

2025

M.Sc. 1st Semester Examination

ELECTRONICS

Paper : ELCC401X1

[Analog Circuits and Systems]

Full Marks : 25

Time : One Hour

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What are DC and AC resistance of a diode? 1+1
2. What are the current components of a transistor?
3. What are the advantages and disadvantages of Bridge rectifier over centre tap rectifier? 1+1
4. What are the advantages of FET over BJT?

Group - B

Answer any *two* questions : $4 \times 2 = 8$

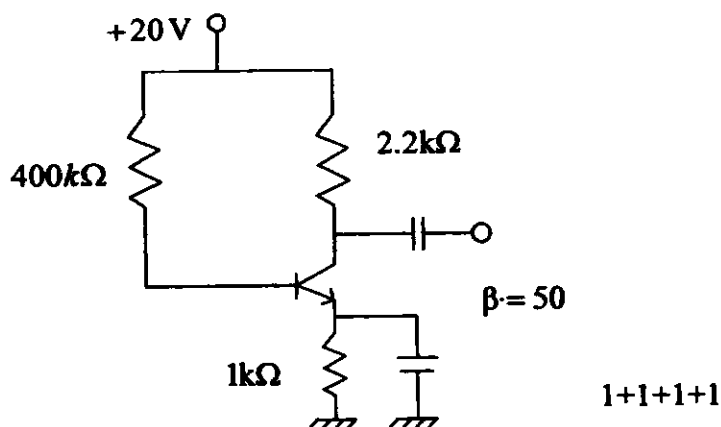
5. Deduce an expression for the RMS value of current of a full wave Bridge rectifier.

P.T.O.

(2)

6. For the following emitter bias circuit

Find I_B , I_C , V_{CE} , and V_{BC} .



7. (a) What are the advantages of negative feedback?

(b) Show that with voltage-series feedback the output impedance decreases. 1+3

8. Draw the ac equivalent circuit of a BJT. Define its different h-parameters. 2+2

Group - C

Answer any *one* question : 8×1=8

9. What are the characteristics of an ideal OPAMP? What is CMRR? Design an integrator and a differentiator circuit. 2+2+(2+2)

(3)

10. (a) Draw the transfer characteristic of a FET.
(b) Draw the ac equivalent circuit of a JFET under fixed bias condition.
(c) A JFET is characterised by

$$I_{DSS} = 8 \text{ mA and } V_p = -4V$$

Find the maximum value of g_m

Find g_m at $V_{GS} = -0.5V$ and $V_{GS} = -1.5V$.

3+2+3

Internal Assessment : 5 marks
