



**JBD-003-1151001** Seat No. \_\_\_\_\_

**M. Sc. (Electronics) (Sem. I) (CBCS) Examination**

**December - 2019**

**Fundamental of Electronics**

**Technology : Paper - I**

*(New Course)*

**Faculty Code : 003**

**Subject Code : 1151001**

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

[Total Marks : 70

- Instructions :** (1) All question carry equal marks.  
(2) Figures on right hand side indicate marks.

**1** Answer the following : **14**

- (1) The same \_\_\_\_\_ is present across all branches of a parallel circuit. (Voltage, Current)
- (2) Cells are connected in parallel when higher \_\_\_\_\_ is required. (Voltage, Current)
- (3) An ideal constant-voltage source has \_\_\_\_\_ resistance. (Infinite, Zero)
- (4) According to Thevenin's theorem, any network with two open terminals can be replaced by a single voltage source  $V_{th}$  in \_\_\_\_\_ with a single resistance  $R_{th}$  (Series, Parallel)
- (5) Name the different types of resistors.
- (6) Ceramic capacitors have very large capacitance even in small sizes. (T/F)
- (7) P-N junction can be formed by welding a P-type crystal to an N-type crystal. (T/F)
- (8) A Schottky diode utilizes metal-metal junction. (T/F)
- (9) The intrinsic stand-off ratio of a UJT is always less than unity. (T/F)

- (10) What is the decimal equivalent of  $10100_2$  of the binary number?
- (11) Convert decimal 27 into its binary equivalent.
- (12) Convert  $101011_2$  into its octal equivalent.
- (13) The double-dabble method is used for \_\_\_\_\_ to binary conversion. (Octal, decimal, hexadecimal)
- (14) Draw the symbol of TRIAC.

**2** Answer the following : (Any Two)

- (1) Explain zero reference level with chassis ground. **7**
- (2) Give the Ohm's law and discuss about series and parallel circuits. **7**
- (3) Explain Kirchhoff's current and voltage laws with determination of algebraic sign. **7**

**3** Answer the following :

- (a) State the Superposition theorem. Which steps are taken while applying this theorem? **5**
- (b) State the Thevenin's theorem. How to Thevenize a circuit ? **5**
- (c) Discuss about ideal constant-voltage source and constant-current source. **4**

**OR**

**3** Answer the following :

- (a) Discuss about different types of resistors. Give the table of colour code for carbon-composition resistor. **5**
- (b) What is a thyristor? Discuss its (SCR) layer diagram, operation and characteristics. **5**
- (c) Write notes on JFET. **4**

**4** Answer the following : (Any Two)

- (1) (A) Explain different Number systems. Also discuss binary number system in detail. **4**
- (B) Write steps for converting binary integer into its equivalent decimal number. Convert  $11001_2$  to its equivalent decimal. **3**

- (2) Define the term logic gate. Discuss about OR, AND, NOT and Exclusive OR gate with symbols and truth tables. 7
- (3) State the De Morgan's theorems with illustration and prove the Boolean identity.  $(A+B)(A+C) = A+BC$  7
- 5** Answer the following : (Any Two)
- (1) Which types of arithmetical functions can be done by logical gates? Discuss about Half Adder and Full Adder with block diagrams and truth tables using AND, OR, Ex-OR gates. 7
- (2) Write the unique feature of Boolean algebra and give the laws of Boolean algebra with names. 7
- (3) Define the terms analog and digital instruments and discuss about D'Arsonval meter movement. 7
- (4) Describe an overview of application of a CRO. Draw the basic block diagram of an oscilloscope and explain the function of each block. 7
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