

Model Question Paper.

Session: 2008-09

EEEC-101

Electronics Engineering

Section-A

Attempt all the questions. Multiple choice objective, fill in the blanks, True/False type Questions.

1x20 = 20.

Q1. A P-N junction diode's dynamic conductance is directly proportional to

a) the applied voltage. c) the current
b) the temperature d) the thermal voltage.

2. Zener diodes are used primarily as

a) rectifier c) oscillators
b) voltage regulators d) amplifiers.

3. Which stage of a dc power supply uses a ^{capacitor} ~~resistor~~ as the main component _____.

4. The dc output polarity from a half-wave rectifier can be reversed by reversing the diode T/F.

5. Without a dc source, a clipper acts like a

a) rectifier c) demodulator
b) clamper d) clipper

6. The emitter of a transistor is generally doped the heaviest because it

a) has to dissipate maximum power

- b) has to supply the charge carriers.
- c) is the first region of the transistor.
- d) must possess low resistance.

7. Base region is of high resistivity material which is only lightly doped. TIF

8. The following relationships between α and β are correct except.

a) $\beta = \frac{\alpha}{1-\alpha}$

b) $\alpha = \frac{\beta}{1-\beta}$

c) $\alpha = \frac{\beta}{1+\beta}$

d) $1-\alpha = \frac{1}{1+\beta}$

9. When a BJT is in saturation, I_c has positive ^{value} and $V_{CE} = \underline{\hspace{2cm}}$.

10. For small values of drain-to-source voltage, JFET behaves like a

- a) resistor
- b) constant-current source
- c) constant-voltage source
- d) negative resistance.

11. The drain source voltage at which drain current becomes nearly constant is called

- a) barrier voltage.
- b) breakdown voltage.
- c) pick-off voltage.
- d) pinch-off voltage.

12. The extremely high input impedance of a MOSFET is primarily due to the

- a) absence of its channel
- b) negative gate-source voltage
- c) depletion of current carriers
- d) extremely small leakage current of its gate capacitor

13. In an inverting amplifier, the two input terminals of an ideal OP-AMP are at the same potential because

- a) the two input terminals are directly shorted internally
- b) the input impedance of the OP-AMP is infinity.
- c) Common-mode rejection ratio is infinite.
- d) the open-loop gain of the OP-AMP is infinite.

14. Which of the following 4-bit combinations is/are invalid in the BCD code?

- a) 1010
- b) 0010
- c) 0101
- d) 1000

15. While obtaining minimal sum-of-products expression,

- a) all don't cares are ignored
- b) all don't cares are treated as logic 1s
- c) all don't cares are treated as logic 0s
- d) only such don't cares that aid minimization are treated as logic 1s

16. The first person who used Boolean algebra for the design of relay switching circuits was _____.
17. A multimeter is used to measure
- a) resistance
 - b) current
 - c) voltage
 - d) all of the above
18. In a $3\frac{1}{2}$ digit voltmeter, the largest number that can be read is
- a) 0999
 - b) 1999
 - c) 4999
 - d) 9999
19. The deflection sensitivity of a CRT depends inversely on the
- a) length of the vertical deflecting plates.
 - b) distance between screen and deflecting plates.
 - c) deflecting voltage.
 - d) separation between Y-plates.
20. A dual-trace CRO has _____ electron gun and _____ two pole switch.

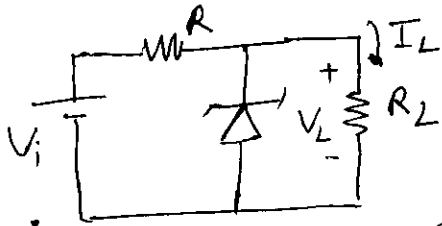
- Answers.
- 1) a
 - 2) b ~~resistor~~ ^{filter}
 - 3) ~~resistor~~
 - 4) true
 - 5) a
 - 6) a
 - 7) true
 - 8) b
 - 9) zero
 - 10) a
 - 11) d
 - 12) d
 - 13) b
 - 14) a
 - 15) d
 - 16) Shannon
 - 17) d
 - 18) a
 - 19) d
 - 20) one, one, one.

SECTION B

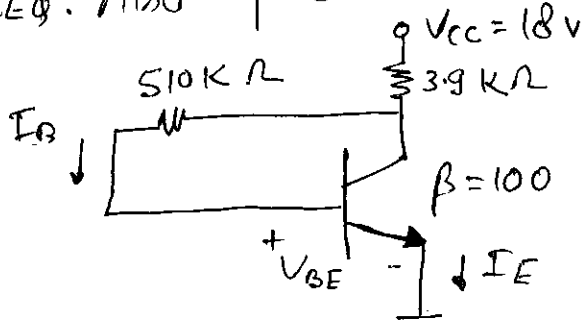
Attempt any three part.

