Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name:Analog Electronics Circuits

Subject Code: 4TE03AEC1 Branch: B.Tech(EEE,Electrical,IC)

Semester: 3 Date: 22/04/2016 Time: 2:30 To 5:30 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

1) For a full wave bridge rectifier circuit, ripple factor is_____

(A) 121 % (B) 85 % (C) 60 % (D) 48 %

2) A 6 V, 500 mW zener diode is used in a voltage regulator circuit. What will be maximum current rating for the zener diode?

(A)100 mA(B) 83.3 mA(C) 41.66 mA(D) 0 mA

3) For a transformer coupled class A power amplifier,if $\frac{V_{CC}^2}{R_C}$ is the ac output power and $\frac{V_{CC}^2}{2R_C}$ is the dc input power, what will be the efficiency of the circuit?

(A) 50%(B) 25 %(C) 100 %(D) 75 %

4) For a common emitter transistor amplifier, the controlling parameter is_____

(A) Collector current (B)Base current

(C) Collector-emitter voltage(D) Emitter current

5) In which of the following amplifier classes, BJT operates for whole of the input signal cycle?

(A) Class AB(B) Class B(C) Class A(D) Class C

6) If a negative feedback is provided to an amplifier, the gain of the amplifier_____

(A) Remains constant (B) Increase (C) Becomes zero (D) Decreases

7) For a BJT amplifier, if base to emitter voltage $V_{be} = 0.75\,V$ and base current $I_b = 30\ \mu A$, what will be the value of input impedance h_{ie}?

(A) $10k\Omega$ (B) $15k\Omega$ (C) $25k\Omega$ (D) $35k\Omega$

8) What one of this BJT biasing circuit is β (h_{fe}) independent?

(A) Voltage Divider Bias (B) Fixed Bias

(C) Collector to Base Bias (D) Both (I) and (III)

9) What is the purpose of using coupling capacitor in transistor amplifier?

(A) To block the AC component (B) To block both DC and AC component

(C) To pass the DC component (D) To block the DC component

10) In a Wein bridge oscillator, frequency of oscillator is given by_____

(A) $f = \frac{1}{2\pi RC}$ (B) $f = \frac{1}{RC}$ (C) $f = \frac{1}{2\pi\sqrt{6}RC}$ (D) $f = \frac{1}{2\pi\sqrt{3}RC}$

11) Which oscillator circuit does not use inductor and capacitor component for oscillation purpose?

(A) Hartley (B) Colpitt's (C) Wein Bridge (D) All the above

12) An input voltage $v_{in} = 50\ mV$ is applied at invertingterminal of an op-amp. If the output voltage of an op-amp is -5000 V. What will be the gain of an amplifier?

(A) 1000 (B) -10,000 (C) 200,000 (D) -100,000

13) For an open loop operational amplifier, if v_1 is the input voltage at non-inverting terminal and v_2 is the input voltage at inverting terminal, what will be the differential input voltage?

(A) $v_1 + v_2$ (B) $\frac{v_1 - v_2}{2}$ (C) $\frac{v_1 + v_2}{2}$ (D) $v_1 - v_2$

14) If I_{B1} and I_{B2} are the base bias current of op-amp, then what will be the input bias current I_B of op-amp?

(A) $\frac{I_{B1}+I_{B2}}{2}$ (B) $|I_{B1} - I_{B2}|$ (C) $|I_{B1} + I_{B2}|$ (D) $\frac{I_{B1}-I_{B2}}{I_{B1}+I_{B2}}$

Attempt any four questions from Q-2 to Q-8

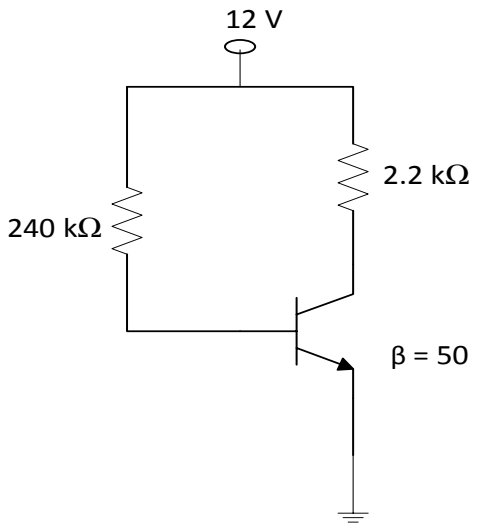
Q-2 **Attempt all questions** **(14)**

(a) Draw the circuit diagram of full wave bridge wave rectifier with capacitor filter and **07**

explain its operation. Draw the waveforms of supply voltage, load voltage and load current.

(b) For the below fixed bias circuit, for β= 50, determine **07**

i) I_B ii) I_C iii) V_{CE}



Q-3 **Attempt all questions** **(14)**

(a) Explain Zener shunt regulator circuit for varying load. (Load regulation) **07**

(b) Explain fixed bias circuit for BJT. **07**

Q-4 **Attempt all questions** **(14)**

(a) Draw the h-parameter model for CE transistor. Obtain the equation for input impedance, forward current transfer ratio and reverse voltage transfer ratio. **07**

(b) For a common emitter amplifier, explain the effect of emitter bypass capacitor on low frequency response. **07**

Q-5 **Attempt all questions** **(14)**

(a) Draw the block diagram of voltage series feedback amplifier. Derive the equation for the following parameters. **07**

i) Voltage gain ii) Input resistance

(b) Draw circuit diagram of Class B push pull amplifier. Explain its operation. **07**

Q-6 **Attempt all questions** **(14)**

(a) Draw the circuit diagram of RC phase oscillator circuit. Obtain the condition $f = \frac{1}{2\pi\sqrt{3}RC}$ for sustained oscillation. **07**

(b) Draw the block diagram of feedback amplifier. Explain function of each block. **07**

Q-7 **Attempt all questions** **(14)**

(a) Draw the circuit diagram of Class A transformer coupled amplifier. Explain its operation. **07**

(b) Enlist the advantages of providing negative feedback to the amplifier. How does it help in stabilizing the final output? **07**

Q-8 **Attempt all questions** **(14)**

(a) Draw the pin diagram of 741 IC op-amp and enlist the ideal characteristics of an op-amp. **08**

(b) Explain the following modes of operational amplifier for open loop configuration. **06**
(i) Differential Amplifier (ii) Inverting Amplifier (iii) Non-inverting Amplifier