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PH-003-001603 Seat No. _____

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

July - 2018

Physics - 603

(Solid State Electronics)

(New Course)

Faculty Code : 003

Subject Code : 001603

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

Instructions : (1) All questions are compulsory.

(2) Digit on the right side indicate marks.

(3) Symbols have their usual meaning.

1 Answer the questions : **20**

(1) When a transistor is driven to saturation, ideally the output is _____ V.

(2) _____ multivibrator is a square wave oscillator.

(3) If transistor is used as a switch, and if $V_{CC} = 10\,V$, $R_C = 1\,K\Omega$ and $I_{CBO} = 10\,\mu A$. when transistor is at cutoff, the value of V_{CE} near to _____ V.

(4) When transistor (in CE arrangement) is in the cutoff region, the collector current is _____.

(5) If 10 V dc is supplied to the input of differential circuit, its output will be _____.

(6) For the integrating circuit, the capacitive reactance X_C should be _____ than the resistance R.

(7) Input wave in integrating circuit is squarewave, its output will be _____.

(8) For the regenerative action of SCR, the value of $(\alpha_1 + \alpha_2)$ should be near to _____.

(9) The angle for which the device remains in conduction state is known as _____.

(10) LDR is not a Thyristor. True or false?

(11) For first quadrant characteristic of TRIAC, the terminal MT_1 is _____.

(12) _____ cannot fabricated in monolithic IC.

(13) An ideal OP–AMP is a _____ controlled device.

(14) In inverting amplifier for OP–AMP, the feedback resistance R_f is $10\,K\Omega$ and input resistance R_i is $1\,K\Omega$, find the voltage gain.

(15) In Op–Amp as differentiator, the feedback component is _____.

(16) In Strain gauge, strain is directly proportional to change in _____.

(17) In multiplexer, when $ABCD = 0000$, _____ data will be transmitted to output.

(18) In J–K flip–flop, if both input is 1, the action is _____.

(19) For flip–flop, outputs Q and $\overline{Q}$ should be _____.

(20) In SR flip-flop, if terminal S is '1', the action is called _____.

2 (A) Answer any **three** : **6**

(1) Write the advantages of electronics switches.

(2) How transistor can be use as a switch ? Explain in brief.

(3) In astable multivibrator, if $R_2 = R_3 = 10K\Omega$ and $C_1 = C_2 = 0.01\,\mu F$. Determine the time period and frequency of the output squarewave.

(4) Write down the list of the methods of triggering SCR.

(5) What is firing angle and conduction angle?

(6) Draw the circuit diagram of transistor astable multivibrator.

(7) Draw the layer diagram, symbol and characteristic curve of DIAC.

(B) Answer any **three** : **9**

(1) What is differentiating circuit ? Draw circuit diagram and prove the relation between output and input voltage.

(2) What is clipping circuit? Explain biased clipper.

(3) Explain multivibrator with proper block diagram.

(4) Explain differentiating circuit.

(5) Explain structure and operation of TRIAC.

(6) Explain 'Off at dark' circuit.

(C) Answer any **two** : **10**

(1) Explain transistor free running multivibrator.

(2) Explain switching action of a transistor.

(3) Explain two transistor analogy of SCR.

(4) Explain application of DIAC–TRIAC as a static switch.

(5) Discus illumination control circuit using DIAC–TRIAC.

3 (A) Answer any **three** : **6**

(1) What is an integrated circuit?

(2) Write the disadvantages of monolithic ICs.

(3) What is transducer? Explain it.

(4) What is the basic principle of self–generating inductive transducer?

(5) Draw logic diagram of basic RS flip–flop and realize the truth table.

(6) Draw logic diagram and give truth table of JK flip–flop.

(B) Answer any **three** : **9**

(1) What is an Op–Amp ? Explain.

(2) Explain Op–Amp as Adder.

(3) Explain Tachometer with proper diagram.

(4) Write a note on thin film IC.

(5) What is combinational and sequential logic circuits?

(6) Discuss D–flip–flop.

(C) Answer any **two** : **10**

(1) Explain use of Op–Amp as inverting amplifier.

(2) Explain strain gauge.

(3) Explain constructive and working of LVDT.

(4) Explain S–R flip flop with circuit diagram and realize truth table.

(5) Write a note on classification of transducer.
