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Seat No.	

S.Y.B. Tech. (ETC) (Semester - III) (CBCS)
Examination, January - 2024
PCC-ETC-301 : ELECTRONIC CIRCUIT DESIGN - I
Sub. Code: 73247

10699

Day and Date : Saturday, 6 - 01 - 2024 **Total Marks : 70**

Time : 10.30 a.m. to 1.00 p.m.

Instructions :
1) **All questions are compulsory.**
2) **Use of standard datasheet is allowed.**
3) **Assume suitable data wherever necessary.**
4) **Figures to the right indicate full marks.**

Q1) Choose one correct answer and rewrite the complete statement. **[10]**

a) The wave shaping elements are _____
   i) Resistor ii) Capacitor
   iii) Diode iv) All of the above

b) Formula used to calculate the ripple factor in LC filter along with FWR is____.
   i) $(6\sqrt{2}*\omega^2 L*C)$ ii) $1/(4\sqrt{3}**\omega^2 L*C)$
   iii) $1/(6\sqrt{2}*\omega^2 L*C)$ iv) $R/(6\sqrt{2}*\omega^2 L*C)$

c) Form Factor of FWR is the ratio of_____.
   i) RMS value to DC value ii) DC to RMS value
   iii) Both iv) None of the above

d) Darlington pair is used to boost_____
   i) Current ii) Voltage
   iii) Fold back current iv) All of the above

e) Choose the correct sequence of blocks to design the regulated power supply.
   i) Rectifier +Transformer + Filter + Voltage Regulator
   ii) Transformer + Rectifier + Filter + Voltage Regulator
   iii) Voltage Regulator+ Transformer + Filter + Rectifier
   iv) Transformer + Voltage Regulator + Filter +Rectifier

f) In voltage divider bias, VCC = 25 V; R1 = 10 kΩ;R2=2.2kΩ; RC = 3.6kΩ and RE=1 kΩ What is the emitter voltage?

i) 6.7 V ii) 5.3 V

iii) 4.9 V iv) 3.8 V

g) In CE configuration, if the voltage drops across 5kΩ resistor connected in the collector circuit is 5V. Find the value of I_B When β=50.

i) 0.01mA ii) 0.25mA

iii) 0.03mA iv) 0.02mA

h) A CE amplifier is also called _____ circuit.

i) Grounded emitter ii) Grounded base

iii) Grounded collector iv) None of the above

i) The hie parameter is called as _____ in CE arrangement with output shorted.

i) Voltage gain ii) Current gain

iii) lnput impedance iv) None of the above

j) Thermal runaway occurs when _____ .

i) Collector is reverse biased

ii) Transistor is not biased

iii) Emitter is forward biased

iv) Junction capacitance is high

Q2) Solve the following (15 marks)

a) Explain overload protection circuits. **[7]**

OR

a) Draw and explain BWR with resistive load and draw necessary waveforms. **[7]**

b) Design FWR power supply using C filter for following specifications V_0=12V, I_0=50mA, r = 3%. **[8]**

Q3) Solve the following (15 marks)

a) Derive expression for dc output voltage, rms voltage, ripple factor, Rectification efficiency and Transformer Utilization factor for HWR**[8]**

OR

a) Design FWR power supply using LC filter for following specifications V_0=12V, I_0=50mA, r = 3%. **[8]**

b) Explain with diagram working of emitter follower. **[7]**

Q4) Solve the following (15 marks)

a) Derive the expression for lower cut off frequency of R-C coupled amplifier considering square wave. **[7]**

OR

a) Derive the expression of stability factor for voltage divider biasing circuit. **[7]**

b) Design single stage R-C coupled CE amplifier Vcc=15V, hfe 50, AV = 70,

hie = 3.2KΩ, frequency range 10Hz to 20 kHz, S=10. **[8]**

Q5) Solve the following (15 marks)

a) For C_E amplifier has hfe = 100, hie = 2KΩ, hoe = 50×10^{-6}, hre=2×10^{-4}, Rc = 2KΩ,

RL = 5.6 KΩ, R1 = 10KΩ, R2 = 4.7KΩ. Calculate Av, Ai, Yo. **[8]**

OR

a) Derive Av, Ai, Ri, Ro, Avg, Aig for general amplifier configuration using h-parameter model. **[8]**

b) Draw and explain hybrid equivalent circuit for CB configuration of transistor. **[7]**

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