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# ***Instruction for effective study at home***

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Dear students follow subject wise instructions for active and effective study at home.

## **Biology/Computer**

- Practice of all cycles (flow sheet diagrams) of all units (1, 5, 6, and 7) on separate sheets.
- Learn long questions from text book with headings and subheading.
- Prepare notes of all long questions after learning.
- Book reading is compulsory for objective (construct 30 MSQs from each unit).
- Practice diagrams of all unit on sheets.

## **Chemistry**

- Learn and solve all test yourself from each unit on separate sheets and prepare your notes.
- Learn and solve complete exercise of each unit on separate sheets and prepare your notes.
- Learn yellow and pink boxes in terms of objective.
- Book reading is compulsory for objective (construct 30 MSQs from each unit).
- Learn all long questions from exercise of each unit and write them of sheets in the form of notes.
- Solve numerical and examples of unit 1 and 5.

## **Physics**

- Learn all formation boxes of including values from each unit.
- Learn Tables of units from unit 1.
- Solve mini exercise from each unit on separate sheets and prepare notes.
- Solve problems and examples from each units and practice on separate sheets.
- Practice derivation of equations of linear motions from unit 2.
- Learn topic wise long questions. From unit 3 and 4.

## **Mathematics**

- Practice all questions from each exercise.
- Learn all definitions from each unit and write them on sheets.
- Practice all theorems of unit 12 on sheets.
- Prepare unit 10 and 11 for definition.

## **Urdu/English**

- Watch linked videos and write all letters, applications, stories and dialogues of urdu and English.
- Read daily one unit of urdu and English and solve their exercise.

**Pak study/ Islamic study.**

- Learn all long questions from exercises of unit 1& 2 Pak study with heading and sub heading.
- Read complete unit 1 & 2 and write all dates with events on separate sheets.
- Prepare your 40 MCQs from each unit of Pak study.
- Learning words meaning from exercise of all **RUKOO. Of SURAH's.**
- Learn Translations **SURAH'S**
- Learn and write **AHADEET**

**BEST OF LUCK**

**THE PUNJAB SCHOOL**

**DEFECNCE ROAD CAMPUS (DRC)**

**JUBBLI TOWN CAMPUS (JTC)**



# باب نمبر 1

## بنیادی عقائد

سوال نمبر 1: انسانی زندگی پر عقیدہ ۶ توحید کے اثرات کا جائزہ لیں؟

• توحید کا مفہوم:

اسلامی عقائد میں سب سے پہلے عقیدہ توحید کا شمار ہوتا ہے۔ توحید کے لغوی معنی مندرجہ ذیل ہیں۔

• لغوی معنی:

توحید کے لغوی معنی ہیں "ایک ماننا"۔ شریعت کی اصطلاح میں توحید سے مراد ہے کہ اللہ انہی ذات، صفات اور عبادات میں ایک ہے۔ اس کا کوئی شریک نہیں نیز اس کو یہی عبادت کے لائق سمجھنا۔

\* انسانی زندگی پر عقیدہ ۶ توحید کے اثرات

عقیدہ ۶ توحید انسانی زندگی پر بے شمار اثرات مرتب کرتا ہے۔ ان میں سے چند مندرجہ ذیل ہیں۔

● اخوت و اتحاد : عقیدہ ۶۵ توحید اخوت و اتحاد کا درس

دیتا ہے۔ اسلام سے قبل ساری دنیا مختلف طبقات میں تقسیم تھی۔ لیکن عقیدہ ۶۵ توحید نے اس منتشر انسانیت کو ایک پلیٹ فارم پر جمع کر دیا۔

● ارشادِ پاک : ارشاد ہوا:

انما المؤمنون اخوة  
”بے شک مسلمان بھائی بھائی ہیں“

● مخلوقِ خدا سے ہمدردی :

عقیدہ ۶۵ توحید مخلوقِ خدا سے ہمدردی اور شفقت سے پیش آنے کی تعلیم دیتا ہے۔ عقیدہ ۶۵ توحید انسان کی تربیت کرتا ہے، کہ وہ ایک دوسرے سے کام آئیں۔ کیونکہ اللہ کے بندوں سے محبت نجات کا ذریعہ ہے۔ کسی نے کیا خوب کہا ہے۔

