



**MCC-003-0492006**

Seat No. \_\_\_\_\_

**B. Sc. / M. Sc. (Applied Physics) (Sem. II) (CBCS)  
Examination**

**April / May - 2018**

**Basic Electronics - VIII  
(New Course)**

**Faculty Code : 003**

**Subject Code : 0492006**

Time :  $2\frac{1}{2}$  Hours ]

[ Total Marks : 70

- Instructions :** (1) All questions are compulsory.  
(2) Numbers in the right margin indicate marks.

**1** Attempt any seven short questions : (Two marks each) **14**

- (1) Define break down voltage.
- (2) Discuss the properties of semiconductors.
- (3) Which are the most commonly used semiconductors and why ?
- (4) Draw the symbol of crystal diode and Zener diode.
- (5) What is crystal diode ? Explain its rectifying action.
- (6) What is Zener diode ? Draw V–I characteristics of Zener diode.
- (7) Write the application of LED.
- (8) Write the advantages of transistor.
- (9) Draw the common base and common collector connection.
- (10) Draw the circuit of a practical single stage amplifier.

**2** (a) Write answers of any two : **10**

- (1) Discuss the types of semicondures.
- (2) What is a PN junction ? Explain the formation of potential barrier in PN junction.
- (3) Explain working of centre–tap full wave rectifier with neat sketch.
- (4) What is a ripple factor ? Calculate value for a half wave and full wave rectifier.

- (b) Write answers of any one : 4
- (1) Give the mechanism of hole current flow in a semiconductor.
  - (2) Describe the action of the following filter circuits:  
(i) capacitor filter, (ii) chock input filter and  
(iii) capacitor input filter.
- 3** (a) Write answers of any two : **10**
- (1) Write a short note on photo diode.
  - (2) Discuss tunnel diode with their application.
  - (3) Explain and working of Shockley diode.
  - (4) Explain and working of varactor diode with its applications.
- (b) Write answers of any one : 4
- (1) Describe working principal of LED.
  - (2) What is optoisolater ? Discuss in detail.
- 4** (a) Write answers of any two : **10**
- (1) Explain the operation of transistor as an amplifier.
  - (2) Discuss input and output characteristics of common emitter connection of transistor.
  - (3) Compare the various characteristics of CE, CB and CC connections in transistor.
  - (4) Write short note on :
    - (1) Advantages of transistor
    - (2) Operating point.
- (b) Write a short note of any two : 4
- (1) Write the mathematical relation between  $\beta$  and  $\alpha$ .
  - (2) Explain the construction of transistor.
  - (3) Explain voltage gain in transistor.
  - (4) Discuss the working of npn and pnp transistor.

- 5 (a) Write answers of any two : 10
- (1) Discuss voltage divider biasing in detail.
  - (2) Explain biasing with collector feedback resistor with advantages and disadvantages
  - (3) Explain the role of capacitor in transistor amplifiers.
  - (4) What is stabilization ? Explain need of stabilization.
- (b) Write answers of any one : 4
- (1) Write essentials for a biasing circuit.
  - (2) Explain frequency response, decibel gain and bandwidth for transistor amplifiers.
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