Kaferelsheikh University
Faculty of Engineering
Department of Electrical Engineering
Year: First Subject: Electronic circuit
Name: ECE1001

Date: 26/ 5 /2019
Time allowed: 1.5 h
Full Mark: 45 degree
Final Exam: 2 page
Academic Number:

This exam measures ILOs no: a3, a4,a5,a8 ,a14, b6,c7

[1] Question One [20 degrees]:

1. Explain the structure and the principle of operation of enhancement MOSFET. Why use the V- MOSFET [5 degrees]?

2. For the fixed-bias configuration of Fig. 1, determine: [8 degrees]

(a) I_{DQ} and V_{GSQ} using a purely mathematical approach.

(b) Repeat part (a) using a graphical approach and compare results.

(c) Find V_{DS}, V_D, V_G, and V_S using the results of part (a)

3. Sketch the basic structure of n- channel JFET. [2 degrees]

4. For the network in Fig.2. The maximum power dissipation P_{Dmax}=800mw, V_{CEm}=15v, I_{cm}=100ma. Find: V_{ccm}=? Without exceeding rating. [5 degrees]

[2] Question Two[25]:

1. Sketch the r-parameter transistor models, and the relation of transistor symbol to r-parameter model. [5 degrees]

2. Sketch the load line for BJT in all its possible cases? [4 degrees]

3. Prove the relation between β and α then prove that I_{CE0}= I_{CB0} (1+β). [5degrees]

4. explain the effect of swamping on the amplifier input resistance? [3 degrees]

5. Determine the following for the network in Fig.3. (a) S(I_{CO}). (b) S(V_{BE}).

(c) S(β) using T1 as the temperature at which the parameter values are specified and β (T2) as 25% more than β (T1).

(d) Determine the net change in I_C if a change in operating conditions results in I_{CO} increasing from 0.2 to 10 μA, V_{BE} drops from 0.7 to 0.5 V, and β increases 25%. [8 degrees]

6. Find the overall maximum voltage gain for the amplifier in Figure 4 with 1 kΩ a load if it is being driven by a 300 kΩ source. [6 degrees]

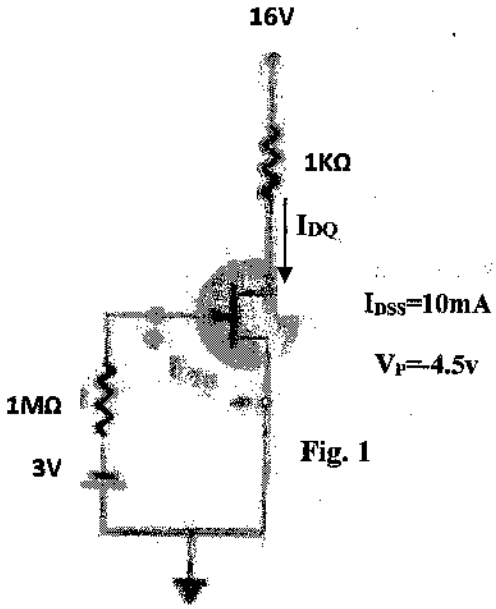

Fig. 1

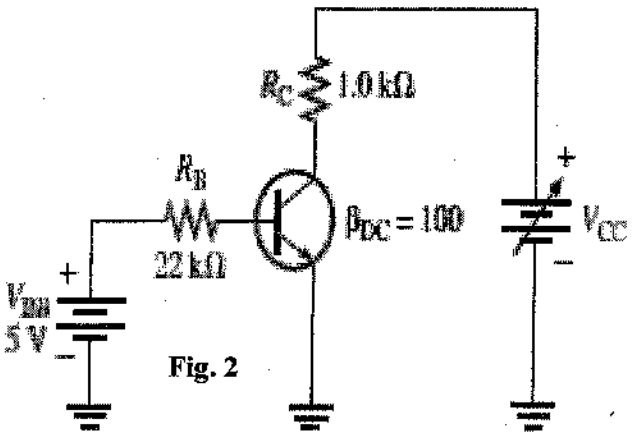

Fig. 2

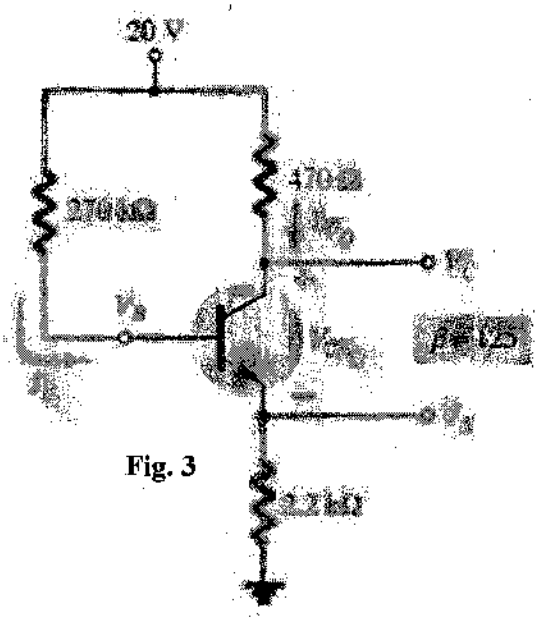

Fig. 3

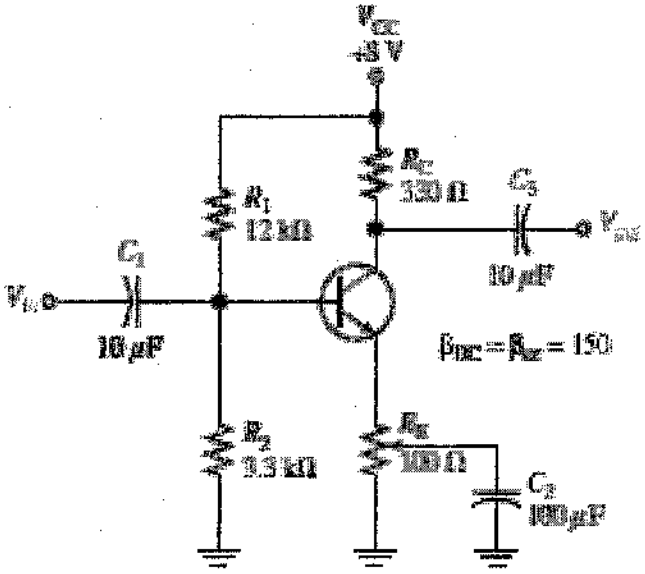

Fig. 4

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