Registration no: | | | | | | | | | | |

Total Number of Pages: 02

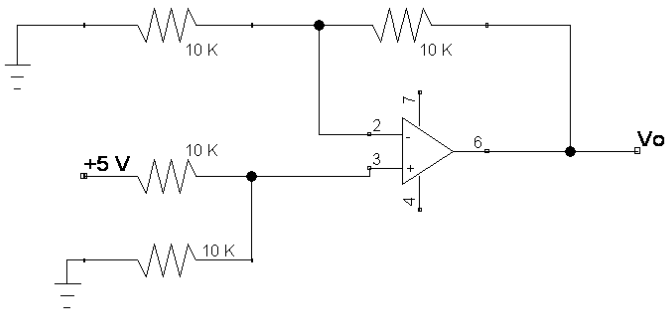
B.Tech
BE2101

1st Semester Back Examination 2016-17
BASIC ELECTRONICS
BRANCH: ALL
Time: 3 Hours
Max Marks: 70
Q.CODE: Y513

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

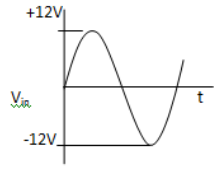
a) What do you mean by barrier potential across a P-N junction?
b) Discuss the advantages of negative feedback.
c) Differentiate between β_{ac} and β_{dc}.
d) Explain virtual ground concept in OPAMP.
e)

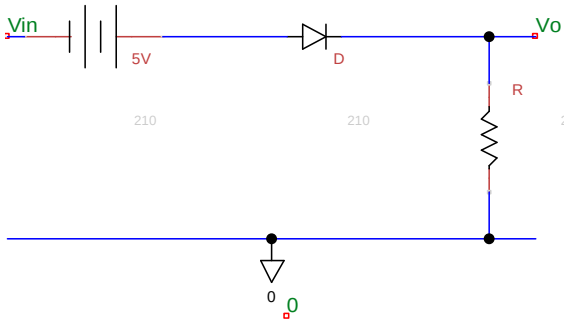


Find the output voltage Vo. Assume ±Vsat = ± 12 V for Op-amp.
f) Perform the following subtraction using 2's compliment method
$(18)_{10} - (29)_{10}$
g) What is the difference between a latch and a flip flop?
h) Mention the Barkhausen criteria of oscillation.
i) A Lissajous pattern on a CRO has six horizontal tangencies and two vertical tangencies. The frequency of the horizontal input waveform is 3 KHz. Find the frequency of the vertical input waveform.
j) Define noise margin of an inverter.

Q2 What is base width modulation effect? **(2+8)**
Mention its consequence on the input and output characteristics of common base and common emitter configuration.

Q3 **a)** **(5)**





Draw the output waveform V_o for the clipper circuit shown in the figure. Assume the diode to be ideal one.

b) What is the need of biasing in a transistor amplifier? Draw and explain the circuit of a voltage divider bias CE amplifier. **(5)**

Q4 **a)** Implement the following function using NAND gates only. **(5)**
$F(A,B,C,D) = A\,\overline{B} + \overline{A}\,B$

b) Implement the following function using multiplexor. **(5)**
$F(A,B,C) = \Sigma\, m(1,4,6,7)$

Q5 **a)** Draw and explain a basic integrator circuit using op-amp. What are its limitations and these are overcome? **(5)**

b) What is CMRR in an op-amp? What is its significance? **(5)**
The CMRR of an op-amp is 80 dB and the common mode gain is 0.5. Find the differential mode gain of the op-amp.

Q6 **a)** Explain how input impedance, output impedance, voltage gain and bandwidth changes when negative feedback is used in the amplifier circuit. **(5)**

b) A common emitter amplifier has a mid band frequency of 300. The upper and lower 3 dB frequency of the amplifier is 20KHz and 100 Hz respectively. A negative feedback of 10% is applied to the amplifier circuit. Find the new gain and bandwidth after feedback. **(5)**

Q7 With the help of block diagram showing essential components explain the working of CRO. **(10)**

Q8 **Write short answer on any TWO:** **(5 x 2)**

a) Zener breakdown

b) Instrumentation amplifier

c) Differentiate between static and dynamic RAM.

d) RC phase shift oscillator