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. **(05 Marks)**

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

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)**

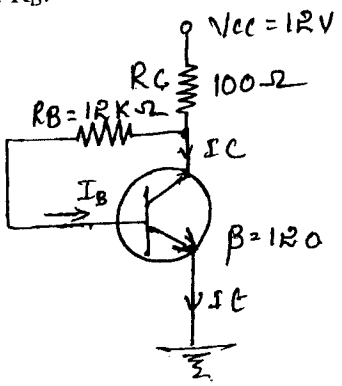

Fig Q3(b)

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)**

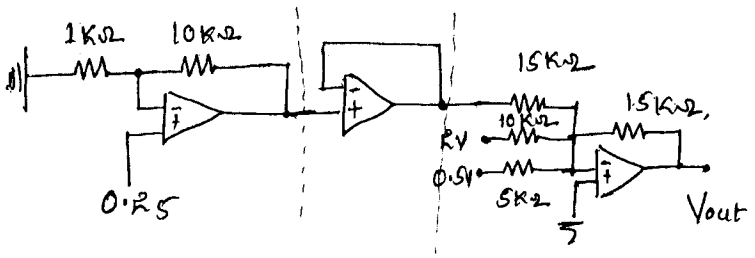

Fig Q4(c)

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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