| Learning outcomes | Some sources in EKB | | |
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| | 🌐 Discovery | 𝕊𝕊 Britannica | 𝕊𝕊 Britannica |
| | | | |
| **Chapter one**<br><br>**Electric current- ohm᾽s law and Kirchhoff᾽s laws.**<br><br>1-Deduce the concept of ( Electric current – Potential difference – electric resistance). | https:// lms.ekb.eg/search?query=kirchhoff%20laws%20for%20electric%20circuits&strict=false&popupUri=%2FResource%2F65757265-6b61-656b-6233-303030333030 | https://lms.ekb.eg/playlists/view/86b4ff3e-ccb5-4235-b655-43a2a2005c67/en/1 | |
| 2-Discover the factors affecting on a resistance of a conductor | Kirchhoff᾽s laws | Electric current | |
| 3-Deduce the resistivity and the conductivity of a conductor | https://lms.ekb.eg/repository/resource/9d025f38-81c0-44ff-a91c-a449342cb78e/en | https://lms.ekb.eg/playlists/view/86b4ff3e-ccb5-4235-b655-43a2a2005c67/en/1 | |
| 4-Illustrate by drawing the way of the resistors connection (series – parallel). | series connection | Electric current | |
| 5-Calculate the equivalent resistance of group of resistors. | https://lms.ekb.eg/repository/resource/9a1b46cf-640d-4bc2-b0bf-56b3d811f269/en | https://lms.ekb.eg/playlists/view/eff49ee7-8f6e-4171-a3b9-0db78e-ae402e/en/1 | |
| 6-Apply the ohm᾽s law for closed circuit. | parallel connection | ohm's law | |
| 7-Deduce the relation between the electromotive force and the potential difference between two poles of a battery. | https://lms.ekb.eg/repository/resource/fdb18fe9-6bab-421f-b02d-b1717980dfde/en | https://lms.ekb.eg/playlists/view/69dfc7d4-abe2-4182-9117-b5fbb3153924/en/1 | |
| 8-Illustrate the effect of the resistors connection on the electric current and potential difference through the circuit. | Electric circuit | ohm's law (Home work) | |
| 9-Apply the kirchhoff᾽s laws on the electric circuits | | https://lms.ekb.eg/playlists/view/2520d248-524a-48e2-9df9-1d729fd57cb0/en/1 | |
| | | ohm›s law ( Practical -Home work) | |

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| | | https://lms.ekb.eg/playlists/view/2520d248-524a-48e2-9df9-1d729fd57cb0/en/1 | |
| | | ohm's law ( Practical -Home work) | |
| | https://lms.ekb.eg/repository/resource/4924ad4b-7d96-444a-92c2-6ab379e799b2/en | https://lms.ekb.eg/playlists/view/0346d07e-8197-4c34-bf96-a94bb66611e1/en/1 | |
| | Resistance | Solved examples | |
| | https://lms.ekb.eg/repository/resource/aca4b1d5-fefa-45cb-ae72-aeadb033c51e/en | https://lms.ekb.eg/playlists/view/a0d6a5cf-2125-4c57-bae1-3e52f5bc5e0a/en/1 | |
| | Parallel lamps | Problems on resistors | |

