Registration No :

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M.Sc
16MPYC205

2nd Semester Back Examination 2018-19
ELECTRONICS
BRANCH : M.Sc(AP)
Time : 3 Hours
Max Marks : 70
Q.CODE : F656
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) How can NAND gate be used as a universal gate?
  b) What is the criterion for effective oscillation?
  c) Differentiate positive and negative feedback in an oscillatory circuit.
  d) Define numerical aperture and acceptance angle for an optical fiber.
  e) Enumerate the uses of the key elements of a radio communication system.
  f) Define thermal noise in transistors.
  g) What is meant by static characteristics of a JFET? Plot the characteristic graph.
  h) What is meant by a radio receiver? What are the types of radio receivers used?
  i) Simplify the Boolean identity: $A + \bar{A}B$
  j) Determine the voltage gain for differential mode input signal of an OPAMP with A_{cm} = 500 and CMRR =100.

Q2 **a)** Using basic logic gates create the XNOR gate. Verify the truth table from the circuit. **(5)**
  b) Discuss the working of RS flip flop. What are its advantages and disadvantages? **(5)**

Q3 **a)** Describe the working of an OPAMP as a non-inverting comparator with a positive reference voltage of 1 V and with a negative reference voltage of -1.5 V using an input signal with amplitude of 4V. **(5)**
  b) With proper circuit diagram describe the working of an OPAMP as adder, differentiator and integrator. **(5)**

Q4 **a)** Discuss the working of crystal controlled oscillator. **(5)**
  b) Derive the expression for mid-frequency voltage gain of RC coupled amplifier. **(5)**

Q5 **a)** Simplify the Boolean expression: $BC + \bar{B}D + CD$. Draw the logic circuit for the original given expression and for the simplified expression. **(5)**
  b) A Wien-bridge oscillator is to span a range of frequencies from 30 Hz to 30 kHz. The variable capacitance can be changed from 50 pF to 500 pF. Find the resistances needed to span the frequency range. If the gain of the amplifier is 6, what must be the ratio of the resistances in the other arms of the bridge? **(5)**

Q6   Draw the circuit, discuss the working and derive the expression for frequency   **(10)**
of a Phase shift oscillator.

Q7   Discuss the influence of the ionosphere on the radio wave communication.   **(10)**

Q8   **Write short answer on any TWO :**   **(5 x 2)**
- **a)** Discuss the various types of antennas.
- **b)** Describe voltage series feedback and voltage shunt feedback.
- **c)** Discuss the various types of optical fibers.