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RZ-003-001603 Seat No. _____

B. Sc. (Sem. VI) (CBCS) Examination

March - 2019

Physics : Paper - 603

(Old Course)

Faculty Code : 003
Subject Code : 001603

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

Instructions : (1) All questions are compulsory.

(2) Symbols have their usual meanings.

(3) Figures to the right indicate marks.

1 Answer the following in short : **20**

(1) A multivibrator which continuously switches from one state to another without applying input trigger pulse is called _____ multivibrator.

(2) Define integrating circuit.

(3) Write full form of SCR.

(4) Write full form of LDR.

(5) What is the number of circuits in a VLSI?

(6) Define monolithic IC.

(7) What is the full form of Op-Amp?

(8) An ideal Op-Amp has _____ bandwidth.

(9) Give the classification of ICs based on structure.

(10) The Op-Amp is a _____ controlled device.

(11) Define electrical transducers.

(12) Name any two nuclear transducers.

(13) Give the relation between temperature and resistance of a metallic wire.

(14) Give full form of LVDT.

(15) Define multiplexer.

(16) The _____ of the circuits is extremely reduced due to ICs.

(17) DIAC and TRIAC are unidirectional devices. True/False?

(18) Name two light activated thyristors,

(19) Define clipping circuits.

(20) Give the limitations of mechanical switch.

2 (A) Answer the following questions : (Any **Three**) **6**

(1) Write the conditions necessary for an integrating circuit.

(2) Explain the basic idea of a clamper.

(3) Name four triggering methods for a thyristor.

(4) Write four applications of thyristors.

(5) What is meant by a freewheeling diode?

(6) Draw the block diagram of a temperature controller circuit and explain.

(B) Answer the following questions : (Any **Three**) **9**

(1) Write advantages of electronic circuits.

(2) Explain with a neat diagram working of positive clipper.

(3) Give comparison between transistors and thyristors.

(4) Explain construction and working of DIAC.

(5) Explain with a neat diagram the working of OFF at dark circuit.

(6) Explain with a neat diagram the working of water level indicator circuit.

(C) Answer the following questions : (Any **Two**) **10**

(1) Explain how a transistor works as a switch.

(2) Explain astable multivibrator with neat circuit diagram.

(3) Explain two transistor analogy of SCR.

(4) Explain principle of operation and characteristics of SCR.

(5) Explain the working of light operated SCR alarm circuit.

3 (A) Answer the following questions : (Any **Three**) **6**

(1) Name the two methods used to produce thin film ICs.

(2) Give four disadvantages of monolithic ICs.

(3) Write the equation for capacitance of a capacitor.

(4) Explain tachometer with a neat diagram.

(5) Define sequential logic circuit.

(6) Draw a pin diagram of IC 555 timer.

(B) Answer the following questions : (Any **Three**) **9**

(1) Write the characteristics of an ideal op-amp.

(2) Explain the use of Op-amp as voltage comparator.

(3) Write a note on resistive pressure transducer.

(4) Explain strain gauge.

(5) A platinum wire with $R_0 = 100\Omega$ and $\alpha = 0.00385$ is kept in an environment at $100°C$. What is its resistance?

(6) Explain R-S flip flop with its truth table.

(C) Answer the following questions : (Any **Two**) **10**

(1) Explain how an NPN transistor is fabricated in monolithic structure.

(2) Explain the use of op-amp as an adder.

(3) Explain construction and working of LVDT.

(4) Explain construction and working of thermocouples.

(5) Draw a neat circuit diagram of an astable multivibrator using IC 555 and obtain expression for its frequency.
