Registration No.....

SCHOOL OF ELECTRICAL SKILLS
FIRST SEMESTER EXAMINATION-2017
SUMMER SEMESTER, B.VOC PROGRAM

Course Code: ELE1001 **Time: 1 Hour**

Course Name: Construction Electrician **Max. Marks: 20**

Instructions: Answer all questions from section A, each question carries one marks. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks.

Section A **(5X1=5)**

1	The colours of phase, neutral & earth wire in the house wiring are (a) Yellow, Blue, Red (b) Red, Black, Green (c) Red, Pink, Yellow (d) None of above
2	The unit of frequency is (a) Hertz (b) KW (c) KVAR (d) KVA
3	The Ammeter has to be connected in electrical circuit always in (a) Parallel (b) Series (c) Series-Parallel (d) None of these
4	The devices used for cutting the cables are (a) Combination Pliers, Cable cutter & Knife (b) Pliers (c) Crimping Tool (d) File
5	The maximum resistance of an electrical earthing system as per Indian standard should be (a) Less than 2 ohm (b) More than 2 ohm

	(c) More than 10 ohm (d) More than 100 ohm

Section B (3X2=6)

1	Why the earth pin of the plug is always made longer & thicker in comparison to phase and neutral wire pins?
2	Why lugs are used for connecting the cables?
3	Write the names of all the PPEs used by an electrician.

Section C (3X3=9)

1	Two bulbs of 60 watts and 25 watts are connected in the series of 240 V A.C. supply in the circuit. Which bulb will glow brightly? Answer it with explanation.
2	What is the function of electrical hand drill machine? Explain its various parts.
3	Why all the house hold appliances are connected in the parallel and not in series in our houses? If they are connected in series than what will happen?

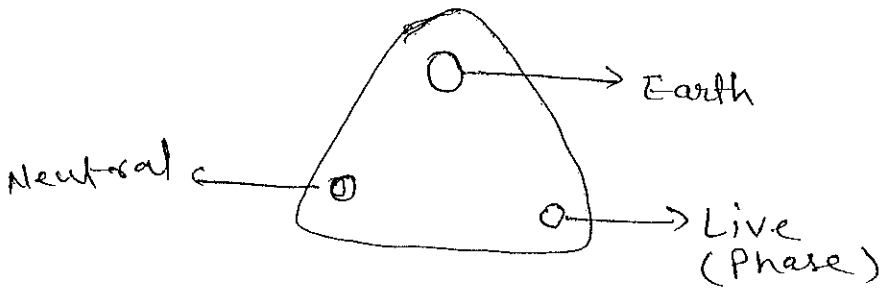
Course Name: Construction Electrician
Course code: ELE1001

Section A

1. Ans: (b) Red, Black, Green
2. Ans (a) Hertz
3. Ans (b) series
4. Ans (a) Combination pliers, Cable Cutter & ...
5. Ans (a) Less than 2 Ω.

Section - B

2. Ans:



The earth pin is bigger in crossection in compras to line and neutral.
The main ~~reason~~ fact is ~~that~~

$$R = \rho \frac{l}{a}$$

i.e, $R \propto \frac{1}{a}$.

or, $R \propto \frac{1}{a}$

Since in case of any fault w.r.t. the equipment earth it has to pass through least resistance path. so, this reason area of crossection made thicker. so, as the

area of cross section increases the resistance decreases and we are provid an easy path for earth fault current to flow.

The following are the advantages of using thick and long earth wire:—

(i) It doesn't allow incorrect plugging in a three pin socket.

(ii) It provide the sufficient contact are with the hollow pin of the socket whic reduces the contact resistance of the earth wire.

(iii) while plugging in, the earth wire makes earlier contact to the socket as compared with other two. Thus the metallic body of the appliances makes contact with the earth before energizing. Similarly, when removing from the socket it looses its contact at last.

2. Ans:

The clamps or connectors used for connecting two electrical devices are called as electrical lugs. use of cable lugs allow supply and distribution of electrical current without any interruption between electrical cables. Electrical lugs are used when permanent connection isn't possible between devices and cables.

easy installation, repair and maintenance of electrical devices or cables. most common use of lugs includs connecting one cable with another cable and connection more then two cables

3. Ans:

Personal protective equipment (PPE) refers to protective clothing, helmets, goggles or other garments or equipment designed to protect the wearer's body from injury or infection. the hazards addresse by protective equipment include physic electrical, heat, chemicals etc.

main PPEs used by electricians are: —

(I) Protective clothing : → protects the body from hazardous substance like hot oil, water, welding spark etc.

