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12425 03 Hours / 70 Marks Seat No. I I

Instructions – (1) All Questions are Compulsory.

- (2) Answer each next main Question on a new page.
- (3) Illustrate your answer with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.

Marks

Attempt any <u>FIVE</u> of the following: 10 a) Define Ohm's Law and write it's equation. b) State Faraday's Law of Electromagnetic Induction. c) Define Voltage Ratio and Transformation ratio. d) List any four safety tools used in electrical workshop.

- e) List the advantages of VFD.
- f) Give the classification of Electric drives.
- g) State the necessity of starter for 3-phase induction motor.

- a) List the different types of Enclosure are used for electric drive.
- b) List any two advantages and disadvantages of moving iron instruments.
- c) Define Fuse. State the Need of fuse. Describe operation of Fuse.
- d) Compare two winding and Autotransformer on the basis of following points.
 - i) Symbol
 - ii) No. of Windings
 - iii) Secondary Voltage
 - iv) Applications.

3. Attempt any THREE of the following:

- a) Define the following terms w.r.to magnetic circuits.
 - i) Magnetic flux
 - ii) Reluctance
 - iii) Flux density
 - iv) MMF.
- b) Define following terms:
 - i) Frequency
 - ii) Time period
 - iii) RMS Value
 - iv) Amplitude.
- c) Write the applications of stepper motor.
- d) Write the color coding significance of Electrical conductor for 3-Phase and 1-Phase AC wiring.
- e) Explain the working of PMMC instrument with neat diagram.

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4. Attempt any THREE of the following:

- a) A 1-Phase, 20KVA, 230/115 V, 50Hz. Transformer used in a Laboratory. Find:
 - i) Primary current
 - ii) Secondary current
 - iii) Turns ratio
 - iv) Current ratio.
- b) State the functions MCB and ELCB. Also write their applications.
- c) Write the applications of following measuring instruments.
 - i) Electo-dynamic Watt meter
 - ii) Megger
 - iii) Digital multimeter
 - iv) Energy meter.
- d) For purely capacitive circuit:
 - i) Draw circuit diagram
 - ii) Phasor diagram
 - iii) Impedance equation
 - iv) Current equation.
- e) Describe B-H curve of magnetic circuit with neat diagram.

5. Attempt any <u>TWO</u> of the following:

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- a) Define Universal motor. List the types of Universal motor. Describe operation of universal motor. Also write the applications of Universal motor.
- b) Draw the neat labelled construction of DC motor. State the functions of poles and commutator.
- c) A balanced star connected load is supplied from 400V, 50Hz, 3-Ph AC supply. The resistance per phase is 25Ω . Calculate:
 - i) Phase voltage
 - ii) Line current
 - iii) Phase current
 - iv) Total power.

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a) Using series-parallel combination law. Find the resistance between terminal A and B of the network shown in Figure No. 1.



Fig. No. 1

- b) Differentiate between Electric and Magnetic circuit. (Any six points)
- c) State the factors for selection of motor for different drives.

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