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Paper Id: 3025

Sub Code: EEC 309

Roll No. | | | | | | | | | | |

B.TECH
(SEM III) THEORY EXAMINATION 2017-18
ANALOG AND DIGITAL ELECTRONICS

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x10 = 20

a) Explain the operation of Schottky diode.
b) What is photo diode? How it is different from a light emitting diode?
c) Write the properties of negative feedback.
d) Explain Amplifier transfer function.
e) Describe the basic principle of an oscillator circuit.
f) What are Crystal oscillators?
g) Differentiate between a latch and flip-flop.
h) Define Mod-N Counters. What does 'N' signify?
i) Compare the features of RAM and ROM. List different types of RAM/ROM.
j) Explain the function of Schmitt trigger.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a) Explain how a transistor can be used as a switch. What modification in the doping levels of various regions is required?
b) Explain the basic principle of feedback amplifiers. Explain the circuits for series-series, series-shunt, shunt-series and shunt-shunt feedback amplifiers.
c) Explain the principle of a sinusoidal oscillator. Describe the advantages of a crystal oscillator.
d) Explain the basic principle of shift registers. Describe the functioning of a Universal Shift register as PIPO, SISO.
e) Discuss the various types of Analog to Digital convertors and Digital to Analog Convertors.

SECTION C

3. Attempt any *two* parts of the following: 5 x 2 = 10

a) What is a Varactor diode? Draw and describe its characteristics.
b) Explain the construction of a tunnel diode. Explain tunneling effect?
c) Explain the construction and principle of operation of LED. Give the applications of LED.

4. Attempt any *one* part of the following: 10 x 1 = 10

a) Explain the low frequency response of common emitter configuration. Explain the functions of coupling and bypass capacitors.
b) Explain the difference between negative feedback and positive feedback. Describe the advantages of negative feedback. Mention applications of the positive feedback.

5. Attempt any *two* parts of the following: 5 x 2 = 10

a) What are tuned oscillators? Explain the differences between Collpit and Hartley oscillators.
b) What is a phase shift oscillator? Derive the expression for the phase shift provided by an RC phase shift oscillator.
c) Explain the working of a Wein Bridge oscillator. Calculate the oscillator frequency and loop gain.

6. Attempt any *one* part of the following: 10 x 1 = 10

a) Implement a 16:1 MUX using 2:1 Multiplexers.
b) Explain the difference between ring counter and Johnson counter with a suitable diagram. Also draw the waveforms for the output of a Johnson counter.

7. Attempt any *one* part of the following: 10 x 1 = 10

a) (i) Differentiate between Astable, Monostable and Bistable multivibrators.
(ii) Describe the features and applications of Timer IC- 555.
b) Define voltage regulation. Distinguish between the series, shunt and switching voltage regulators. Which of this configuration has the best voltage regulation? Justify your answer.