CBCS Scheme

USN | | | | | | | | | |

15ELN15/25

First/Second Semester B.E. Degree Examination, Dec.2016/Jan.2017
Basic Electronics

Time: 3 hrs. Max. Marks: 80

Note: *Answer FIVE full questions, choosing one full question from each module.*

Module-1

1 a. Define the following diode parameters : **(05 Marks)**
   i) Knee voltage
   ii) Maximum forward current
   iii) Peak inverse voltage
   iv) Reverse breakdown voltage
   v) Maximum power rating. **(06 Marks)**

b. With neat circuit diagram and waveform explain the working of Full wave Bridge Rectifier.

c. Draw common emitter circuit. Sketch input and output characteristics. Also explain operating regions by indicating them on characteristic curve. **(05 Marks)**

OR

2 a. Write a note on voltage regulator circuit. **(05 Marks)**

b. Derive the relationship between α and β. Also calculate the α value and β value of a transistor if $I_B = 100\mu A$ and $I_c = 2mA$. **(04 Marks)**

c. With a neat diagram, explain the output characteristics of a transistor in common base configuration. **(07 Marks)**

Module-2

3 a. What is DC load line? Explain with neat circuit the operation of voltage divider bias circuit. **(05 Marks)**

b. What is op-amp? List the characteristics of an ideal op-amp. **(06 Marks)**

c. For the circuit shown in Fig Q3(c). compute
   i) Three transistor currents
   ii) Voltage drop across R_C and R_B. **(05 Marks)**

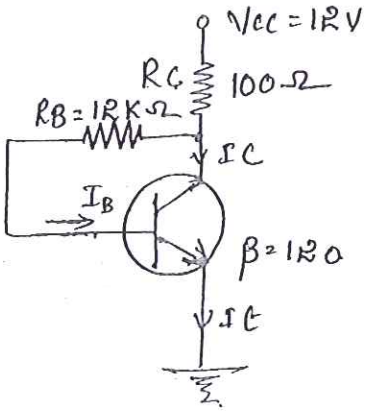

Fig Q3(b)

OR

4 a. Explain how op-amp can be used as
i) An integrator ii) Differentiator iii) Voltage follower. **(06 Marks)**

b. With neat circuit diagram, explain base biased method with necessary equations. **(05 Marks)**

c. Find the output of the following op-amp circuit. **(05 Marks)**

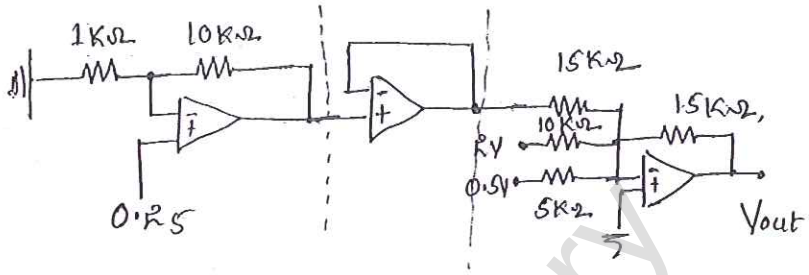

Fig Q4(c)

Module-3

5 a. Convert $(1101101)_2 = (\ )_{10}$ and $(96)_{10} = (\ )_2$. **(04 Marks)**

b. Convert $(FA876)_{16} = (\ )_8$ and $(237)_8 = (\ )_{16}$. **(04 Marks)**

c. Design Full adder circuit. **(08 Marks)**

OR

6 a. State and prove De Morgan's theorem. **(05 Marks)**

b. What are Universal gates? Realize AND, OR Gates using Universal gates. **(05 Marks)**

c. Subtract $(19)_{10}$ from $(15)_{10}$ using 1s and 2s compliment methods. **(06 Marks)**

Module-4

7 a. Write a note on NOR gate latch. **(05 Marks)**

b. Explain the working of clocked RS flip flop using NAND gates. **(06 Marks)**

c. Define microcontrollers. Write their important applications. **(05 Marks)**

OR

8 a. Explain the architecture of 8051 micro controller. **(08 Marks)**

b. Mention the difference between latch and Flip flop. **(02 Marks)**

c. Write a note on interfacing of 8051 microcontroller with stepper motor. **(06 Marks)**

Module-5

9 a. Explain the block diagram of communication system. **(05 Marks)**

b. Define Amplitude modulation. Derive mathematical expression for the same. Draw waveforms. **(06 Marks)**

c. Explain the construction and the principle of operation of LVDT. **(05 Marks)**

OR

10 a. List the differences between Amplitude modulation and frequency modulation. **(05 Marks)**

b. Explain frequency modulation with neat waveforms. **(05 Marks)**

c. A carrier of 10V peak and frequency 100KHz is amplitude modulated by a sine wave of 4V peak and frequency 1000Hz. Determine the modulation index for the modulated wave and draw the amplitude spectrum. **(06 Marks)**

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