خبر میر بانی تم اہل زمین پر  
خدا میراں ہو گا غرض بیزاری پر

● حدیثِ پاک :

حدیثِ پاک میں فرمایا گیا ہے ،

## • اطمینانِ قلب :

عقیدہ : توحید کا امام تیر والا، مالوس اور نا اُمید نہیں ہوتا۔ وہ ہر وقت اللہ کی رحمت پر آس لگائے رکھتا ہے۔ انسان جس قدر دل کو اللہ کی طرف متوجہ کرتا ہے، اُس کے دل کو اسی قدر اطمینان ملتا ہے۔

• ارشادِ ہوا: **الَا يَذِكرُ اللّٰهُ تَطْمِئِنُّ الْقُلُوبُ ط**  
ترجمہ 4: (اعدہ 28 پ 3)

”بے شک دلوں کا اطمینان اللہ سے ذکر میں ہے۔“

## • پرہیزگاری :

عقیدہ : توحید سے انسان کے دل میں پرہیزگاری پیدا ہوتی ہے۔ اس کی وجہ یہ ہے کہ ہر مومن کا ایمان ہے کہ اللہ اسٹی تمام ظہر اور پوشیدہ باتوں کو جانتا ہے۔

← جب انسان ساری دنیا سے بھپ کر کوئی گناہ سر انجام دیتا ہے، یعنی چوری، ڈاکہ، قتل وغیرہ تو اللہ تعالیٰ فرماتا ہے:

”اے ابن آدم! تھے ساری دنیا میں میں ہی اتنا حقیر لگا کہ تو نے سب سے بھپ کر گناہ کرنا پسند کیا بس ایت میرا پردہ نہ کیا“

وَسَوَّرْنَا لَكُمْ مَّا فِي السَّمَوَاتِ وَمَا فِي

الْأَرْضِ جَمِيعًا مِّنْهُ ط

(سورة جاثية ۳۱-۳۵)

ترجمہ:

اور آسمانوں اور زمین میں جو کچھ  
ہے اس نے تمہارے لیے مسخر کر دیا۔

● بہادری:

اللہ پر ایمان لانے سے استقامت اور بہادری  
پیدا ہوتی ہے۔ مومن جانتا ہے کہ پرچیز اللہ کی مخلوق اور  
محتلج ہے۔ اس عقیدے کے ذریعے مومن استقامت و بہادری  
کی تصویر بن جاتا ہے۔ اسی لیے مستلمانوں کو قرآن پاک میں  
یہ دعا سکھائی گئی ہے۔

دُعا: وَثَبَّتْ أَقْدَامَنَا وَالْفُرْتَا عَلَى الْقَوْمِ

الْكَافِرِينَ - (البقرہ: 250 پی)

ترجمہ:

”اور ہمارے قدموں کو مضبوط رکھ اور  
کفار کے مقابلے میں ہماری مدد فرما“

جب پریزگاری کا جذبہ انسان میں پیدا ہوتا ہے، تو وہ کثرت سے نیک اعمال کرنے کی کوشش کرتا ہے۔ ارشاد ہوا:

**إِنَّ اللَّهَ يُحِبُّ الْمُتَّقِينَ**

ترجمہ:

”بے شک اللہ پریزگاروں کو دوست رکھتا ہے۔“

• **محبتِ الہی:**

اللہ پر ایمان لانے سے مومن محبتِ الہی

کا پیکر بن جاتا ہے، وہ دنیا کی تمام محبتوں کو بھلا کر اللہ کی محبت میں کھو جاتا ہے۔

• **ارشادِ ربانی:**

**وَالَّذِينَ آمَنُوا أَشَدُّ حُبًّا لِلَّهِ**

(لوقہ 65 اپنی)

ترجمہ:

”اور ایمان والے سب سے زیادہ اللہ سے محبت کرتے ہیں۔“

• **توکل:**

یعنی اللہ پر بھروسہ ایسا جذبہ ہے جو مسلمان کو دنیا اور آخرت میں کامیابی دلواتا ہے۔ اور عقیدہ ۶ توحید توکل پیدا کرنے میں اہم کردار ادا کرتا ہے۔

