

**DIPLOMA IN MECHANICAL ENGINEERING
(DME)**

Term-End Examination

December, 2012

00703

BEE - 042 : ELECTRONICS

Time : 2 hours

Maximum Marks : 70

Note : (i) Question No. 1 is *compulsory*.
(ii) Answer *any four* questions of the remaining questions numbered 2 to 8.

1. (a) State **true** or **false** for the given statements : 7x1=7
- (i) Electrons are majority carries in N-type Semiconductors.
 - (ii) A zener diode operates in the break down region.
 - (iii) A transistor is said to be saturated when $V_{cE}=0$.
 - (iv) A FET is a Unipolar device.
 - (v) An SCR is a Unidirectional device unlike triac which is bidirectional.
 - (vi) A Flip Flop is used to store 1-bit of information.
 - (vii) A full wave bridge rectifier has ripple factor of 1.21.

- (b) Select the correct answer from the given four alternatives. 7x1=7
- (i) In full wave rectifier, if the input frequency is 50 Hz, the output frequency is :
- (A) 50 Hz (B) 100 Hz
(C) 200 Hz (D) 25 Hz
- (ii) In an SCR, the function of the gate is to :
- (A) switch it off
(B) control its firing
(C) make it unidirectional
(D) reduce forward voltage
- (iii) Which of the following device is used to measure Humidity ?
- (A) Pyrometer
(B) Venturimeter
(C) Hygrometer
(D) None
- (iv) Seismic mass is used to measure :
- (A) velocity (B) mass
(C) acceleration (D) density
- (v) The gate whose output is low if and only if all the inputs are high, is :
- (A) NAND (B) NOR
(C) OR (D) AND

(vi) In a transistor the current conduction is due to _____ charge carriers.

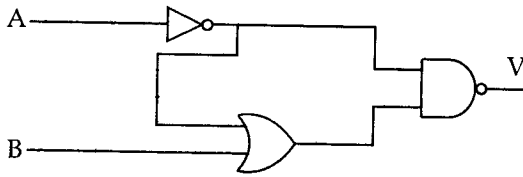
- (A) majority
- (B) minority
- (C) Both (A) and (B)
- (D) none of above

(vii) $(36)_{10} = (?)_2$

- (A) 100100
- (B) 101010
- (C) 111000
- (D) 1001100

2. (a) A bridge rectifier is connected to 230 V, 50 Hz source voltage and load resistance of 20 K Ω calculate. 7
- (i) V_{dc}
 - (ii) I_{dc}
 - (iii) Ripple voltage
- (b) With a neat circuit diagram, explain Zener diode voltage regulator. 7
3. (a) Sketch typical transistor input and output characteristics for CE configuration and explain the three regions of operation. 7
- (b) Define Biasing of transistor. Explain with neat circuit diagram the operation of fixed bias circuit. 7

4. (a) Give the truth table of the given digital circuit. 7



- (b) Explain the following with truth table and logic circuit : 7

(i) T-Flip Flop (ii) D-Flip Flop

5. (a) What is an UJT ? Explain how UJT works as a Relaxation oscillator ? 7

- (b) Explain the working of Triac and draw the V-I characteristics of Triac. 7

6. (a) With the help of a block diagram explain the functional element of a generalised measuring system. 7

- (b) Draw the schematic diagram of Radiation- pyrometer and explain its working. 7

7. (a) With a neat sketch explain the working of X-Y Recorder. 7
- (b) With the help of block diagram explain the construction and working of Digital frequency meter. 7
8. (a) Draw the schematic diagram of LVDT and explain briefly its characteristics. 7
- (b) Discuss various types of dc motor and write down their main characteristics. 7
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