BANAGA BANDHU SHEIKH MUJIBUR RAHMAN SCIENCE AND TECHNOLOGY UNIVERSITY
DEPT. OF COPMUTER SCIENCE AND ENGINEERING

MARKS: 70 APE204: Electrical and Electronic Circuit TIME: 4 Hr

Answer any three from each section on separate script marked A and B

Section-A

A1. a) Briefly explain how to prepare p-type and n-type semiconductors? 6
b) Explain how potential barrier is developed in general purpose diode. $5\frac{2}{3}$

A2. a) What do you mean by biasing? Sketch the internal distribution of charge under following forward and reverse biasing of a pn junction. 3
b) Define rectifier. Explain and construction and working of full wave bridge rectifier. Hence find its efficiency. $8\frac{2}{3}$

A3. a) What is transistor? Explain the operation of a transistor as an amplifier. 4
b) Define Amplification factor α. Show that it is always less than unity. Hence establish the relation $\beta = \frac{\alpha}{1-\alpha}$. 4
c) Explain the input and output characteristics of an npn transistor connected in common emitter (CE) configuration. $3\frac{2}{3}$

A4. a) What is transistor biasing? Why transistor biasing required? 2
b) Name various Method of transistor biasing. 2
c) Describe the potential divider biasing method in detail and find an expression for stability factor. $7\frac{2}{3}$

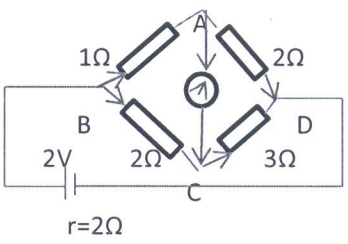
A5. a) Define and classify feedback. 2
b) What is an oscillator? Explain the construction and operation of a Hartley oscillator. $7\frac{2}{3}$
c) A certain collpitt oscillator uses a tank circuit with L=20mH, C_1=200pF and C_2=300pF. What is the frequency of oscillation? 2

Section B

B1 a) Define operational amplifier. Write the characteristics of an ideal op-amp. 3
b) Define slew rate and CMRR. Discuss the method of determination of CMRR of an op-amp. $5\frac{2}{3}$
c) Discuss op-amp as a voltage summing amplifier. 3

B2. a) Write notes (any two) $11\frac{2}{3}$
a) Avalanche breakdown
b) Differentiator
c) LED
d) p-n junction photo diode

B3. a) State and explain Norton theorem. 6
b) Determine the current in the unbalance bridge circuit shown below. Also determine the potential difference across BD and resistance from B to D. $5\frac{2}{3}$



B4 a) Define Thevenin's theorem and derive equations for Thevenin's resistance and voltage. 5
b) Define maximum power transfer theorem and deduce equation for it. $6\frac{2}{3}$

B5. a) What is filter? How many types of filter used in the world? 3
b) Define propagation constant, attenuation constant and phase constant. $4\frac{2}{3}$
c) Design a low pass filter having a cut of frequency f_c=100kHz and a design impedance of 500Ω. 4