Jordan University of Science and Technology
Electrical Engineering Department
Electronics I Final Exam

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Two Hours

Aug., 26,2002

Student name: ---------- Student I.D # ----------Seat #---------

Question One

Fill in the spaces and/or choose the right answer:

1- A good Conductor----------.
   a) opposes the movement of electrons
   b) has many free electrons
   c) must have very few electrons
   d) has many electron

2- The majority and minority carriers in a N-type Semiconductor n terials are:
   a) holes, electrons
   b) electrons, holes
   c) negative ions, holes
   d) electrons, positive ions

3- The energy diagram for an insulator shows a/an ---------- fo. hidden region between the conduction and valence bands.
   a) overlapping
   b) narrow
   c) wide

4- In it's natural state, silicon has many characteristics that are similar to a/an------- ----------
   a) conductor
   b) insulator

5- In a P-type semiconductor, current flow is supported by:
   a) electrons
   b) holes
   c) positive ions
   d) negative ions

6- At very high temperature all P-type Semiconductor material becomes:
   a) electrons
   b) Positive ionized particles
   c) Intrinsic
   d) N-type

7- The impurity used as a dopant for creating N-type material is called a/an:
   a) donar material
   b) acceptor material
   c) negative ions
   d) positive ions

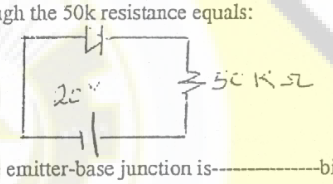
8- It's possible to form a PN junction by physically connecting a piece of P-type material to a piece of N-type material
   a) False
   b) True

9- The two elements that form a PN junction are known as the:
   a) Emitter and Collector
   b) Anode and cathode
   c) Neither a nor b
   d) Either a or b

10- When no external energy is applied to a diode, the holes and electrons will:
   a) move in a circular path
   b) are immobile until forward bias is applied
   c) electron will drift inside the material
   d) all of the above

11- A forward biased PN junction has ----------junction resistance and----------current flow.
   a) high, low
   b) low, high
   c) high, high
   d) low, low

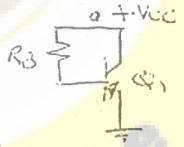
12- Refer to fig. (1), $V_{don} = 0.7$, the current flowing through the 50k resistance equals:
   a) 8mA
   b) 4mA
   c) 0.386 mA
   d) Non of the above



13- For NPN transistor operating in the ACTIVE mode, the emitter-base junction is----------biased and the collector- base junction is----------biased.

14- Base current is kept small by the fact that the base is----------doped and is very ----------

15- The circuit shown is properly biased for conduction



   a) True
   b) False

16- In all cases, the D.C and A.C load lines have different slope:
   a) False
   b) True

17- To obtain a maximum positive or negative output swing the Q-point must be located at the:
   a) Mid the A.C load line
   b) Mid the D.C load line
   c) Both a and b
   d) Neither a or b

18- In a common base configuration. current gain will equal:
   a) Alpha
   b) Beta

19- In common collector configuration there is no need for R_E if the stability is not required
   a) True
   b) False

20- To obtain maximum symmetrical output voltage swing in a common emitter circuit you need to chose the correct values at:

a) R_C and R_L

b) R_C and V_{CC}

c) R_E and R_L

d) All of the above

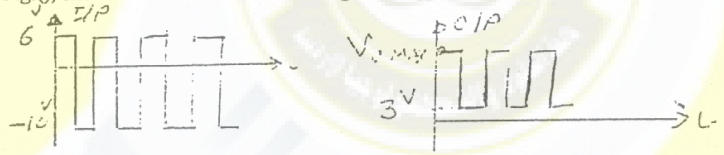
21- When working with N-channel Enhancement Mosfet , V_{GS} must have----------polarity and V_{DS} must have ----------polarity.

a) positive, positive
b) negative, negative
c) positive, negative
d) negative, positive

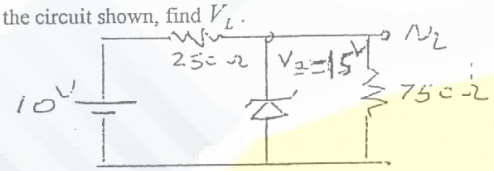
22- In enhancement P-channel MOSFET, the drain current will be----------when $V_{SG} = 0$

a) high
b) low
c) medium
d) zero

23- Fig.(), shows the I/P and the O/P voltages of a typical clamping circuit, calculate $V_{O\,max}$.



24- For the circuit shown, find V_L.



25- The Field Effect Transistor

a) Utilizes one type of charge carrier
b) Utilizes two types of charge carriers
c) Independent on charge carriers

26-For the circuit shown, increasing R_L will:

a) Increase the base-emitter resistance h_{ie}

b) Decrease the base-emitter resistance h_{ie}

c) Has no effect on the base-emitter resistance h_{ie}