RP-003-1015027 Seat No. _____

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

February - 2019

Physics : Paper - 503

(Solid State Electronics) (New Course)

Faculty Code : 003

Subject Code : 1015027

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

Instructions : (1) All the questions are compulsory.
(2) Figures on the right indicate full marks.
(3) Notations have their usual meaning.

1 (a) Fill in the blanks with proper answer : **4**

(1) 1 bel = _____ dB.

(2) _____ coupled amplifier is used for impedance matching.

(3) In class – A amplifier the conduction angle of collector current is _____.

(4) The metal sheet that serve to dissipate the additional heat from the power transistor is known as _____.

(b) Answer any **one** question : **2**

(1) The voltage gain of an amplifier is 100. Find its decibel gain.

(2) A power transistor working in class – A operation has zero signal power dissipation of 10W. If the AC output power is 4W, find the collector efficiency.

(c) Answer any **one** question : **3**

(1) Explain frequency response curve of transformer coupling amplifier.

(2) Explain thermal runaway.

(d) Answer any **one** question in detail : **5**

(1) Explain R-C coupled amplifier with neat diagram.

(2) Explain push-pull amplifier.

2 (a) Fill in the blanks with proper answer : 4

(1) Bistable Multivibrator is also known as _____.

(2) The Multivibrator which generates square wave of its own is known as _____.

(3) A circuit that can ON and OFF power to an electrical circuit is known as a _____.

(4) Monostable multivibrator is also known as _____.

(b) Answer any **one** question : 2

(1) Find the voltage across R, if input voltage with peak value of –12V is applied to a negative clipper (V_d = 0.7V).

(2) If time period of a wave T is 0.336×10^{-3} second, then find out the frequency of wave.

(c) Answer any **one** question : 3

(1) Explain thermal runaway.

(2) Explain complementary symmetry amplifier.

(d) Answer any **one** question in detail : 5

(1) Explain bistable multivibrator with neat circuit.

(2) Explain biased clipper.

3 (a) Fill in the blanks with proper answer : 4

(1) A zener diode utilizes _____ characteristic for voltage regulation.

(2) A zener diode regulator has low efficiency for _____.

(3) Full form of CMRR is _____.

(4) The ideal bandwidth of an Op-Amp is _____.

(b) Answer any **one** question : 2

(1) If the dc output voltage is 200V with no-load attached to power supply but decreases to a 150V at full-load, calculate the percentages voltage relation.

(2) Determine the voltage gain of non-inverting Op-Amp amplifier having $R_1 = 5\,K\Omega$ and $R_f = 500\,K\Omega$.

(c) Answer any **one** question : **3**

(1) Explain transistor series voltage regulator.

(2) Explain Op-Amp as voltage comparator.

(d) Answer any one question in detail : **5**

(1) Write a short note on series feedback voltage regulator.

(2) Explain an Op-Amp as differentiator.

4 (a) Fill in the blanks with proper answer : **4**

(1) LVDT has _____ primary but two secondary coils.

(2) Microphone is an _____ transducer.

(3) A thermocouple is a most widely sensor used to measure the _____.

(4) The relation between temperature and resistance of the metallic wire is given by _____.

(b) Answer any **one** question : **2**

(1) A wire strain gauge bonded to an iron member which is subjected to a strain of 10^{-7}. If strain resistance is $100\,\Omega$ and change in gauge resistance is $50\,\mu\Omega$, then calculate gauge factor.

(2) Draw only the figure of inductive pressure transducer.

(c) Answer any **one** question : **3**

(1) Explain resistive position transducer.

(2) Explain strain gauge.

(d) Answer any **one** question in detail : **5**

(1) Describe the carbon microphone.

(2) Write a note on classification of transducer.

5 (a) Fill in the blanks with proper answer : **4**

(1) Full form of CRT is _____.

(2) Full form of CRO is _____.

(3) Flip-flop can be used as a _____ device in computer.

(4) _____ flip-flop has only I input.

(b) Answer any **one** question : **2**

(1) Determine the output pulse width for the monostable 555 timer, when $R_A = 20\,K\Omega$ and $C = 0.1\,\mu F$.

(2) Determine the frequency of oscillation for the astable 555 timer for $R_A = R_B = 100\,K\Omega$ and C = 1000 PF.

(c) Answer any **one** question : **3**

(1) Explain analog and digital instruments.

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

(d) Answer any **one** question in detail : **5**

(1) Explain the rectifier type AC meter.

(2) Explain 1 of 16 decoder.
