

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
FIRST SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

**Course Code: BE101-04**

**Course Name: INTRODUCTION TO ELECTRONICS ENGINEERING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all questions, each carries 5 marks.*

Marks

- |   |  |     |
|---|--|-----|
| 1 | With a neat diagram, explain the constructional features of an electrolytic capacitor.   | (5) |
| 2 | a) Explain how a varactor diode can be used in tuned circuits?   | (3) |
|   | b) Explain the term peak inverse voltage (PIV) of a diode.   | (2) |
| 3 | Draw the output V-I characteristics of a common emitter amplifier and mark the operating point on the load line for $V_{CE} = 6V$ and base current $I_b = 0.2mA$ , take $\beta$ as 50. | (5) |
| 4 | Give the structure of an enhancement type MOSFET and why it is called so.  | (5) |
| 5 | Draw the voltage transfer characteristics of a general limiter circuit and explain how it act as clipper.  | (5) |
| 6 | Draw the circuit diagram of a voltage doubler and explain the working.   | (5) |
| 7 | Define the terms accuracy and precision of a measuring device?   | (5) |
| 8 | How do you test an NPN as well as a PNP transistor using multimeter?   | (5) |

**PART B**

*Answer six questions, one full question from each module and carries 10 marks.*

**Module I**

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|---|--|-----|
| 9 | a) What are the advantage of carbon film resistor over carbon composition resistors. | (4) |
|   | b) Give the constructional features of carbon film resistor with a neat diagram.     | (6) |

**OR**

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|----|---|-----|
| 10 | a) How cooling is effected in high power wire wound resistors.                  | (4) |
|    | b) Explain the constructional features of a wire wound resistor with a diagram. | (6) |

**Module II**

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|----|---|-----|
| 11 | a) Draw the V-I characteristics of a Silicon diode. The above diode is forward biased with a dc supply voltage of 5 V. Find the Q points for 1.1 k $\Omega$ and 2.2 k $\Omega$ of load resistance. (Assume cut in voltage of diode is 0.6 v). | (5) |
|    | b) With the help of a diagram, explain the working of a photo diode.  | (5) |

**OR**

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|----|--|-----|
| 12 | a) What is drift current and diffusion current in a semiconductor? | (5) |
|    | b) How the barrier potential is developed across a PN Junction?    | (5) |

**Module III**

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|----|--|-----|
| 13 | a) Distinguish between common emitter and common base current gain of a transistor and derive a relation between them.         | (5) |
|    | b) Explain the biasing condition applied across different junctions of a transistor in active, saturation and cut-off regions. | (5) |

**OR**

- 14 a) Draw and explain the circuit of a common emitter RC coupled amplifier using NPN transistor with voltage divider biasing. (6)
- b) Draw the frequency response of a RC coupled amplifier and explain how gain reduces at low and high frequencies. (4)

**Module IV**

- 15 a) Draw the  $V_{DS}$  v/s  $I_D$  curve of an enhancement MOSFET and mark different operating regions. (3)
- b) With help of neat sketches, explain how an increase in  $V_{DS}$  affects channel field and drain current in a MOSFET. (7)

**OR**

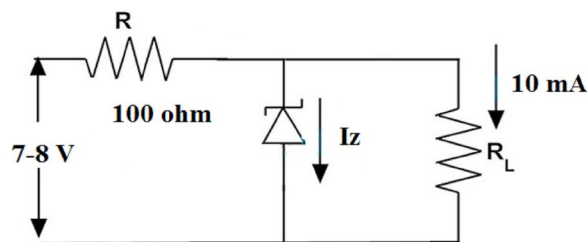
- 16 a) Draw the structure of N channel depletion MOSFET. (3)
- b) Explain the working of a depletion mode MOSFET. (7)

**Module V**

- 17 a) Draw the circuit of a full wave bridge rectifier and derive the equations for  $V_{rms}$ ,  $V_{dc}$  and ripple factor. (7)
- b) Explain the term rectifier efficiency. (3)

**OR**

- 18 a) Draw the block diagram of a DC power supply and explain the working of each stage. (5)
- b) Find the minimum and maximum current flowing through the Zener diode as shown in figure for a regulated output of 5 V. Choose proper value for  $R_L$ . (5)



**Module VI**

- 19 a) Draw the block diagram and explain the working of a CRO. (6)
- b) Explain with help of diagrams, how phase difference between two signals can be measured using CRO. (4)

**OR**

- 20 a) Draw the block diagram and explain the working of a digital storage oscilloscope. (6)
- b) List and describe the various types of measurement errors. (4)

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