



**GENERAL INSTRUCTIONS TO THE CANDIDATES**

1. Candidates are instructed to answer the questions as per Bloom's Taxonomy knowledge level ( $K_1$  to  $K_6$ )
2. Candidates are strictly instructed not to write anything in the question paper other than their roll number.
3. Candidates should search their pockets, desks and benches and handover to the Hall Superintendent/Invigilator if any paper, book or note which they may find therein as soon as they enter the examination hall.
4. Candidates are not permitted to bring electronic watches with memory, laptop computers, personal systems, walkie-talkie sets, paging devices, mobile phones, cameras, recording systems or any other gadget / device /object that would be of unfair assistance to him / her.
5. Corrective measures as per KCT examination policies will be imposed for malpractice in the hall like copying from any papers, books or notes and attempting to elicit the answer from neighbours.

**B.E DEGREE EXAMINATIONS: DEC 2015**

(Regulation 2014)

Third Semester

**ELECTRONICS AND COMMUNICATION ENGINEERING**

U14ECT303: Electronic Circuits I

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. Assertion (A): The quantities  $h_{11}, h_{12}, h_{21}$  &  $h_{22}$  are called h or hybrid parameters and these quantities are real number CO2 [K<sub>2</sub>]  
Reason (R): They are not all alike dimensionally and the device include no reactive elements
  - a) Both A & R are true and R is the correct reason for A
  - b) Both A & R are true and R is not the correct reason for A
  - c) A is true and R is true
  - d) A is false and R is true
2. In the design of a transistor amplifier, the following quantities of interest have to be computed in the order as CO2 [K<sub>2</sub>]
  1. Input Impedance
  2. Current Gain
  3. Output Admittance
  4. Voltage Gain

The correct sequence is



9. Arrange the following Power amplifier classes in decreasing efficiency CO5 [K<sub>2</sub>]
1. Class A Power Amplifier
  2. Class D Power Amplifier
  3. Class B Power Amplifier
- Transformer Coupled Class A Power Amplifier
- a) 1-2-3-4 b) 2-3-4-1  
 c) 4-2-3-1 d) 3-1-2-4
10. Which of the following is the application of Class C Power Amplifier? CO5 [K<sub>2</sub>]
- a) Digital Circuits b) Tuned Circuits  
 b) Audio Power Amplifier d) Video Power Amplifier

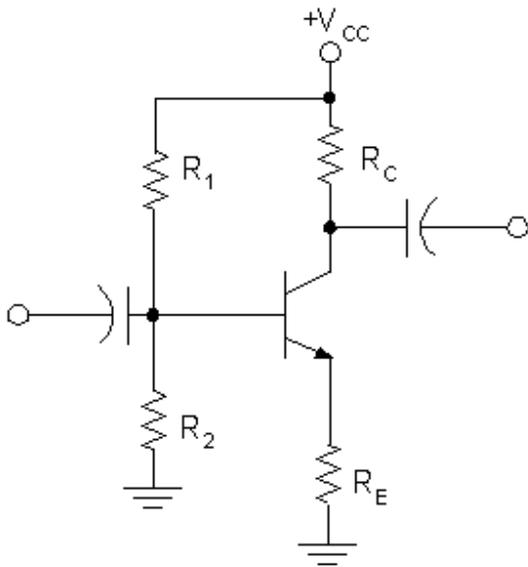
**PART B (10 x 2 = 20 Marks)**  
**(Answer not more than 40 words)**

11. Differentiate Static and Dynamic Load Lines CO1 [K<sub>3</sub>]
12. Briefly describe about thermal runaway. Also state the condition for thermal stability CO1 [K<sub>2</sub>]
13. Draw the hybrid model for the two –port network and write the hybrid equations CO2 [K<sub>2</sub>]
14. State the methods of improving CMRR in a differential amplifier CO2 [K<sub>L</sub>]
15. Differentiate BJT and FET Amplifiers CO3 [K<sub>3</sub>]
16. Draw the AC equivalent model for JFET CO3 [K<sub>2</sub>]
17. What is the effect of emitter by pass capacitor on the frequency response of CE amplifier CO4 [K<sub>2</sub>]
18. Give the expressions for the Miller's input and output capacitance CO4 [K<sub>1</sub>]
19. Why Class D Power amplifiers are more efficient than other classes of power amplifiers? CO5 [K<sub>3</sub>]
20. Mention the advantages of class B amplifier CO5 [K<sub>2</sub>]

**Answer any FIVE Questions:-**  
**PART C (5 x 14 = 70 Marks)**  
**(Answer not more than 300 words)**

**Q.No. 21 is Compulsory**

21. (a) Derive the expression for the bias voltage and current for the Voltage Divider Bias Configuration. 8 CO1 [K<sub>2</sub>]
- (b) Determine the value of  $V_{CE}$  for the circuit shown below which has a supply voltage of 22 V, with the resistance value  $R_1 = 39K\Omega$ ,  $R_2 = 3.9K\Omega$ ,  $R_E = 1.5 K\Omega$ ,  $R_C = 10 K\Omega$  and the beta of transistor is  $\beta = 100$  6



22. Analyze a transistor amplifier circuit using low frequency hybrid parameter model And determine the amplifier parameters. CO2 [K<sub>3</sub>]
23. (i) Explain the different biasing methods of JFET with circuit diagram. (10) CO3 [K<sub>2</sub>]
- (ii) Determine  $V_{GSQ}$  and  $I_{DQ}$  for JFET fixed bias network with  $R_G = 1\text{Mohm}$ ,  $V_{GG} = -2\text{V}$ . The device parameters are  $I_{DSS} = 10\text{ mA}$  and  $V_P = -8\text{V}$ . (4)
24. Derive the expression for Short circuit current gain of a CE Amplifier in high frequency region using hybrid  $\pi$  model. CO4 [K<sub>2</sub>]
25. Explain low frequency and high frequency response of BJT amplifier and derive the expression for critical frequencies for a CE amplifier. CO4 [K<sub>2</sub>]
26. (i) Describe about Class A power amplifier with necessary diagrams and derive the expression for its. (10) CO5 [K<sub>2</sub>]
- (ii) Calculate the efficiency of a transformer – coupled class A amplifier for a supply of 12 V and outputs of i)  $V(p) = 12\text{V}$  ii)  $V(p) = 2\text{V}$  . (4)

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