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Model Question Paper-02

Khaja Bandanawaz University

Second Semester BE Degree Examination

Sub: Basic Electronics

Time:3 Hrs   **Max Marks:100**

Section-A

I.   Answer any TEN questions from the following.   (02 Marks each)

Q1. Write Two's compliment of $(11011100)_2$

Q2. What is binary number system.

Q3. What are universal gates.

Q4. What is PN junction diode?

Q5. What is Forward biasing and Reverse biasing of Diode?

Q6. What is Capacitor filter?

Q7. Define inverting and non inverting Op-AMP.

Q8. Define CMRR.

Q9. What is Summing amplifier?

Q10. Define Modulation.

Q11. What is modulation index?

Q12. What are the elements of Fiber optics?

Q13. What is Transducer?

Q14. Define Active and Passive Transducers.

Q15. What is Oscillator?

Section-B

II.   Answer FIVE full questions from the following.   (08 Marks each)

Q1. a. convert i) $(25.375)_{10}$ and ii) $(20E.CA)_{16}$ into binary Equivalent.

   b. Using NAND gates implement i) OR gate and ii) NOR gate

Q2. a. Explain with truth table and logic diagram Demorgan's theorem

   b. Simplify the following i) $Y=(B+CA)(C+AB)$ and ii) $Y=AB+AC+BD+CD$.

Q3. a. Explain with neat sketch V-I characteristics of PN junction diode.

   b. Define α_{dc} and β_{dc} and Establish a relationship between α_{dc} and $\beta_{dc.}$

Q4. a. Derive an expressions for average dc current and average dc voltage of Full wave rectifier

   b. A transistor has $\alpha=0.9$. If $I_E=10mA$, find the values of β , I_B and I_C.

Q5. a. Explain the importance of inverting and non-inverting amplifier

   b. Define the terms i) Differential Gain A_d and ii)   Slew Rate

Q6. a. List the various ideal op-amp characteristics

   b. The input to the basic differentiator circuit is a sinusoidal voltage of peak value of 10mV frequency 1.5KHZ. Find the output if, $Rf=100K\Omega$. and $C1=1\mu F$

Q7. a.   What is modulation. Explain need of modulation.

   b.   List the advantages and applications of optical Fiber communication.

Q8. a.   Explain principles of Trasduction.

   b. What is Barkhaunsens criteria for sustained oscillations.

Section-C

III.   Answer FOUR full questions from the following.   (10 Marks each)

Q1. a.   Design Full Adder and Implement it using two half adders.

   b.   Simplify $Y= AB+ AC+ABC (AB+ C)$. Implement the same using gates

Q2. a.   With a neat circuit diagram and waveform, explain the working of half-wave rectifier.

b. In a FWR with a capacitor filter, the load current from the circuit operating from 230V,50Hz supply is 10mA. Establish the value of capacitor required to keep the ripple factor less then 1%.

Q3. a. Draw common emitter circuit and sketch the input and output characteristics. Also explain operating regions by indicating them on characteristics curve.

b. In a Common Emitter transistor circuit if $\beta = 100$ and $I_B = 50\mu A$, compute the values of α, I_E and I_C

Q4. a. Draw internal block diagram of op-amp and mention the role of each stage

b. Explain how Op-Amp can be used as i) Integrator ii) Voltage Follower

Q5. a. Design an adder circuit using an op-amp to obtain an output voltage of Vo=-[2V1+3V2+5V3]

b. Draw the three input inverting summer circuit and derive an expression for its output voltage.

Q6. a. Draw and explain the block diagram of basic communication system.

b. With a neat block diagram explain the working of Optical Fiber Communication systems

Q7. a. With the help of circuit diagram explain the working of Wein Bridge oscillator.

b. Explain the Barkhausen criteria for oscillators with special reference to the condition Aß<1, Aß>1, Aß=1.