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## Faculty of Engineering and Technology

Second semester B.E. Degree Examination

Subject: - Basic Electronics [19KBELN15/25]

**Time: 3Hrs.**

**Max.Marks:100**

### **MODEL QUESTION PAPER-I**

#### **SECTION-A**

**I. Answer any TEN questions from the following.**

**(02Marks Each)**

Q.1) Perform the following.  $(110011)_2 = (?)_{10} = (?)_8$

Q.2) State De-Morgan's theorems.

Q.3) Realize OR gate using NAND gates only.

Q.4) Define the terms (i) Reverse break download voltage (ii) Peak Inverse Voltage.

Q.5) what is a Rectifier? Name the types.

Q.6) write the relationship between  $\alpha$  and  $\beta$  of a transistor.

Q.7) what is an operational amplifier? Why it is called so?

Q.8) Define CMRR. What is its ideal value?

Q.9) Define the terms of op-amp (i) Input bias current (ii) Input offset voltage.

Q.10) what is modulation? What is demodulation?

Q.11) Define modulation index for Amplitude Modulation.

Q.12) Define Frequency modulation.

Q.13) what is a transducer?

Q.14) what do you mean by active and passive transducer?

Q.15) Explain Barkhausen criteria for sustained oscillations.

### **SECTION-B**

**II. Answer any FIVE full questions from the following. (08 Marks Each)**

Q.1) (a) perform the binary subtraction using 1's complement representation.

(i)  $(28)_{10} - (19)_{10}$  (ii)  $(15)_{10} - (28)_{10}$  4M.

(b) State and prove Commutative and Associative law of Boolean algebra 4M.

Q.2) what is a Full-Adder? Design and implement a full adder using two half adders. 8M.

Q.3) Draw and explain the V-I characteristic of a p-n junction diode. 8M.

Q.4) Draw the common emitter circuit and sketch the output characteristics. Explain active, cut-off and saturation region by indicating them on the characteristic curve. 8M.

Q.5) Draw the internal block schematic of op-amp and mention the role of each stage. 8M.

Q.6) with the help of neat block diagram explain the elements of communication system 8M.

Q.7) with a neat block diagram explain the working of Optical Fiber Communication. 8M.

Q.8) (a) what are primary and secondary transducers? Explain. 4M.

(b) Explain the working of RC phase shift oscillator. 4M.

### **SECTION-C**

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

Q.1) what are universal gates? Why they are called so? Realize the basic gates using NAND and NOR gates only. 10M.

Q.2) (a) with the help of neat circuit diagram and necessary waveforms explain the working of bridge wave rectifier. 6M.

(b) Explain the principle of working of zener diode as a regulator. 4M.

Q.3) (a) A transistor amplifier connected in CE mode has  $\beta=100$  and  $I_B=50\mu A$ . compute the values of  $I_C$ ,  $I_E$  and  $\alpha$ . 4M.

(b) Explain the output characteristics of a transistor in CB mode. 6M.

Q.4) (a) Draw the circuit of an integrator and derive the expression for its output voltage. 5M.

(b) Design an inverting scaling adder circuit using op-amp to give the output

$V_o = -(3V_1 + 4V_2 + 5V_3)$  . Where  $V_1$ ,  $V_2$  and  $V_3$  are the input voltages. 5M.

Q.5) (a) Explain the need for Modulation. 6M.

(b) A 220 watts carrier is modulated to a depth of 50%. Calculate the total power. 4M.

Q.6) what are the advantages and applications of optical fiber communication. 10M.

Q.7) (a) Explain the working of LVDT. 5M.

(b) With a neat circuit diagram explain the working of Wein Bridge oscillator. 5M.

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