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| **Chapter two**<br>**Magnetic effect of the electric current.**<br>1-Calculate the magnetic flux density of a straight wire carrying a current.<br>2-Calculate the magnetic flux density of a circular loop carrying a current.<br>3-Calculate the magnetic flux density of a solenoid loop carrying a current.<br> 4-calculat the magnetic flux density at a point due to different conductors carrying electric current.<br>5- Determine the direction of magnetic flux of<br>a straight wire, circular coil and solenoid carrying a current.<br>6- deduce the factors affecting the magnetic flux density at a point near a straight wire, circular coil and solenoid carrying a current.<br>7- deduce the factors affecting the magnetic force which acts on a straight wire placed in magnetic field.<br>8- deduce the mutual force between two straight wires carrying a current. | https://lms.ekb.eg/repository/re-source/844dc351-875a-4e86-af47-a704d9595a48/en | https://lms.ekb.eg/playlists/view/7a65b54b-4b77-47ce-813c-22466310245f/en/1 | https://lms.ekb.eg/playlists/view/e4420b8f-a66a-4c42-a056-67f5484482d6/en/1 |
| | Electricity and magnetism part 2 | Magnetic flux density | Magnetic flux density |
| | https://lms.ekb.eg/repository/re-source/c3acdbb0-b23c-4ec3-8ca5-7e14326e7f28/en | https://lms.ekb.eg/playlists/view/a4ff55f0-e14a-4202-9cb6-688add51009d/en/1 | https://lms.ekb.eg/playlists/view/00ecc841-0481-47eb-9bae-f5f3bfd00cd7/en/1 |
| | Electricity and magetism part 1 | Galvanometer 2 | Galvanometer 1 |
| | https://lms.ekb.eg/repository/resource/64143430-0aa1-450e-9909-81f1b0c09f09/en | https://lms.ekb.eg/playlists/view/ec267c8f-4646-4108-a379-48be-ab295663/en/1 | https://lms.ekb.eg/playlists/view/fccc4a9a-7552-4fe9-ab66-4476964dfe27/en/1 |
| | Electromagnet. | Galvanometer 4 | Galvanometer 3 |
| | | https://lms.ekb.eg/playlists/view/9d220475-76cb-4112-b012-67d1d7d4128a/en/1 | https://lms.ekb.eg/playlists/view/a70c14d9-4bfb-4ba5-b836-602f12ef-5b8e/en/1 |
| | | DC ohmmeter and multi meter 2 | DC ohmmeter and multi meter 2 |
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| 9-Apply the fleming's left rule.<br><br>10- calculate the torque acting on a rectangular coil carrying electric current placed in a magnetic field.<br><br>11- Illustrate the structure , the idea of work for moving coil galvanometer and calculate its sensitivity .<br><br>12-deduce the way to convert the galvanometer into ammeter and recognize the role of shunt resistance.<br><br>13- deduce the way to convert the galvanometer into voltmeter and recognize the role of multiplier resistance.<br><br>14- deduce the way to convert the galvanometer into ohmmeter and measure the resistance of an unknown resistor. | | https://lms.ekb.eg/playlists/view/27446e71-7b07-469a-b915-5d795f3707c7/en/1 | https://lms.ekb.eg/playlists/view/2517f351-d34d-4ffa-a2ba-d3dd33db4242/en/1 |
| | | Solved examples on a rectangular coil carrying electric current placed in a magnetic field. | Solved examples on a rectangular coil carrying electric current placed in a magnetic field. |
| | | https://lms.ekb.eg/playlists/view/77a43145-42f6-494f-875e-f9b61b2b683e/en/1 | https://lms.ekb.eg/playlists/view/6df931ea-b313-40a8-9c94-9b04130df83c/en/1 |
| | | Ampere›s circular law | the magnetic force which acts on a straight wire placed in magnetic field. |
| | | https://lms.ekb.eg/playlists/view/0d1333fa-6c4a-4f02-97f1-7752d2e98459/en/1 | |
| | | the magnetic flux density of a circular loop carrying a current 1. | |
| | | playlists/view/2844877a-0747-4258-a362-2ffdf94afea7/en/1 | |
| | | the magnetic flux density of a circular loop carrying a current 2. | |
| | | https://lms.ekb.eg/playlists/view/6df931ea-b313-40a8-9c94-9b04130df83c/en/1 | |
| | | the magnetic force which acts on a straight wire placed in magnetic field 1 | |
| | | https://lms.ekb.eg/playlists/view/ba08896c-03f0-4a43-92f7-8aba8e2f6fc7/en/1 | |
| | | the magnetic force which acts on a straight wire placed in magnetic field 2 | |

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| **Chapter three :** **Electromagnetic Induction.** 1-Describe the electromagnetic induction phenomenon from faraday's experiments. 2-Deduce the factors affecting on the induced electromagnetic force produced in a straight wire. 3-Deduce the faraday'law. 4-Apply the lenz's rule. 5-Calculate the induced electromagnetic force Produced in a straight wire. 6- Apply the fleming's right hand rule. 7-Deduce the mutual induction between two wires. 8-Deduce the self induction of the coil. 9-Deduce the ways to generate eddy currents and their usage . identify the decreasing its effect in the electric instruments. 10-Illustrate the structure of dynamo and its idea of work. Calculate the induced electromagnetic force (instantaneous - maximum – effective – average) that produced from the dynamo. 11- Illustrate the structure of motor , its idea of work and its uses. | https://lms.ekb.eg/repository/re-source/28f5ae99-2ba8-4a72-9c52-4be7acd26e9b/en | https://lms.ekb.eg/playlists/view/56a7365c-2379-44e3-99c5-db-6b9ade20dc/en/1 | https://lms.ekb.eg/playlists/view/89f-8d57a-49da-4ec8-9466-6e541f1e05db/en/1 |
| | Electric Motors and Generators | transformers | the lenz›s rule. the fleming›s right hand rule part 2 |
| | https://lms.ekb.eg/repository/re-source/c852bd52-8dde-4ee6-81ae-d34eba884e8c/en | https://lms.ekb.eg/playlists/view/05ca20e4-bf29-465d-be17-311eedf35641/en/1 | https://lms.ekb.eg/playlists/view/ed26ede7-7a1f-4ba0-a6ee-c56a9c49b820/en/1 |
| | Transformer1 | the lenz's rule. the fleming's right hand rule part 1 | the lenz›s rule. the fleming›s right hand rule part 3 |
| | | https://lms.ekb.eg/playlists/view/3ce68c39-8301-4fe4-b20a-d4b20f079dbf/en/1 | https://lms.ekb.eg/playlists/view/ac28e7cc-bfb8-4e07-be4e-8e5e893d258e/en/1 |
| | | the induced electromagnetic force Produced in a straight wire1. | the electromagnetic induction 1 |
| | | https://lms.ekb.eg/playlists/view/5200b835-7f19-4aab-b121-4f3e4df002f1/en/1 | https://lms.ekb.eg/playlists/view/40039636-2dcb-448a-a61c-78b73ae001e8/en/1 |
| | | the induced electromagnetic force Produced in a straight wire2. | the electromagnetic induction 2 |
| | | https://lms.ekb.eg/playlists/view/281d2609-31a0-4b70-9bb1-efe1ec21c092/en/1 | https://lms.ekb.eg/playlists/view/b2a9e-cf3-7935-477a-9649-ee03df2c4bfd/en/1 |
| | | eddy currents1 | the electromagnetic induction 3 |