(II) Helmet → most important part of human body is the head. it needs utmost protection which is provided by a hard plastic helmet.

(III) Safety shoes: — made of hard metals

(IV) safety hand gloves: —

(V) Goggles: — used for eye protection.

(VI) Ear plug :-

(VII) Face mask

(VIII) chemical suit.

section-C

1. Ans:

In series connection bulb with high power dissipation glow brighter.

Power, $P = VI = I^2R = \frac{V^2}{R}$

Bulb resistance, $R_{60W} = \frac{V^2}{P} = \frac{240^2}{60} = 960$

$$R_{25W} = \frac{240^2}{25} = 2304\ \Omega$$

current, $I = \frac{V}{R_{60} + R_{100}} = \frac{240}{960 + 2304}$

$= 0.073\ A$

Power dissipation, $P_{60W} = I^2R = (0.073)^2 \times 9$

$= 5.11\ W$

$P_{25W} = I^2R = (0.073)^2 \times 23$

$= 12.27\ W$

$P_{25W} > P_{100W}$

So, 25W bulb glow brighter than 25W.

Ans: —

The main function of electrical hand drill machine is that a special drill makes rotational movements and penetrates the surface of the material, as a result we obtain the required hole.

Parts of electrical drill machines: —

(I) chuck: — It is used to hold the symmetry object with radial symmetry. In drill it holds the rotating tools.

(II) AC or DC motor → used for generate the rotation. The idea is to maxim the torque at the chuck, this is achieved by gear arrangement, where the driven gear has many more teeth then, the driving gear. To generate the rotation, turn the supply to motor and armature co from the control switch.

(III) Polarity reversal switch that chan the direction of rotation of the motor.

3. Ans:

Home appliances are connected in parallel to provide equal supply voltage to all. secon if one appliance is removed it would not affect the condition of others. In series if one appliance is open the complete ckt would be open.

Registration No.....

SCHOOL OF ELECTRICAL SKILLS
FIRST SEMESTER EXAMINATION-2017
SUMMER SEMESTER, B.VOC PROGRAM

Course Code: ELE1002 Time: 1 Hour

Course Name: Electrical Technician Max. Marks: 20

Instructions: Answer all questions from section A, each question carries one mark. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks.

Section A (5X1=5)

1 Kilowatt hour is unit of Electric

(a) Energy
(b) Power
(c) Work
(d) None of above

2 The resistance of all pure metels with rise of temperature will

(a) Decreases
(b) Increases
(c) Constant
(d) None of above

3 Electrical symbol of fixed resistance is

(a) —/\/\/\/\—

(b) —\/\/\/—

(c) 

(d) None of above

4 The resistance of voltmeter is

(a) Very low
(b) Very high
(c) Variable
(d) None of above

5 The potential of earth is.

(a) High
(b) Low

	(c) Zero (d) None of above

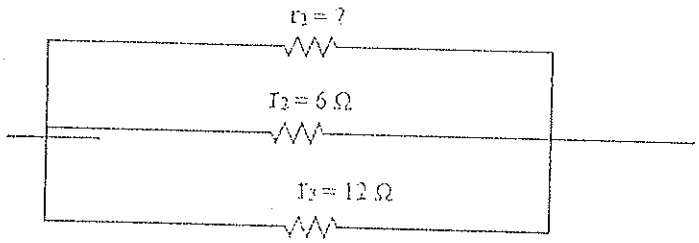
Section B

(3X2=6)

1	What will happen when a voltmeter is connected in the series of the load of a circuit?
2	Why the resistance of a given wire is inversely proportional to its cross sectional area?
3.	Why the body of electrical appliances is earthed?

Section C

(3X3=9)

1	What do you understand by the terms short circuit and open circuit in an electric system? Explain with examples.
2	The total resistance of circuit diagram shown is 2 Ω. Calculate the resistance of r_1. 
3	Five dry cells of emf. 1.5V each have internal resistance of 0.2, 0.3, 0.4, 0.5 and 1.2 ohms. When connected in series what current will these five cells furnish through 10 Ω resistances? What current would they have if short circuited?