• ارشادِ زبانی:

وَتَوَكَّلْ عَلَى اللَّهِ

(احزاب 3 پ 2)

اور خدا پر بھروسہ رکھو

ترجمہ:

∞ جھک کہ مانگو تو موتی ملیں گے تمہیں  
تو جو کرتا صراپے وہ سنتا خدا ہے

(مینیہ ناصر)



(ix)

## DIFFERENCE BETWEEN NOISE                      MUSIC

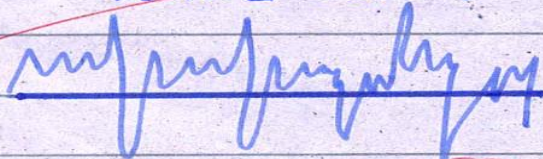
“Such sounds which have jarring effects on our ~~ear~~<sup>mind</sup>, are called noise.”

- Their frequency & amplitude do ~~not~~ change in ~~regular~~ manner.

### EXAMPLES

- Sound of heavy traffic.
- Sound of hammering in traffic and industries.

(WAVE FORM)



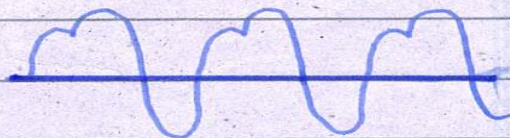
“Such sounds which have pleasant effects on our ~~ears~~ are called music.”

- Their frequency & amplitude change in ~~regular~~ manner.

### EXAMPLES

- Sound of sitar or piano or flute.

(WAVE FORM)



92

(ii)

## UNIT OF RESISTANCE

Unit of resistance is ohm which is represented by greek letter ( $\Omega$ ) omega.

## OHM

Def A conductor would have a resistance of one ohm, if one ampere current passes through it when potential difference of one volt is applied across its ends.

## OTHER UNITS

Other units are.

$$1\text{M}\Omega = 1\text{Mega Ohm} = 10^6 \Omega$$

$$1\text{K}\Omega = 1\text{Kilo ohm} = 10^3 \Omega$$

$$1\text{m}\Omega = 1\text{milliohm} = 10^{-3} \Omega$$

$$1\mu\Omega = 1\text{microhm} = 10^{-6} \Omega$$

(iii)

### MUTUAL INDUCTION

—<sup>o</sup> If a current is induced in a circuit due to the change of current in another circuit, then this phenomena is known as mutual induction<sup>o</sup>

### COILS

Two coils are usually used in mutual induction. The coil in which change in current induces current in another coil, is called "primary coil" while the coil in which current is induced is called "secondary coil".

### APPLICATION

Transformer works on the principle of mutual induction.

## MATHEMATICALLY

Mathematically it is expressed as:

$$W = I^2 R t$$

where,

W = amount of energy

I = current.

R = Resistance.

t = Time duration.

(v)

## ISOTOPIES

cp Isotopes are the atoms of same element which have same atomic numbers but their atomic masses are different ??

## EXAMPLE

Hydrogen element has three

isotopes:

- Protium ( ${}^1_1\text{H}$ ) (1 proton, 0 neutron, 1 electron)
- Deuterium ( ${}^2_1\text{H}$ ) (1 proton, 1 neutron, 1 electron)

(iv)

FLEMING'S LEFT HAND RULE

∴ According to Fleming's left hand rule, if we stretch the thumb, forefinger and middle finger of left hand mutually at right angles to each other, if middle finger points in the direction of magnetic field, forefinger in direction of current, then thumb would indicate the direction of force acting on a conductor ∴

(vii)

JOULE'S LAW

∴ The amount of heat energy generated in a resistance due to flow of electric current is equal to product of square of current  $I$ , resistance  $R$  and the time duration  $t$ . This is known as Joule's Law ∴

## MATHEMATICALLY

Mathematically it is expressed as:

$$W = I^2 R t$$

where,

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I = current

R = Resistance

t = Time duration

(v)

## ISOTOPES

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(xxii)

## PRINCIPLE OF RESISTANCE THERMOMETER

" By taking measurements of the resistance of a substance for known value of " $\alpha$ " at different temperatures, it is possible to measure the temperature. It is the principle on which resistance thermometer works "

### MATHEMATICALLY

Mathematical expression for calculation of temperature is:

$$t = \frac{R_t - R_0}{R_0 \alpha}$$

where,  $t$  = temperature of substance.

