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**Total No. of Pages: 02**  
**Total No. of Questions: 09**

**B. Tech. (Sem.-3<sup>rd</sup>)**  
**ELECTRONIC DEVICES & CIRCUITS**  
**Subject Code: EC-201**  
**Paper ID: A0301**

**Time: 3 Hrs.**

**Max. Marks: 60**

**Instruction to candidates:**

1. Section-A is compulsory consisting of TEN questions carrying TWO marks each.
2. Section-B contains FIVE questions carrying FIVE marks each. Student has to attempt any FOUR questions.
3. Section-C contains THREE questions carrying TEN marks each. Student has to attempt any TWO questions.

**Section –A**

**(2x10=20)**

- Q1. (a) Explain why a PN-junction possesses capacitance?  
(b) Explain the term biasing?  
(c) What is a ripple factor?  
(d) Draw equivalent circuit of an FET.  
(e) List applications of photo transistor.  
(f) Name the two types of reverse breakdowns which occur in a PN- junction diode.  
(g) Define peak inverse voltage.  
(h) Draw well-labelled characteristics of PN-junction diode.  
(i) What is meant by thermal-runaway in a transistor? Explain  
(j) Explain why CE configuration is most popular in amplifier circuits?

**Section –B**

**(4x5=20)**

- Q2. Explain the constructional features and working of N-channel JFET .Also draw its well-labelled characteristics.
- Q3. Name various special purpose diodes and explain each briefly. Also list applications of each
- Q4. Explain why operating point is fixed in the centre of the active region of transistor characteristics in a good voltage amplifier?
- Q5. Discuss the effect of emitter by-pass capacitor and shunt capacitor on frequency response of an amplifier.
- Q6. Explain the construction and working of (i) Depletion MOSFET (ii) CMOSFET

### Section –C

(2x10=20)

- Q7. In what respect is an LED different from an PN-junction diode? State applications of LED's.  
Why should you prefer LED's over conventional incandescent lamps?
- Q8. In a centre-tap full wave rectifier, the load resistance  $R_L = 1k\Omega$ . Each diode has a forward-bias dynamic resistance  $r_d = 10\Omega$ . The voltage across half the secondary winding is  $220\sin(314)t$ .  
Find:
- (i) The peak value of current
  - (ii) The dc or average value of current
  - (iii) The rms value of current
  - (iv) The ripple factor
  - (v) The rectification efficiency
- Q9 (i) Discuss bias compensation methods in detail.  
(ii) Draw and explain various transistor biasing circuits.

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