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F.Y. B.Sc. (Computer science)
ELECTRONIC SCIENCE
ELC - 111 : Semiconductor Devices and Basic Electronic Systems (Backlog)
(CBCS) (2019 Pattern) (Semester - I) (Paper - I)

Time : 2 Hours]   *[Max. Marks : 35*

Instructions to the candidates:

    1)   *Q.1 is compulsory.*

    2)   *Solve any three questions from Q.2 to Q.5.*

    3)   *Questions 2 to 5 carry equal marks.*

    4)   *Draw neat labeled diagrams wherever necessary.*

Q1)   Solve any five of the following :   **[5 × 1 = 5]**

    a)   Draw symbols for :

        i)   LED

        ii)   Zener diode

    b)   What is piezoelectric effect?

    c)   State types of MOSFET.

    d)   Define knee voltage.

    e)   "IC 555 astable multivibrator is used as a clock" _ state true or false.

    f)   What is output voltage of IC 7805?

Q2)   Answer the following :

    a)   Explain construction and working of opto coupler.   **[4]**

    b)   Explain working of transistor as a switch.   **[3]**

    c)   Draw block diagram of SMPS and explain its operation in brief.   **[3]**

Q3)   Answer the following :

    a)   Define the terms α, β an γ with reference to transistor. State the relationship between α and β.   **[4]**

P.T.O.

b) Draw diagram of full wave rectifier using two diodes with filter capacitor. Define ripple factor. **[3]**

c) Draw diagram of IC 555 timer. For $R_A = 8k\Omega$, $R_B = 4k\Omega$ and $C = 0.1\mu F$; calculate the output frequency. **[3]**

Q4) Answer the following :

a) Explain working of zener diode as a voltage regulator. **[4]**

b) State Barkhausen Criteria for sustained oscillations. Find output frequency of wien bridge oscillator **[3]**

if $R_1 = 1k\Omega$, $C = 0.22\mu f$;

c) Draw diagram of 2 bit flash ADC and explain its working. **[3]**

Q5) Attempt any four of the following : **[4 × 2.5 = 10]**

a) Explain need of Digital to Analog converter.

Draw diagram of R-2R ladder network.

b) Write a short note on crystal oscillator.

c) Explain how MOSFET works as a switch.

d) Draw block diagram of successive approximation ADC.

e) Write a short note on potential divider bias of transistor.

f) Draw block diagram of off - line UPS.

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