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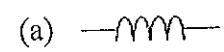
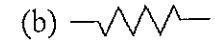
Section A (5X1=5)

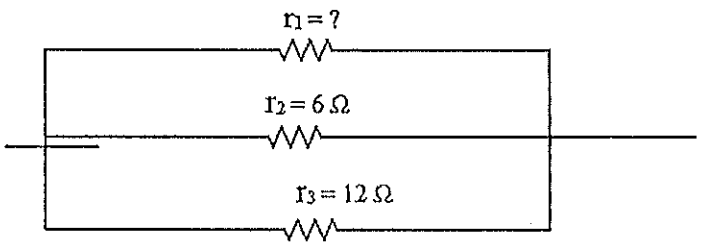
1	Kilowatt hour is unit of Electric (a) Energy (b) Power (c) Work (d) None of above
2	The resistance of all pure metels with rise of temperature will (a) Decreases (b) Increases (c) Constant (d) None of above
3	Electrical symbol of fixed resistance is (a)  (b)  (c)  (d) None of above
4	The resistance of voltmeter is (a) Very low (b) Very high (c) Variable (d) None of above
5	The potential of earth is. (a) High (b) Low

	(c) Zero (d) None of above

Section B (3X2=6)

1	What will happen when a voltmeter is connected in the series of the load of a circuit?
2	Why the resistance of a given wire is inversely proportional to its cross sectional area?
3.	Why the body of electrical appliances is earthed?

Section C (3X3=9)

1	What do you understand by the terms short circuit and open circuit in an electric system? Explain with examples.
2	The total resistance of circuit diagram shown is 2 Ω. Calculate the resistance of r_1. 
3	Five dry cells of emf. 1.5V each have internal resistance of 0.2, 0.3, 0.4, 0.5 and 1.2 ohms. When connected in series what current will these five cells furnish through 10 Ω resistances? What current would they have if short circuited?

electrical appliance

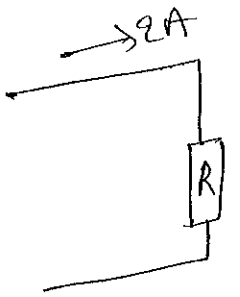
Section C

1: Ans:— Short ckt:— A short ckt is when no voltage is dropped across a ckt element.

special case (Resistor):

For resistive element, a short ckt also implies by ohm's law that there is no resistance or very little resistance.

Example:—

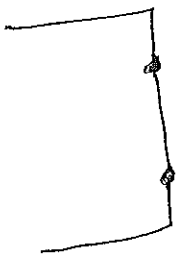


$V = IR$

$0 \text{ volt} = (2A)R$

$R = \frac{0 \text{ Volts}}{2A} = 0\Omega$

So, no resistance here it means we replace the resistance by a wire so, that no val. drop..

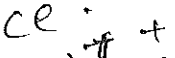


Open ckt:— An open ckt is when current flows through a ckt ele

special case (Resistor):—

For a resistive element, an open ckt also by ohm's law that there is an infini resistance:

$I = \frac{V_{AB}}{R} =$



ex:—

Section A

1 (a) Energy , Power .

| 1 watt = 1 J |

2 (b) Increases

3 (a) ~~~

4 (b) Very High resistance

5. (c) Zero potential.

Section-B

1. Ans:- If you connect valtameter in series (h a high resistance) then it will block the most of current passing through th clct.

If you connect ammeter in parallel (h a low resistance) then it will cre a short clct

2. Ans: —

$R = \rho \frac{l}{A}$ → Resistance is inversely proportional area of cross section. Larger will be area lower will be resistance and vice versa. So, Conductor with large cross section, current can easly flow and hence r tance is low.

3. Ans:

The metalic body of electrical appliances is connected to the earth wire so that an leakage of electric current is transferr to the ground. This prevents severe ele. shock to the user. That is why earthing of

$$\frac{1}{R_{eq}} = \frac{1}{r_1} + \frac{1}{r_2} + \frac{1}{r_3}$$

$$\therefore \frac{1}{2} = \frac{1}{r_1} + \frac{1}{6} + \frac{1}{12}$$

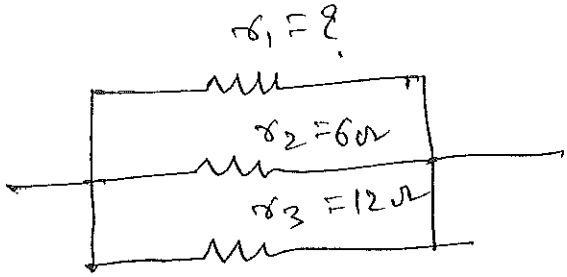
$$\frac{12 + 2r_1 + r_1}{12r_1}$$

$$\text{or, } \frac{1}{2} = \frac{12 + 3r_1}{12r_1}$$

$$\text{or, } 12r_1 = 24 + 6r_1$$

$$\text{or, } 6r_1 = 24$$

$$r_1 = 4\,\Omega.$$



3. Ans.

Total internal resistance $= (0.2 + 0.3 + 0.4 + 0.5 + 1.2)\,\Omega$
$= 2.6\,\Omega$

Total resistance $= 10 + 2.6 = 12.6\,\Omega$

Total volt. $= 5 \times 1.5 = 7.5\,V$

$$I = \frac{V}{R} = \frac{7.5}{12.6} = \underline{0.59 \text{ amp}}. \quad \underline{\text{Ans.}}$$

If o/p is shorted, o/p resist. is zero, only internal resistance remains!
So, total resist $= 2.6\,\Omega$

$$I = \frac{7.5}{2.6} = \underline{2.9 \text{ amp}} \quad \underline{\text{Ans.}}$$

Registration No.......................

