Printed Pages:6 | 1259 | EEC-101

(Following Paper ID and Roll No. to be filled in your Answer Book)

Paper ID : 131112 Roll No. ☐☐☐☐☐☐☐☐☐☐

B.TECH.

(SEM. I) THEORY EXAMINATION, 2015-16

ELECTRONICS ENGINEERING

[Time:3 hours] **[Total Marks:100]**

SECTION-A

1. Attempt **all** parts . All parts carry equal marks. Write answerof each part in short . (2x10=20)

(a) What dis depletion layer?

(b) Define peak inverse voltage of diode.

(c) State the difference between Unipolar and Bipolar device along with example.

(d) What is the use of common collector configuration?

(e) What are the differences between periodic and aperiodic signals?

(f) For a n-channel JFET with $r_o=10k\Omega$, $V_{GS}=-0V$, $V_p=6V$

Find out the resistance at $V_{GS}=-3V$.

(g) Draw the equivalent circuit of an operational amplifier and also state its characteristics?

(h) Convert the following numbers with indicated bases to decimal:

(i) $(4310)_5$
(ii) $(198)_{12}$

(i) Minimize the Boolean expression:(x+y)(x+y')

(j) What is slew rate?

SECTION-B

Attempt **any five** questions from this section. (10x5=50)

2. Explain the characteristics of p-n junction diode in forward and reverse bias.For the network of Fig1.,determine the range of R_L that will maintain V_l at 10 V and not exceed the maximum current rating of 32mA.

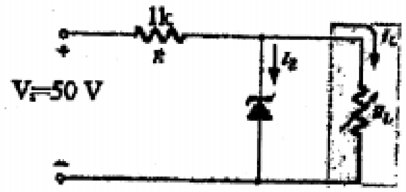

Fig. 1

3. Explain full wave voltage doubler. Determine V_o and the required PIV rating of each diode for the configuration of Fig.2.

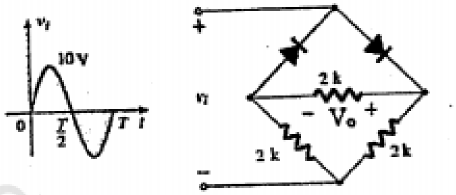

Fig. 2

4. Draw the input and output characteristics of Common Emitter npn transistor configuration with proper labels. For the circuit shown in Fig.3. find out I_B,I_C,V_C(β=120).

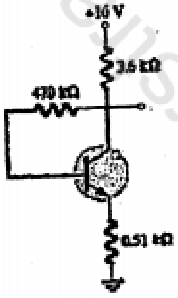

Fig. 3

5. Explain:
   - (i) Differentiator circuit using Op-Amp.
   - (ii) Non-Inverting amplifier using Op-Amp.

6. Explain the construction, working and characteristics of n channel depletion type MOSFET. Also derive expression fo g_m (transconductance) of JFET.

7. Explain the basic principle of digital voltmeter with the help of block diagram. What are the characteristics of DVM?

8. Why NAND and NOR gate are called universal gate, explain with example? Minimize $F(A,B,C,D)=\Sigma(0,2,3,5,7,8,10,11,14,15)$ using K-maps.

9. Draw and explain the working of a Bridge rectifier with input and output waveforms. Calculate efficiency and ripple factor.

SECTION-C

Attempt **any two** questions from this section. (15x2=30)

10. Explain the working of CRO and digital multimeter along with proper block diagram.

11. Determine and sketch Vo for the given network shown in Fig.4. Sketch Vo for the given network shown in Fig.5 for the input shown.

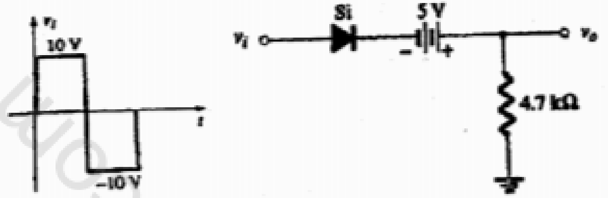

Fig. 4

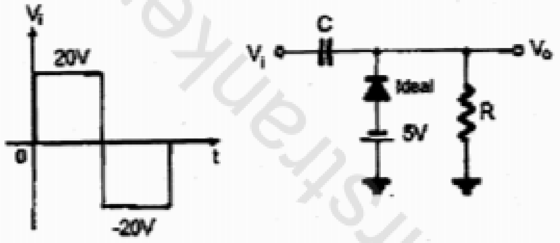

Fig. 5

12. Explain the construction and working of n-channel JFET. For the circuit shown in Fig.6 if, V_D=12V and V_{GSQ}=-2V, find value of Rs.

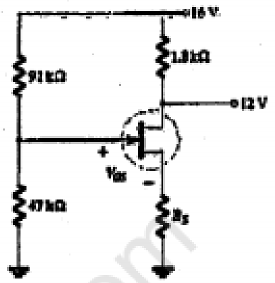

Fig. 6

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