

Printed Pages: 02

Subject Code: REC501

Paper Id:

130506

Roll No:

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BTECH
(SEM V) THEORY EXAMINATION 2018-19
INTEGRATED CIRCUITS

Time: 3 Hours

Total Marks:70

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

SECTION – A

1. Attempt all the questions:

7 x 2 =14

- (a) What is full power bandwidth?
- (b) How the effect of input bias current in non-inverting amplifier is compensated?
- (c) Write the advantage of active filter over passive filter.
- (d) What is PDN and PUN?
- (e) Write the advantage of a voltage follower circuit.
- (f) What is the advantage of precision diode rectifier circuit over ordinary rectifier?
- (g) An 8 bit DAC has an input of 10011011 and 10V reference, Find the corresponding output voltage.

SECTION – B

2. Attempt any three questions of the following questions:

3 x 7 = 21

- (a) Discuss wilson current mirror and widlar current source. What the advantage of widlar current source over wilson current mirror?
- (b) Classify active filter. Design second order low pass filter with $f_H = 2\text{KHz}$ and passband gain of 3.
- (c) (i) Sketch the CMOS logic circuit realization of the expression
$$Y = \overline{A(B + C)} + \overline{DE}.$$

(ii) Draw the D flip flop using CMOS.
- (d) Write short note on the following:
 - (i) Analog multiplier.
 - (ii) Logarithmic amplifier.
- (e) (i) Draw the function block diagram of IC 555 and explain its working.
(ii) Write a short note on Ex-OR as a phase detector.

SECTION – C

- 3. Attempt any one question: 1X 7 = 7**
- (a) (i) How the short circuit protection is achieved in the output stage of 741 op-amp?
(ii) Draw and explain the frequency response of IC 741.
- (b) What do you understand by the base current mirror. How does it provide improvement over simple current mirror circuit? Explain with the help of a neat circuit diagram
- 4. Attempt any one question: 1X 7 = 7**
- (a) Design a wide bandpass filter with $f_L = 500\text{Hz}$ and $f_H = 1500\text{Hz}$ and passband gain of 5, draw the frequency response of the filter and find value of Q.
- (b) Draw and explain I-V and V-I converters and derive its output.
- 5. Attempt any one question: 1 X 7 = 7**
- (a) Give CMOS implementation of a clocked SR flip-flop and explain its working.
- (b) Derive the formula for V_{IL} and V_{IH} of CMOS inverter.
- 6. Attempt any one question: 1X 7 = 7**
- (a) (i) Describe the schmitt trigger with help of proper circuit diagram and transfer characteristics.
(ii) Explain the working of peak detectors.
- (b) Draw the circuit diagram of full wave precision rectifier and find expression for output voltage for both positive and negative half cycle of input sinusoidal waveform.
- 7. Attempt any one question: 1X 7 = 7**
- (a) Draw the functional block diagram of IC 555 and explain its working. Draw the circuit diagram of a monostable multivibrator using 555 and find expression for quasi state period.
- (b) (i) Write short note on analog to digital converter.
(ii) Explain the working of PLL with suitable block diagram.

REC501 CORRECTION E 15.12.18

Kindly OMIT following from question 7(a)

"Draw the functional block diagram of IC 555 and explain its working."