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14ELN15/25

First / Second Semester B.E. Degree Examination, June / July 2015
Basic Electronics

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, selecting ONE question from each part.*

PART - A

1 a. Draw and explain V — I characteristics of a Germanium Diode. (05 Marks)

b. Find the value of the series resistance R, required to drive a forty "'anent of 1.25mA through a Germanium diode from a 4.5V battery. Write the circuittpagram showing all the value. (04 Marks)

c. With neat diagram, explain the working of a half wave Fier along with relevant waveforms. (07 Marks)

d. Discuss in brief clipping circuit. Explain the working o ositive clipper with neat circuit diagram and relevant waveforms. (04 Marks)

2 a. Explain the working of a full wave rectifier 2 diodes with neat diagram. Also derive the expressions for Id_e and $I_{...}$ of a full wave,, ier. (10 Marks)

b. Discuss in brief clamping circuit. Explain)voildng of a negative damper. (04 Marks)

c. Distinguish between Zener and Avalapehe breakdown. (06 Marks)

PART -B

3 a. Calculate the value of Io, IE anc for a transistor with $ad_c = 0.98$ and IB = 1201.A. (06 Marks)

b. For the base bias circuit — 18V, R_t = 2.2KC1 „ RB = 470k0 , hf_e = 100 and VBE = 0.7V. Find IB, I_C and VcE. Dry e DC load line and indicate the Q point. (08 Marks)

Discuss the ideal chtrra eristics of an operational amplifier. (06 Marks)

a. Explain the voltage follower circuit using operational amplifier. Mention its important properties. (05 Marks)

b. Design an adder circuit using Op — amp to obtain a n output voltage of Vo = 2[0.1 V_1 + 0.5V2 + 2V31, where VI, V2 and V3 are input voltages. Draw the circuit (08 Marks)

c. 4:11Mign a voltage divider bias circuit to operate from a 12V supply with VcE = 3V, VE = 5V nd IC = 1111A, VBE = 0.7V. (07 Marks)

PART - C

a. With the help of a diode switching circuit and truth table explain the operation of an AND gate and OR gate. (06 Marks)

b. State and prove Demorgan's theorem for three variables. (06 Marks)

c. With truth table and logical expressions, give the design of a full adder circuit. Realize the circuit using i) Basic gates and ii) NAND gates. (08 Marks)

6 a. Perform the following conversions :

i) (1234.56)8 = (?)la ii) (10110101001.101011)2= (?)16 iii) (988.86)10 = (?)2

iv) (532.65)i0 = (?)I6 v) (ABCD.EF)H = (?)s• (05 Marks)

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b. i) Subtract (1000.01)2 from (1011.10)2 using l's and 2's complement method.
ii) Add (7AB.67)16 with (15C.71)16. (05 Marks)
c. Design a half adder circuit and realize using Basic gates and NAND gates. (05 Marks)
d. What are Universal gates? Realise AND and OR gate using Universal gates. (05 Marks)

PART - D

7 a. Distinguish between a Latch and flipflop. (04 Marks)
b. Explain i) See beck effect ii) Peltier effect and iii) Thomson effect. (06 Marks)
c. Explain the architecture of 8085 microprocessor, with neat diagram. (10 Marks)

8 a. Explain the working of a LVDT with neat diagram. (06 Marks)
b. List the difference between a microprocessor and micro controller. (08 Marks)
c. Explain the working of a R — S flipflop with relevant circuit and able. (06 Marks)

PART -E

9 a. What is Modulation? Mention some of the need for modulation in communication system. (06 Marks)
b. Give the comparison between AM and FM. (08 Marks)
c. With block diagram, explain the working of a cellular mobile communi system. (06 Marks)

10 a. Define Amplitude modulation and derive the exp sio for AM wave with relevant waveforms. Draw the frequency spec €91 (08 Marks)
b. With neat diagram, explain the w g of a telephone system. (06 Marks)
c. An audio frequency signal 10 x 500)t is used to amplitude modulate a carrier of 50 sin(2E x 10^5t). Calculate
i) Modulation index. ?-
Sideband frequencieei·'
iii) Band width. „AS'
iv) Amplitude of eablisideband.
v) Total power delivered to a load of 60052.
vi) Transmi 'on efficiency. (06 Marks)

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