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PBB-003-0493002 Seat No. _____

B. Sc. / M. Sc. (Applied Physics) (Sem. III) (CBCS) Examination

November / December - 2018

Applied Electronics : Paper - X

(New Course)

Faculty Code : 003

Subject Code : 0493002

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory

(2) Numbers in the right margin indicate marks

1 Attempt any **seven** short questions : (Two marks each) **14**

(1) Draw the symbol of given diodes

(a) Schottky diodes

(b) Photo diodes

(c) Thermistor

(d) Tunnel diodes.

(2) What are the essential differences between semiconductor diode and tunnel diode?

(3) What is photoconductive cell? Which materials are used for photoconductive cell?

(4) Draw the general block diagram of voltage regulators.

(5) What is Voltage regulation? Write the equation for voltage regulation.

(6) Sketch the block diagram of CRO.

(7) Write the Shockley's equation which relates the gate to source bias voltage and drain current in JFET.

(8) Give the name of different configurations of biasing in FET.

(9) Which gates are the universal gates? Write name with proper symbol.

(10) Write the advantages of digital systems compared to analog system.

2 (a) Write answers of any **two** : **10**

(1) Explain varicap (varactor) diode with an application.

(2) Write the basic construction and characteristics of tunnel diode.

(3) Discuss photodiode with its applications.

(4) Explain solar cell with necessary figures and diagram.

(b) Write answer of any **one** : **4**

(1) Describe basic operation of liquid crystal display.

(2) Draw the general structure of IR emitters and write the applications.

3 (a) Write answers of any **two** : **10**

(1) Explain theory and construction of Cathode Ray Tube.

(2) Describe Synchronization in CRO.

(3) Explain series voltage regulation with basic series regulator circuit

(4) Explain shunt voltage regulation with basic shunt regulator circuit.

(b) Write answer of any **one** : **4**

(1) Draw the block diagram of operation of delayed sweep.

(2) What is switching regulator? Draw the block diagram of three terminal voltage regulators.

4 (a) Write answers of any **two** : **10**

(1) Describe basic operation of Enhancement type MOSFET.

(2) Explain Fixed-bias configuration in FET.

(3) Give the difference between BJT and FET

(4) Explain voltage divider biasing in FET.

(b) Write answers of any **two** : **4**

(1) Sketch the basic construction of a P-channel depletion type MOSFET.

(2) Draw symbol of FET and MOSFET.

(3) State the effect of VGS on channel conductivity of n-channel JFET.

(4) Write at least two differences between JFET and MOSFET.

5 (a) Write answers of any **two** : **10**

(1) Explain AND, OR and NOT gates with truth table.

(2) Explain Master-Slave operation of a flip-flop.

(3) Give the difference between combinational logic circuit and sequential logic circuit.

(4) Convert the following numbers as required in each case.

(i) $(1234)_{10} = (?)_2$

(ii) $(603.23)_{10} = (?)_2$

(b) Write answer of any **one** : **4**

(1) What is binary half adder? Draw the circuit for it.

(2) Using K-map simplify the product sum form the function given by F (A, B, C, D) = π M (0, 6,10,12)