SCHOOL OF ELECTRICAL SKILLS
FIRST SEMESTER EXAMINATION-2017
SUMMER SEMESTER, B.VOC PROGRAM

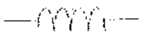
Course Code: ELE1003 **Time: 1 Hour**

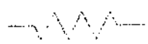
Course Name: Maintenance Technician Electrical **Max. Marks: 20**

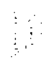
Instructions: Answer all questions from section A, each question carries one marks. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks.

Section A (5X1=5)

1 Electrical symbol of transformer is

(a) 

(b) 

(c) 

(d) None of above

2 The on/off switch in the house wiring is always connected in

(a) Phase
(b) Neutral
(c) Earth
(d) None of these

3 The resistance of conductor increases if

(a) length is increased
(b) Cross section area decreases
(c) Temperature is raised.
(d) All of above

4 Resistance is an

(a) Active device
(b) Passive device
(c) Unilateral device
(d) None of above

5 In our country power is generated at the frequency of

(a) 60 cycle/sec
(b) 50 cycle/sec

	(c) 100 cycle/sec (d) 200 cycle/sec

Section B (3X2=6)

1	Name the three factors which determine the resistance of a conductor.
2	Why Ammeters & volt meters practically, not consume any electric energy in a circuit.
3	What is the difference between direct current and alternating current?

Section C (3X3=9)

1	Explain the word transistor clearly show the biasing arrangement of the PNP & NPN transistor for conduction.
2	Explain the following terms (a) flux (b) mmf and (c) reluctance
3	5 bulbs of 100 W each and two geysers of 2000 W each work on the average for 2 hrs a day. If the energy cost Rs. 6.00 per KWh, calculate monthly bill of energy.

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SUMMER SEMESTER, B.VOC PROGRAM

Course Code: ELE1003 **Time: 1 Hour**

Course Name: Maintenance Technician Electrical **Max. Marks: 20**

Instructions: Answer all questions from section A, each question carries one marks. Answer all questions from section B, each question carries two marks. Answer all questions from section C, each question carries three marks.

Section A (5X1=5)

1	Electrical symbol of transformer is (a)  (b)  (c)  (d) None of above
2	The on/off switch in the house wiring is always connected in (a) Phase (b) Neutral (c) Earth (d) None of these
3	The resistance of conductor increases if (a) length is increased (b) Cross section area decreases (c) Temperature is raised. (d) All of above
4	Resistance is an (a) Active device (b) Passive device (c) Unilateral device (d) None of above
5	In our country power is generated at the frequency of (a) 60 cycle/sec (b) 50 cycle/sec

	(c) 100 cycle/sec (d) 200 cycle/sec

Section B (3X2=6)

1	Name the three factors which determine the resistance of a conductor.
2	Why Ammeters & volt meters practically, not consume any electric energy in a circuit?
3	What is the difference between direct current and alternating current?

Section C (3X3=9)

1	Explain the word transistor clearly show the biasing arrangement of the PNP & NPN transistor for conduction.
2	Explain the following terms (a) flux (b) mmf and (c) reluctance
3	5 bulbs of 100 W each and two geysers of 2000 W each work on the average for 2 hrs a day. If the energy cost Rs. 6.00 per KWh, calculate monthly bill of energy.

Maintenance Technician Electrical

Course code: ELE 1003

Section - A

1. Ans – (c)
2. Ans – (a)
3. Ans – (d)
4. Ans – (b)
5. Ans – (b)

Section - B

1. Ans :-

Following are the three factors th determine the resistance of a conducte ① length of wire ② cross sectional area ③ specific

(i) Resistance is proportional to length. As length of wire increases, the resistar increases ie, current decreases.

(ii) Resistance is inversely proportional cross-sectional area. The bigger th cross-sectional area of the wire the greater the no. of electrons the experience, ie, current is high.

(iii) Resistance increases with the temper re of wire. The hotter wire h

a larger resistance. because of increa
vibration of the atom lattice.

