect the frequency response of an amplifier stage?

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c) What is the effect of the overall gain of cascading amplifiers?

d) Derive the h-parameters of a CE amplifier.

OR

For a CE amplifier shown in fig.2, and given that $h_{ie} = 1.1$ kΩ; $h_{re} = 2.5 \times 10^{-4}$; $h_{fe} = 50$; $h_{oe} = 24\mu A/V$. Calculate A_i, A_v, R_i, A_{is} and A_{rs} for $R_L = 10$kΩ.
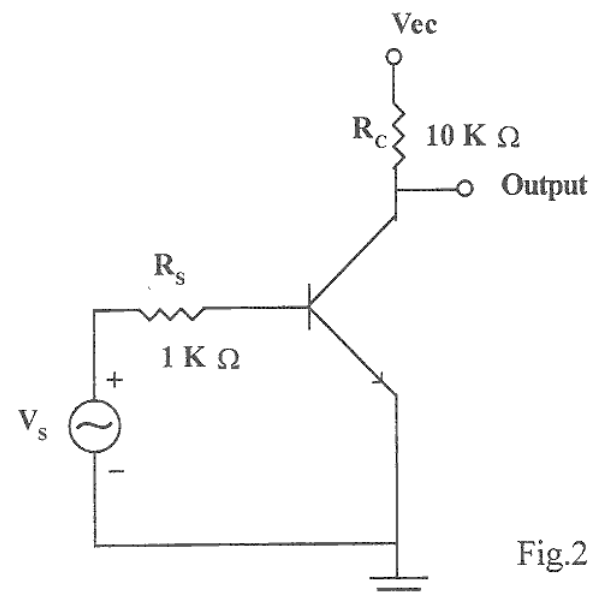

Fig.2

Unit - IV

4. a) Explain the effect of negative feedback on gain and bandwidth of an amplifier.

   b) Explain the Barkhausen condition for sustained sinusoidal oscillations.

   c) Explain how voltage series feedback is provided in an emitter follower.

   d) Discuss the work   of a wein bridge oscillator.

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