



Shree H.N.Shukla group of colleges

PHYSICS

T.Y.B.Sc. (Sem. V) (CBCS)

Preliminary Examination

PAPER- 503

SOLID STATE ELECTRONICS

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 ($V_d = 0.7\text{V}$).
 - (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 $R_1 = 5\text{K}\Omega$ and $R_f = 500\text{K}\Omega$.

- (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.
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- 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 100Ω 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 1 input.
- (b) Answer any **one** question : 2
- (1) Determine the output pulse width for the monostable 555 timer, when $R_A = 20\text{ K}\Omega$ and $C = 0.1\text{ }\mu\text{F}$.
 - (2) Determine the frequency of oscillation for the astable 555 timer for $R_A = R_B = 100\text{ K}\Omega$ and $C = 1000\text{ PF}$.
- (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.
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