2. Ans:—

The valtameter is constructed in such
way that it has very high value o
resistance. Voltameter needs to be
connected in parallel, so that it
draws a very little current due
its high resistance and the devic
power consumption is very less.
For an ideal valtameter we have resista
to be infinity and hence current
drawn to be zero so there will be n
power loss in the instrument. But
this is not achievable practically as
can't have a material which has
infinite resistance.
Likewise an ammeter is connected
series. For an ideal ammeter, it n
have zero impedence so that it
zero val. drop across it, so the po
loss in the instrument is zero.
But the ideal is not achievable pr
cally.

3. Ans:

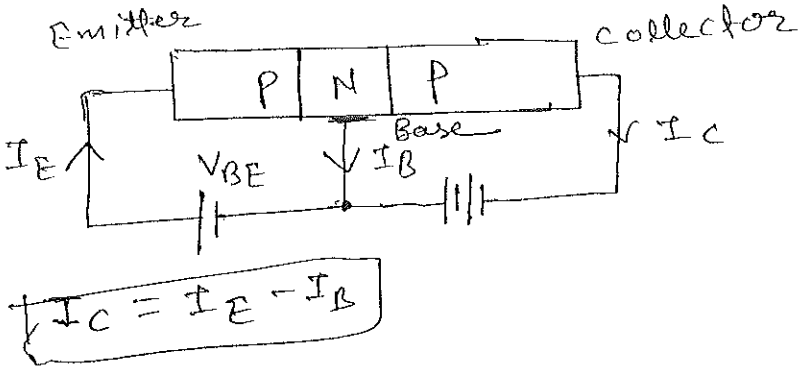
In direct current (DC), the electric current
flows in one direction where as in alter
current (AC) the direction changes periodic

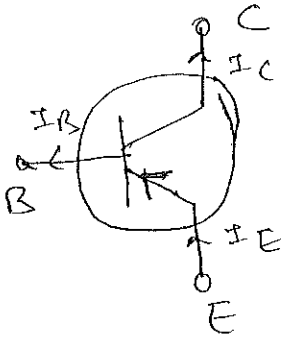
Section C

1. Ans:—

The BJT is a three layer, three termi and two junction semiconductor device the transistors are mainly used for tw basic functions such as switching ar amplification.

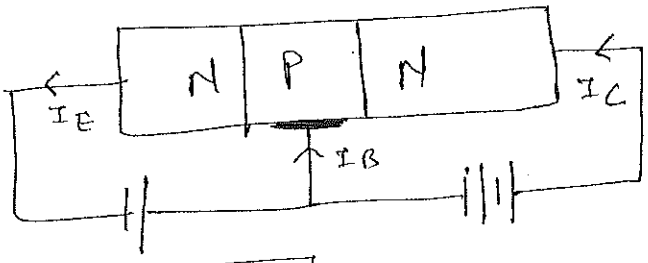
(1) PNP :—

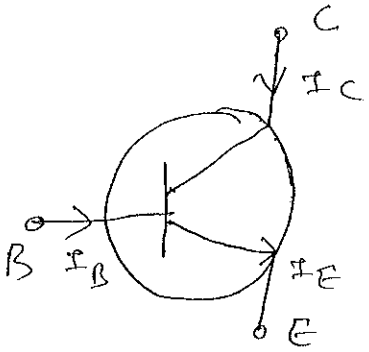




$$I_C = I_E - I_B$$

(2) NPN:—





$$I_C = I_E - I_B$$

2. Ans :—

(a) Ans: - The amount of magnetic lines of setup in a magnetic ckt is called ma flux.

or, It is the no. of magnetic field lines p through a surface (such as loop or wire).

(b) mmf :— Similar to the way that electro force (EMF) drives a current of electr

—charge in electrical ckts, magnetomotive force (MMF) drives magnetic flux through magnetic ckts. $mmf = \mathcal{F} = NI$ = amp turns.

(c) reluctance: — Magnetic reluctance, or magnetic resistance, is a concept used in the analysis of magnetic ckt. It is analogous to resistance in an electrical ckt, but rather than dissipating electrical energy it stores magnetic energy.

or, opposition offered by magnetic ckt to magnetic flux is called reluctance.

$$S = \frac{l}{\mu A}$$

3. Ans: —

5. bulb 100 watt each = $5 \times 100 = 500W$

2 geysers $\times$ 2000W = 4000W

Total load = 4500W = 4.50kW

For load 1kWh;

Bulb load/day = $500 \times 2 = 1000Wh = 1kWh$

Geysers load/day = $4000 \times 2 = 8000Wh = 8kWh$

Bulb & Geyser consumption/month = $(1+8) \times 3$
$= 270$

Cost @ 6kWh = 270×6

= RS 1620/ month.