Q1. A full wave bridge rectifier with a 100V rms sinusoidal input has a load resistor of $2.2\text{ k}\Omega$. Find

- (a) d.c output voltage
- (b) PIV rating of each diode.
- (c) Maximum current through each diode
- (d) Required power rating of each diode.

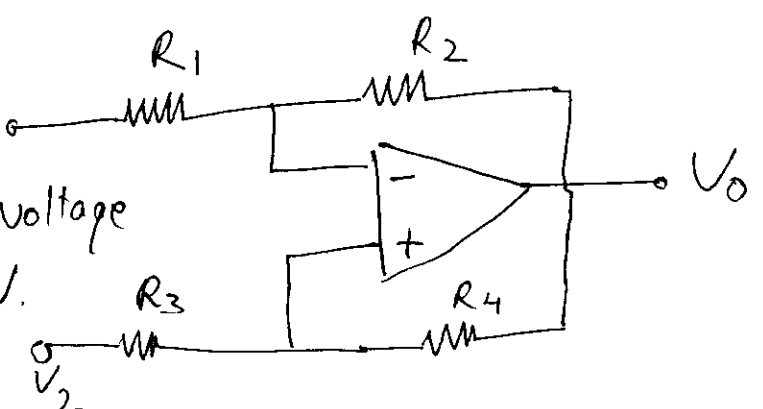
Q2.  The Zener diode shown in fig. have $V_Z = 50\text{ V}$ for $I_{Z\text{min}} = 5\text{ mA}$ and $I_{Z\text{max}} = 50\text{ mA}$. The supply voltage $V_i = 200\text{ V}$. Calculate R to allow voltage regulation from load current $I_L = 0$ to $I_{L\text{max}}$. Find $I_{L\text{max}}$.

Q3. For the biasing arrangement shown in fig., calculate I_{CQ} and V_{CEQ} . Also find node voltages V_B , V_C & V_E .



Q4. Discuss & draw the transfer characteristics of p-channel depletion type MOSFET.

Q5. For the difference amplifier shown, $R_2 = R_4 = 22\text{ k}\Omega$ and $R_1 = R_3 = 9.1\text{ k}\Omega$. Find the output voltage V_o , if $V_1 = 0.25\text{ V}$ & $V_2 = 0.05\text{ V}$.



SECTION-C

Qus:-1, what do you mean by voltage multiplier. Explain Half wave voltage doubler and full wave voltage doubler.

Qus:-2 :- what is FET biasing. Explain fixed bias and Self bias circuit for JFET.

Qus:-3 :- A JFET amplifier with stabilized biasing circuit shown in figure has following parameter. —

$V_p = -2V$, $V_{DSS} = 5mA$, $R_L = 910\Omega$, $R_F = 2.29k\Omega$,
 $R_1 = 12M\Omega$, $R_2 = 8.57M\Omega$, $V_{DD} = 24V$.

Determine the value of drain current I_D at the operating point. Also verify that FET will operate in pinch-off region.

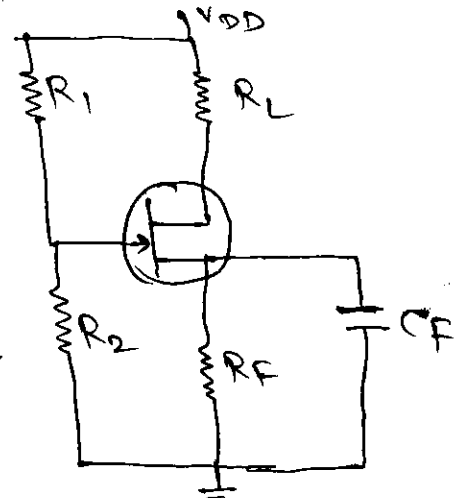


Fig. of Qus:-3

Qus:-4 Draw the block diagram of CRO and explain the function of each block and explain the working of CRO.

Qus:-5 Draw the block diagram of digital voltmeters and explain its working.

Qus:-6 Draw the Block diagram of digital multimeter (DMM) and explain its working.

Qus:-7 :- Simplify the following boolean function —

(a) ~~$Y = ABC + \bar{A}BC + A\bar{B}C + \bar{A}\bar{B}C$~~ $Y = \bar{A}BC + \bar{A}BC + \bar{A}BC + \bar{A}BC$

(b) $Y = AB + \bar{A}C + \bar{A}BC (AB + C)$

(c) $Y = \bar{A}BC + \bar{A}BC + \bar{A}BC + \bar{A}BC$

Qus:-8 :- Construct the circuit of integrator using operational amplifiers with required mathematical ~~integrate~~ expression.

~~Answer~~

Ques. 9

express the following function in a sum of minterms and a product of maxterms—

(a) $F(x, y, z) = 1$

(b) $F(A, B, C, D) = D(\bar{A} + B) + \bar{B}.D$

Ques. -10

:- What do you mean by α , β and γ . Derive relationship between them using Basic transistor current equations.