S.E. ECS SEM III C-scheme KT June 2026

(10)

Duration: 3 Hours

Maximum Marks: 80

06/06/26

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 **Attempt any FOUR** [20]

a Explain the Reverse bias mode of operation of the P-N junction diode with neat sketch.

b Explain the operation of the light emitting diode (LED) with neat sketch.

c What is clipper? Explain its types in detail.

d Explain construction and working principle of JFET.

e Explain the operation of capacitor (C) type filter with neat sketch.

2 a Explain operating principle, construction and working of Memristors with neat sketch. [10]

b With neat sketch explain the concept of DC load line and operating point in BJT. [10]

3 a A 230 V, 60 Hz voltage is applied to the primary of a 5:1 step down center tapped transformer used in a FWR having a load of 900Ω. If the diode resistance and secondary coil resistance together has a resistance of 100Ω, Determine: [10]
(a) DC voltage across the load.
(b) DC current flowing through the load.
(c) DC power delivered to the load and PIV across each diode
(d)Ripple voltage and its frequency.

b Explain characteristics of Zener diode. Discuss Zener diode as voltage regulator. [10]

4 a Explain Working principle and characteristics of n channel E-MOSFET [10]

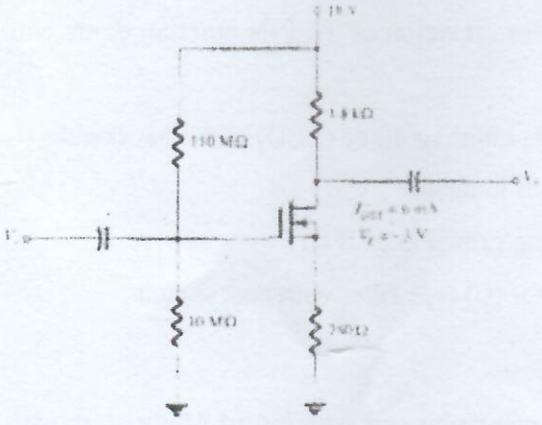
b What are mersistors? Explain the operating principle, construction & working of memristors with a neat sketch. [10]

5 a With a neat sketch, write a short note on solar cell describing its structure or construction, working & V-I characteristics. [10]

b For the n -channel depletion-type MOSFET of Fig. determine [10]

a. I_{DQ} and V_{GSQ}.

b. V_{DS} .



6 a Explain construction and working principle of Single Electron Transistor. [10]

b With neat circuit diagram explain the operation of centre-tapped full wave rectifier. Derive expression for ripple factor. [10]
