Scheme – G

Sample Question Paper

Course Name : Diploma in Automobile Engineering

Course Code : AE

Semester : Fifth

17524

Subject Title : Basic Electrical and Electronics

Marks : 100 **Time: 3 Hours**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. A) Attempt any three of the following: **12 Marks**

a) Define the terms Magnetic Flux andmagnetic Flux Density. State their units.
b) Draw a sketch of single turn elementary alternator and name the parts. Also state the rule which decides the direction of current in the conductor.
c) State the difference between PNP and NPN transistor. Give their symbols.
d) Draw standard symbols of i) LDR ii) Multi-Cell Battery iii) Dual Filament Bulb iv) Horn or Speaker

Q.1. B) Attempt any one of the following: **06 Marks**

a) Two resistances of 8 ohms and 24 ohms respectively are connected in parallel. Another resistance of 10 ohms is connected I series with the combination. Calculate respective volages which should be applied across the whole circuit: i) To pass 6 A through 10 ohm resistance and ii) To pass 6 A current in 20 ohm resistance.
b) Draw wiring diagram of wind shield wiper. Describe how the speed of the wiper is adjusted.

Q2. Attempt any four of the following: **16 Marks**

a) If current and violate are represented as $I = I_m \sin(\Theta + 30^{0})$ and $v = V_{m \sin} \Theta$, draw Waveforms for I and v and state and represent them as phasers.
b) State the importance of colour coding in automobile electric wiring.
c) State the principle on which stepper motor works. Draw a sketch of a stepper motor to indicate various parts of the motor.

d) Draw symbolic representation of SCR. State the meaning of the following terms related to SCR. I) Holding Current ii) Breakdown Voltage and iii) Forward current rating.
e) Draw a labeled diagram of LVDT and describe its function as Gauge for displacement measurement
f) Define Current Amplification Factor α and Base Current Amplification Factor β. These factors are related respectively to which type of configuration.

Q3. Attempt any four of the following: 16 Marks

a) Define the terms Accuracy and Precision related to measurement. State the difference between them.
b) i) Draw symbols of D. C. Series & Shunt Motors as per the related IS.
ii) Define: i) Extrinsic semiconductor ii) Intrinsic Semiconductor
c) In which of the following figures the relationship between voltage and current is in accordance with Ohm's Law? Redraw the figure. State the condition under which this relationship is true.
d) Draw symbols and truth table for AND & OR gate.

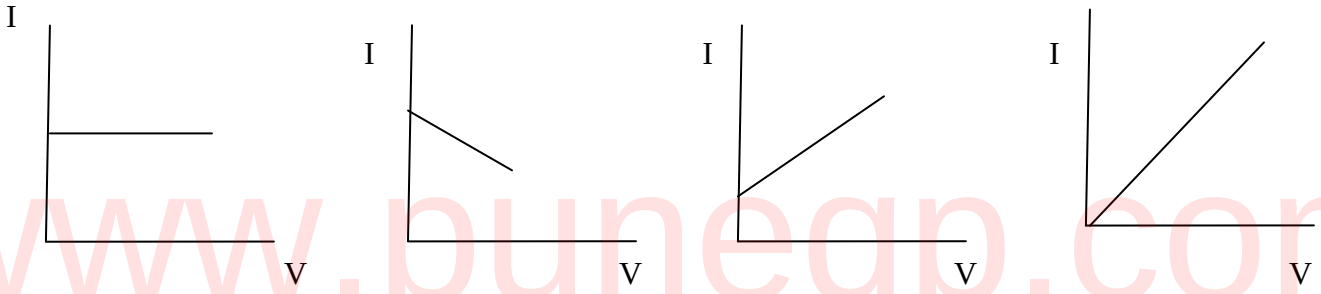


Fig. A Fig. B Fig. C Fig. D

e) State the differences between Thermistor and RTD.

Q4. A) Attempt any three of the following: 12 Marks

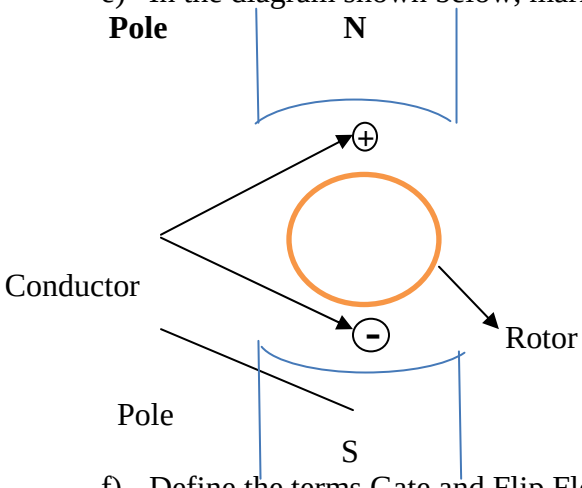
a) Draw neat sketches circuit diagram of a full wave rectifier. Describe how conduction occur in both half cycle of the wave.
b) State four advantages of positive earth system.
c) Define the terms static error and dynamic error. State two dynamic errors that occur in measurement.
d) Define R. M. S. value of an alternating quantity. For a sinusoidal wave form state the relation of R. M. S value to Average Value.