$R_t$  = Resistance at  $t^\circ\text{C}$

$R_0$  = Resistance at  $0^\circ\text{C}$

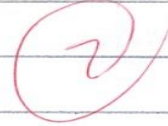
$\alpha$  = constant which is rate of

(xviii)

### RIGHT HAND RULE FOR STRAIGHT CONDUCTOR

According to right hand rule,

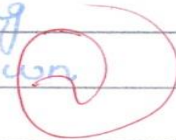
"If we grasp the straight current carrying conductor in our right hand with the thumb being stretched in the direction of current, then ~~(erected thumb would indicate)~~ fingers would curl in the direction of lines of the force"



(x)

### GRAPHIC DESIGNING

"The process to draw required lines and pictures on the computer screen by using mouse or keyboard is known as graphic designing"





(xix)

DIFFERENCE BETWEEN  
ATOMIC                      ATOMIC  
NUMBER                      MASS

∴ The mass of protons present in a nucleus or the number of protons present in nucleus is known as atomic number ∴

- It is represented by Z.

EXAMPLE

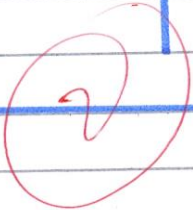
Atomic number of hydrogen and carbon is 1 and 6 respectively.

∴ The mass of protons & neutrons present in a nucleus or their total number is known as atomic mass ∴.

- It is represented by A.

EXAMPLE

Atomic mass of hydrogen and carbon is 1 and 12 respectively.



(xii)

### CONDITIONS FOR FORWARD BIASING

Two conditions are necessary for forward biasing.

- The anode 'p-part' of conductor should be connect with +ve terminal of battery and ~~cathode~~ with -ve terminal.
- The voltage of battery should be greater than internal potential barrier so that it may provide a requisite amount of energy to charge carriers to overcome potential barrier.

(xiii)

### FARADAY'S LAW OF ELECTROMAGNETIC INDUCTION

Faraday discovered it in 1831.

∴ The value of induced emf is directly proportional to the rate of change of the magnetic flux. This is known as electromagnetic induction.

## Law of Faraday

(xvii)

### SPECIFIC RESISTANCE

Resistance of one metre cube of a substance is known as specific resistance. It is represented by ' $\rho$ '.

### MATHEMATICALLY

Mathematically,

$$\rho = \frac{RA}{L}$$

where,  $R$  = resistance of substance.  
 $A$  = area of substance  
 $L$  = length of substance.

### UNIT

Unit of specific resistance is ohm-metre. ( $\Omega m$ ).

### EXAMPLE

Specific resistance of copper is  $1.69 \times 10^{-8} \Omega m$ .

(xiv)

## TRANSFORMER

"Transformer is an electrical device which is used to increase or decrease the value of the alternating voltage."

### PRINCIPLE

It works on the principle of "mutual induction"

### TYPES

It is of two types.

- Step-up transformer
- Step-down transformer.

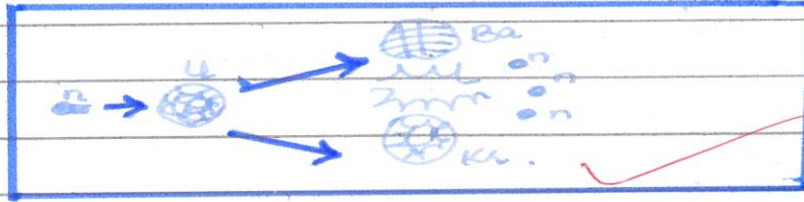
(vi)

## NUCLEAR FISSION

"Breaking of nucleus into two parts with the release of large amount of energy is known as nuclear fission."

## EXAMPLE

If slow neutron is bombarded with Uranium, it breaks into two parts with 3 neutrons and energy.



