

12 APR 2019

Examination March - 2019

Seat No. _____

B.Sc SEM -06

PHYSICS : Paper - 603 Code : 21840

(OP-AMP, SOLID STATE ELECTRONICS, SUPERCONDUCTIVITY)

Time :2:30 Hours

Total Marks :70

Instruction : All questions carry equal marks.

સુચના : દરેક પ્રશ્નના ગુણ સરખા છે

MARKS

Que:1(A) What is called op-amp? Draw block diagram of op-amp and explain each block. 8

Que:1(B) Explain ideal voltage transfer curve 6

OR

Que:1(A) Explain non inverting amplifier and derive formula for voltage gain. 8

Que:1(B) Explain common mode rejection ratio. What is its importance? 6

Que:2(A) Explain summing amplifier in non inverting mode configuration. 8

Que:2(B) Explain differentiator amplifier. 6

OR

Que:2(A) Why input resistance of op amp is needed higher? Derive formula of input resistance for non-inverting amplifier. 8

Que:2(B) Explain current to voltage converter. 6

Que:3(A) Explain construction, working and characteristics of TRIAC. 7

Que:3(B) Explain construction, working and characteristics of Photo diode 7

OR

Que:3(A) Explain Bi-polar transistor as an AC and DC switch. 7

Que:3(B) Explain construction, working and characteristics of LED. 7

Que:4(A) Discuss BCS Theory of Superconductivity. 7

Que:4(B) Discuss the Isotope Effect of super-conductivity and its importance. 7

OR

Que:4(A) Discuss the effect of temperature and magnetic field on superconductivity. Discuss the same for hard superconductors. 7

Que:4(B) A superconducting tin has a critical temperature of 3.7 K in zero magnetic field and a critical field of 0.0306 T at zero K. Find the critical magnetic field (in CGS unit) at 1.5 K and critical temperature at 200 Gauss. 7

Que:5(A) Explain clocked S-R flip flop with truth table, diagram and logic symbol. 8

Que:5(B) Explain truth table, logic symbol and diagram for the gated S-R latch. 6

OR

Que:5(A) Explain active low S-R latch with diagram, logic symbol and truth table. 7

Que:5(B) Explain edge triggered D-flip flop with following details:(i) diagram, (ii) logic symbol, (iii) truth table. 7