Q4. B) Attempt any one of the following: 06 Marks

a) Draw wiring diagram of **windshield** wiper. Describe how the speed of the wiper is adjusted.
b) State the meaning of the term Multiplexer. What is the other common name for Multiplexer. Draw a schematic of 2 to 1 Multiplexer.

Q5. Attempt any four of the following: **16 Marks**

a) Draw a neat sketch of stroboscope and describe the working to measure speed of induction motor.
b) **"**A plain single phase A. C. Motor is not self-staring." State with reason if the statement is true or false.
c) Draw a circuit diagram to show the connections where Zener Diode is used as voltage regulator. Describe how voltage regulation is achieved.
d) Draw wiring diagram for turn indicator and describe its function.
e) In the diagram shown below, mark the direction of rotation of the rotor. Name and state the Rule used to decide the direction of rotation.



The direction of the current is the conductors is such that current enters in top conductor and comes out from bottom conductor.

f) Define the terms Gate and Flip Flop. Draw symbols of RS (Using NAND Gate) and D Flip- Flop.

Q6. Attempt any four of the following: **16 Marks**

a) Draw Symbols of Shift Register and Multiplexer and State two applications of each.
b) The number of turns of low voltage winding of a 200 KVA, 50 Hz., 11000/400 V single phase transformer is 25. Calculate i) Peak value of magnetic flux in core ii) Full load current on L. V. Side and iii) Number turns on H. V. side.
c) Draw a labled diagram of 2 stage R-C coupled amplifier. Give the function of RE, CE & CC.
d) Draw a neat diagram of Ultrasonic Flowmeter and describe its working.
e) State the principle on which Pirani Vacuum Guage works. Draw a labled block diagram of Pirani Guage

Scheme – G

Sample Test Paper-I

Course Name : Diploma in Automobile Engineering

Course Code : AE **17524**

Semester : Fifth

Subject Title : Basic Electrical and Electronics

Marks : 25 **Time:1 hour**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order
6. (Note- Curriculum from Topic: 01 to 04 (upto topic 4.5)

Q1. Attempt any THREE of the following **Marks 09**

a) Calculate current through branch AB using current division rule in the following circuit of Fig. 1

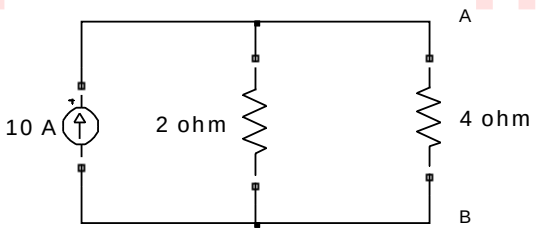


Fig No. 1

b) Define following terms related to magnetic circuits.
   i. Reluctance
   ii. Magnetic flux Density
   iii. Magneto- motive force.

c) Define the terms Self Inductance and Mutual Inductance.

d) Draw a circuit showing connections of an Ammeter and a Voltmeter

Q2. Attempt any TWO of the following **Marks 08**

a) A circuit consisting of resistance of 12 Ω, 18 Ω, & 36 Ω respectively joined in parallel is connected in series with a forth resistance R. Determine the value of equivalent resistance of the circuit.

b) A sinusoidal a. c voltage has maximum value of 141.4 volts, what is the Average and R. M. S. value.

c) Define voltage regulation of a transformer.

Q.3 Attempt any TWO of the following **Marks 08**

a) "A D. C. Series motor can not be started on No Load" State with reasons if the statement is true or False.

b) " A single phase induction motor self-starting" Is it true or false? State reasons for your answer.

c) Draw an elementary alternator diagram. Label the same and mark the direction of rotation of the coil, magnetic flux and direction of rotation.

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Sample Test Paper-II

Course Name : Diploma in Automobile Engineering

Course Code : AE **17524**

Semester : Fifth

Subject Title : Basic Electrical and Electronics

Marks : 25 **Time:1 hour**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order
6. (Note- Curriculum from Topic: 4.6 to 08 (upto topic 4.5)

Q.1 A) Attempt any THREE of the following **Marks 09**

a) Define i) extrinsic semiconductor. ii) Intrinsic semiconductor. Iii)P-type semiconductor. iv) N-type semiconductor

b) Draw two stage R-C coupled amplifier. Give the function of RE, CE and CC

c) Write two different ways by which SCR can be i) Turned ON. Ii) Turned Off.

d) State the meaning of the term doping. How through doping transistors are formed.?

Q.**2 Attempt any TWO of the following** **Marks 08**

a) State the importance of colour coding in automobile wiring.

b) State the difference between insulated and ground return systems.

c) Define the terms Linearity, Repeatability and Reproduciability.

Q.3 Attempt any TWO of the following **Marks 08**

a) Draw the symbols and Truth table for Not and NOR gates.

b) Draw a block diagram of shift register and state the principle of its working.

c) Describe with a diagram working of seven segment LED display.