Fission reaction can be controlled.

(xvi)

## DIFFERENCE BETWEEN

### STABLE NUCLIDES

Nuclei which do not emit radiations naturally are known as stable nuclides.

### UNSTABLE NUCLIDES

Nuclei which emit radiations naturally and hence are converted into another element, are known as unstable nuclides.

## REQUIRED DATA

Power consumed by electric bulb  
 $= P = ?$

## SOLUTION

We know that,  
According to ohm's Law,

$$V = IR$$

$$\Rightarrow I = \frac{V}{R}$$

By putting values, we get

$$I = \frac{250}{500}$$

$$I = 0.5 \text{ A}$$



Now,

$$P = VI$$

By putting values, we get,

$$P = (250)(0.5)$$

$$P = 125 \text{ watt}$$

$$P = 125 \text{ W.}$$

## RESULT

Power consumed by electric bulb is **125W**.

(a)

## PROPERTIES OF $\beta$ -RAYS

$\beta$ -rays are the particles which are emitted by nucleus of radioactive elements. It shows the following properties:

### (i) SPEED

$\beta$ -rays are emitted by radioactive elements which move with great speed. Their speed ranges about 98% to that of speed of light. The speed of  $\beta$ -rays emitted from different elements is different. The speed of  $\beta$ -rays emitted from same element is also not same.

# Q-5

(b)

Half life of ----- years?

## GIVEN DATA

Half life of radium =  $T = 1600$  years.  
Total quantity of radium =  $120$  g.

## REQUIRED DATA

Quantity of radium left after  
4800 years = ?

## SOLUTION

Half life of radium is 1600 years.  
Now, we have to find number of  
half life after 4800 years.

$$\text{No. of half life} = \frac{4800}{1600} = 3 \text{ half lives (4)}$$

Now,

$$\text{Quantity of radium left after first half life} = \frac{120}{2} = 60 \text{ g.}$$



Quantity of radium left after  
second half life  $2T = \frac{60}{2} = 30g$ .

Quantity of radium left after  
third half life  $3T$  (4800 years) =  $\frac{30}{2}$   
= **15g**.

### RESULT

Quantity of radium left after  
4800 years = 15g.

---

5

(a)

## TRANSFORMER

"Transformer is an electric device which is used to increase or decrease the value of alternating voltage".

### PRINCIPLE

Transformer works on the principle of "mutual induction".

### CONSTRUCTION

Transformer consists of two coils which are wound on the two sides of a rectangular iron core. coils are of two types:

- Primary coil.
- Secondary coil.

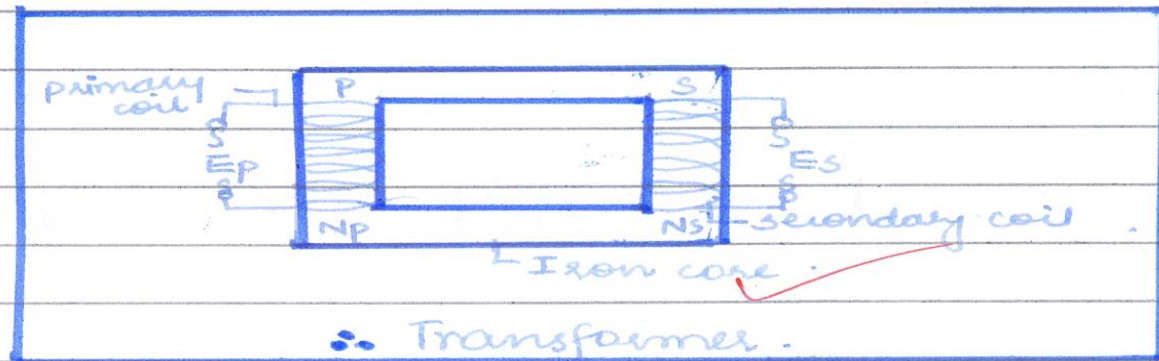
### PRIMARY COIL

"The coil in which alternating voltage is supplied whose value is to be altered is called as

primary coil

## SECONDARY COIL

The coil at which altered required voltage is obtained is known as secondary coil



## WORKING

The alternating voltage whose value is to be altered is supplied to primary coil. This coil voltage is supplied which causes the magnetic field to build up and magnetic flux to change.

