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Total Number of Pages: 02

M.Sc
MPYC205

2nd SEMESTER REGULAR / BACK EXAMINATION– 2016-17

Electronics

BRANCH(S): M.Sc.(AP)

Time: 3 Hours

Max Marks: 70

Q.CODE:Z1160

**Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.**

- Q1 Answer the following questions: (2 x 10)**
- a) Draw the wave forms generated by an astable multivibrator.
 - b) Convert $(59.4375)_{10}$ into binary.
 - c) Reduce the Boolean function i.e. $A + \bar{A}B + AB$.
 - d) A Wien bridge oscillator is to cover a frequency range from 20Hz to 20kHz. The variable capacitance has a value from 30pF to 300pF. Calculate the resistance value required to cover the frequency range
 - e) Write the truth table for NAND & NOR gates
 - f) The noise factor of an ideal amplifier expressed in db is
(i)0 (ii)1 (iii)0.1 (iv)10
 - g) What do you mean by bandwidth of an OP-amp?
 - h) How will you obtain NOT gate from NAND gate?
 - i) What are the modes of propagations of radio wave in ionosphere?
 - j) Define numerical aperture of an optical fiber.
- Q2**
- a) Draw the circuit of a two stage RC Coupled amplifier. Draw its exact equivalent circuit diagram and show how that is modified for low, high and mid frequencies **(6)**
 - b) Explain how negative feedback can increase the value of bandwidth in an amplifier. **(4)**
- Q3**
- a) Draw the circuit diagram of phase shift oscillator and explain its operation by deriving expression for frequency of oscillation **(5)**
 - b) A phase shift oscillator using PNP transistor has the following circuit constants. **(5)**
 $V_{cc} = -10\text{Volts}$, $R_1=R_2=R_3=3.2\text{k}\Omega$, $R_L=10\text{k}\Omega$, $C_1=C_2=C_3=0.02\mu\text{f}$ calculate the current and frequency of oscillations.
- Q4**
- a) Describe the function of an OP-AMP as (i) an adder (ii) an integrator and (iii) a differentiator **(6)**
 - b) What is a bistable circuit? Discuss the operation of transistor bistable multivibrator. **(4)**

- Q5** a) Describe J-K flip flop and master slave J-K flip flop. Describe its merits over clocked R.S flip flops (6)
- b) The a.c. equivalent circuit of a crystal has the values:
 $L=1\text{H}$, $C=0.01\text{pF}$, $R=1000\Omega$ and $C_M=20\text{pF}$. Calculate f_s and f_p of the crystal. (4)
- Q6** a) How the use of Schottky diodes impart high speed of operation to transistors in Schottky TTL. Explain the operation of Schottky TTL (6)
- b) Define critical frequency and maximum usable frequency in radio wave propagation (4)
- Q7** a) What is radio wave? How does electromagnetic radiation occur and how the energy travels from antenna in the forms of radio wave types of antenna. (7)
- b) What are the various types of optical fiber? (3)
- Q8** a) What are the different types of antenna? With proper block diagram describe Super heterodyne (8)
- b) Draw the block diagram of optical communication system (2)