ID.No./Seat No.

MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,
JAMSHORO.

FIRST TERM SECOND YEAR (3RD TERM) B.E.(ELECTRICAL)
REGULAR EXAMINATION 2011 OF 10-BATCH.

ELECTRONIC DEVICES & CIRCUITS

Dated: 22-05-2011. Time Allowed: 03 Hours. Max.Marks-80.

NOTE. ATTEMPT ANY **FIVE** QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q.No.

1. (a) What is a diode? Explain its V-I characteristics.

(b) Determine the forward voltage and forward current for the diode in Figure Q#1(b) for each of the diode models. Also find the voltage across the limiting resistor in each case. Assume $r'_d = 20\ \Omega$ at the determined value of forward current.

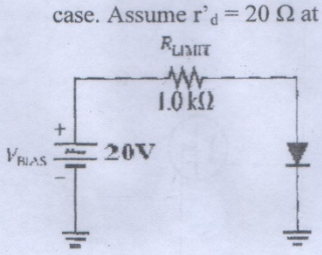

Figure Q#1(b)

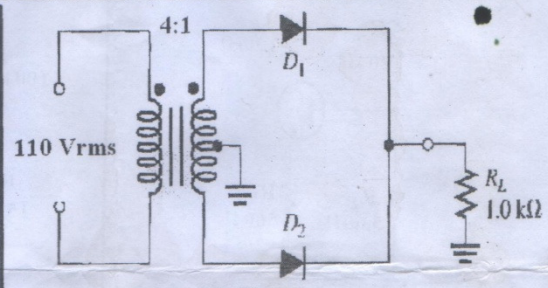

Figure Q#2(b)

2. (a) What is rectification? Explain working of a full wave bridge rectifier circuit with the help of input and output waveforms.

(b) Assume practical models of silicon diodes in the circuit shown in Figure Q#2(b) and
(a) What type of circuit is this?
(b) What is the total peak secondary voltage?
(c) Find the peak voltage across each half of the secondary.
(d) Sketch the voltage waveform across R_L
(e) What is average value of voltage across R_L?
(f) What is the PIV for each diode?

3. (a) What is a Bipolar Junction transistor? Explain different regions of its operation with the help of output V-I characteristics. Also define DC load lines.

(b) For the circuit shown in Figure Q#3(b), calculate I_B, I_C, I_E, V_{BE}, V_{CB} and V_{CE}. Also state whether or not the transistor is saturated.

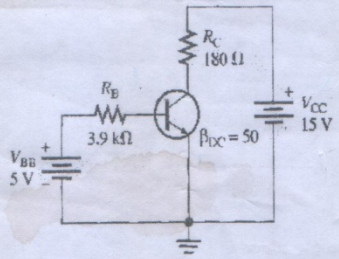

Figure Q#3(b)

Cont'd on P/-2...

4. (a) How a JFET differs from a BJT? With the help of diagrams explain construction and working of an n-channel JFET.

(b) In a self bias JFET, the operating point is to be set at I_D = 2mA and V_{DS} = 16V. The JFET parameters are I_{DSS}=6mA, V_P =3V. Find the value of R_S and R_D when V_{DD}=22V.

5. (a) What is transistor biasing? Enlist different methods for BJT biasing and explain voltage divider bias.

(b) Determine V_{CE} and I_C in the voltage-divider biased transistor circuit of Figure Q#5(b) if β_{DC} = 150.

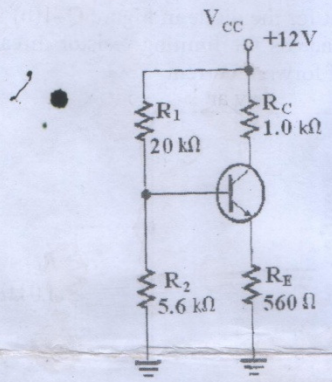

Figure Q#5(b)

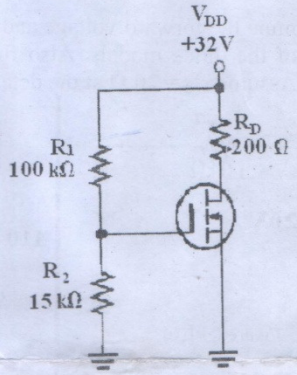

Figure Q#6(b)

6. (a) What is a MOSFET? How a D-MOSFET differs from JFET and E-MOSFET? Draw and explain its transfer characteristics.

(b) Determine V_{GS} and V_{DS} for the E-MOSFET circuit in Figure Q#6(b). Assume this MOSFET has minimum values of I_{DSS} = 200 mA at V_{GS} = 5V and $V_{GS(th)}$ = 3V.

7. (a) What is a regulated power supply? Give types of voltage regulators and explain working of a transistor series regulator.

(b) What are passive filters? How are these different from passive filters? Explain working of a low pass passive filter.

8. Write notes on the following

(i) Tunnel diode

(ii) UJT

(iii) SCR

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