16172

3 Hours / 100 Marks   Seat No. ⬚⬚⬚⬚⬚⬚⬚⬚

Instructions :   (1) **All** *questions are* **compulsory**.

(2) *Answer* **each** *Section on same/separate answer sheet.*

(3) *Illustrate your answers with neat sketches* **wherever** *necessary.*

(4) *Assume suitable data, if* **necessary**.

(5) *Use of Non-programmable Electronic Pocket Calculator is* **permissible**.

(6) *Mobile Phone, Pager and any other Electronic Communication devices are* **not** *permissible in Examination Hall.*

Marks

SECTION – I

1. Attempt **any nine** of the following :   **18**

   a) Define current and voltage with their units.   **2**

   b) Give any two advantages of polyphase supply.   **2**

   c) Define frequency and phase.   **2**

   d) Draw speed torque characteristics of 3 phase induction motor.   **2**

   e) List applications of auto transformer.   **2**

   f) Write classification of electric drives.   **2**

   g) State how the direction of rotation of 3 phase induction motor be reversed.   **2**

   h) State the function of fuse.   **2**

   i) State two types of earthing.   **2**

   j) State two advantages of M.C.C.B.   **2**

   k) Define voltage ratio and current ratio of transformer.   **2**

2. Attempt **any four** of the following :   **16**

   a) Define the following terms and its relation with amplitude.   **4**

     a) R.M.S. value   b) Average value.

   b) State the sequence of three phase supply, draw the phasor diagram of three phase supply. Write the equation of total power consumed in star and delta connected loads.   **4**

   c) Define efficiency and voltage regulation of transformer.   **4**

   d) Explain with suitable diagram working of universal motor.   **4**

   e) State 4 factors considered for selection of motor in different drives.   **4**

   f) State the necessity of earthing in electrical equipments.   **4**

P.T.O.

Marks

3. Attempt **any four** of the following :   **16**
   a) Draw the construction diagram and explain the principle of operation of a single phase transformer.   **4**
   b) Draw circuit diagram of direct on line starter.   **4**
   c) What are the first aid measures taken when any person receives electrical shock ?   **4**
   d) What are C.F.L. lamps ? What are its advantages ?   **4**
   e) Explain the speed control of 3 phase induction motor by variable frequency drive with the help of block diagram.   **4**
   f) Define the emf equations of transformer and state the meaning of each terms.   **4**

SECTION – II

1. Attempt **any nine** of the following :   **18**
   a) Draw a symbol of photo diode and LED.   **2**
   b) State any four specification of photo transistor.   **2**
   c) Define α and β of the transistor.   **2**
   d) What is rectifier ? What are its types ?   **2**
   e) Define the term gain and band width of an amplifier.   **2**
   f) Convert the binary 110011 to decimal.   **2**
   g) State Barkhausens criteria of oscillations.   **2**
   h) Draw logic symbol and expression of AND and EX-OR gates.   **2**
   i) A full wave rectifier with capacitor filter employ $RL = 50\ \Omega$, $C = 1000\ \mu f$. Calculate ripple factor.   **2**
   j) Draw dc load line of CE amplifier and define Q point.   **2**
   k) Perform the following convertion :   **2**
      i) $(212)_{10} = (?)_2$ ii) $(436)_8 = (?)_2$

2. Attempt **any four** of the following :   **16**
   a) Explain the circuit of transistor as a switch.   **4**
   b) Explain the working principle of LCD.   **4**
   c) What is filter ? State the need of filter. List different types of filters.   **4**
   d) Draw the circuit diagram of crystal oscillator and explain.   **4**
   e) Define line regulation and load regulation.   **4**
   f) Draw and explain RC phase shift oscillator. State its two application.   **4**

3. Attempt **any four** of the following :   **16**
   a) What is universal gate ? Design basic gates using NAND gates only.   **4**
   b) Draw circuit diagram of center tapped full wave rectifier. Explain its operation with waveforms.   **4**
   c) Give comparison between CE and CB configuration (any four points).   **4**
   d) Explain the working principle of LED.   **4**
   e) Draw the circuit of two stage RC coupled amplifier. Draw its frequency response.   **4**
   f) Draw the symbol and truth table of   **4**
      i) OR gate   ii) XNOR gate   iii) NOT gate.