This change in the magnetic flux increases and iron core enhances this change in number

of lines of force passing through primary coil and also concentrates it that the whole magnetic flux is also linked up with the secondary coil. Due to phenomena of mutual induction, voltage is also induced in secondary coil. Usually, the following relation is obtained,

$$\frac{E_s}{E_p} = \frac{N_s}{N_p}$$

where,  $E_s$  = voltage at secondary coil.

$E_p$  = voltage applied at primary coil.

$N_s$  = No. of turns of coil in secondary.

$N_p$  = No. of turns of coil in primary.

## TYPES

There are two types of transformer.

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$N_p$  = No. of turns of coil in primary.

## TYPES

There are two types of transformer.

- (i) Step-up transformer.
- (ii) Step-down transformer.

### (i) STEP-UP TRANSFORMER

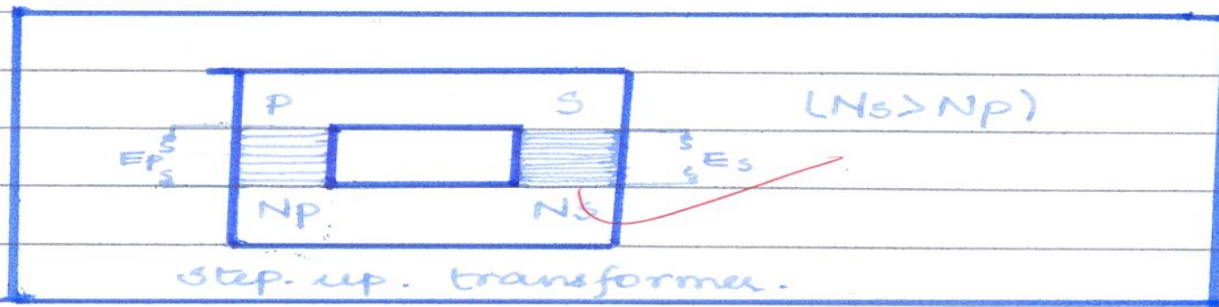
Def In step-up transformer, the no. of turns in secondary coil is larger than that of primary coil. It is used to increase the value of alternating voltage.

In this,

$$N_s > N_p$$

as we have to obtain

$$E_s > E_p$$



(ii)

### STEP-DOWN TRANSFORMER

Def In step-down transformer, the no. of turns in secondary coil is less than that of

of primary coil. It is used to decrease the value of alternating voltage ??

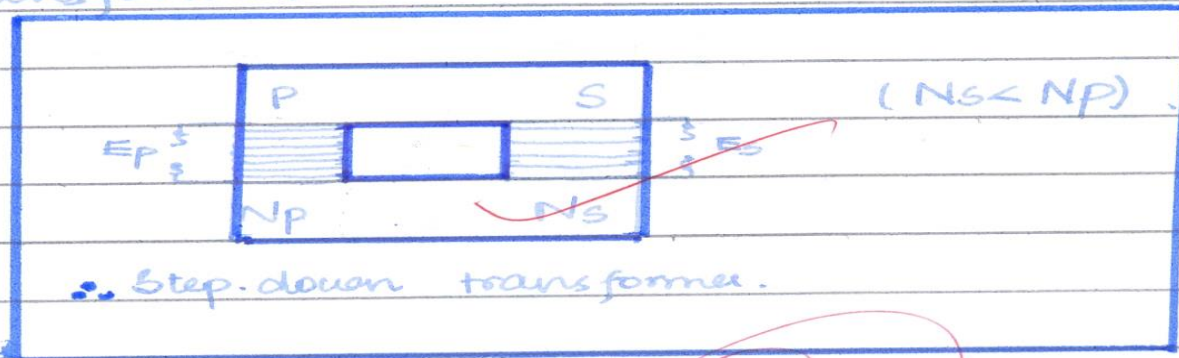
In this type,  $N_s$  should be less than  $N_p$

$$N_s < N_p$$

in order to get

$$E_s < E_p$$

These are the two types of transformer.



4