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| | Discovery | Britannica | Britannica |
| 12- Deduce the relation between the voltage and electric current in two coils of transformer. | | https://lms.ekb.eg/playlists/view/47d95583-6043-47c8-b3a9-d75a59f09258/en/1 | https://lms.ekb.eg/playlists/view/2c5a4065-c8bd-4c60-8440-4dc-c9c896c38/en/1 |
| 13- Deduce the way to increase of efficiency of transformer and calculating its value. | | eddy currents2 | the electromagnetic induction 4 |
| | | https://lms.ekb.eg/playlists/view/21e7a5dc-706e-4b84-8c29-1e0bf-0d8e43f/en/1 | https://lms.ekb.eg/playlists/view/15640ffc-6e4c-421d-8dca-d6f0f77f094d/en/1 |
| 14- Illustrate the structure of motor (DC) | | self induction coefficient of the coil. | AC generators1. |
| | | https://lms.ekb.eg/playlists/view/2de-25caa-ccba-4e43-a921-25a8dfbbbf5d/en/1 | https://lms.ekb.eg/playlists/view/3a91d29e-0116-4cb7-b240-d12f10d-1d4ec/en/1 |
| | | AC generators2. | AC generators3. |
| | | https://lms.ekb.eg/playlists/view/bc059288-f11c-4556-84a5-6b469ce43dd0/en/1 | https://lms.ekb.eg/playlists/view/af17e549-ba2f-416d-b93c-0c06b11e4a40/en/1 |
| | | self induction of the coil 1. | self induction of the coil 2. |
| | | | https://lms.ekb.eg/playlists/view/f8454725-6b97-41ea-a315-0a402551399e/en/1 |
| | | | the mutual induction between two wires 1. |
| | | | https://lms.ekb.eg/playlists/view/3a41bf85-39d7-484e-96a1-ee56e042a560/en/1 |
| | | | the mutual induction between two wires 2. |

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| **Chapter 4 :** **Alternating current circuts** 1- compare between alternating current and direct current. | | https://lms.ekb.eg/playlists/view/32220a35-3d7d-4bf3-a3b2-ac-47c46e8c73/en/1 | https://lms.ekb.eg/playlists/view/d7d75172-3bc4-4c2c-8725-d2cf-60185cbb/en/1 |
| 2- illustrate by drawing the structure of Hot wire ammeter and its idea of work. | | capacitive reactance | capacitive reactance |
| | | https://lms.ekb.eg/playlists/view/85afc251-141f-418b-8371-1f735f0b2f88/en/1 | https://lms.ekb.eg/playlists/view/217add95-769a-4269-bff7-d60a85ee9823/en/1 |
| 3-Explain the disadvantages of hot wire ammeter and how to overcome the defects. | | Capacitors in AC circuits and DC circuits 2 | Capacitors in AC circuits and DC circuits 2 |
| 4- compare between the phase angle in R-circuit and L-circuit 5- Identify the relation between the current and the voltage in L-circuit. | | https://lms.ekb.eg/playlists/view/845ea515-9ebf-4e8f-94f6-b2c25d6151b0/en/1 | https://lms.ekb.eg/playlists/view/1839f-cb9-e39c-436a-a7c0-5bfd16533002/?en/1 |
| 6- calculate the impedance of the alternating circuits. | | the inductive reactance for group of coils which are connected in series and parallel connection 1 | the inductive for group of coils which are connected in series and parallel connection 2 |
| 7- calculate the inductive reactance for group of coils which are connected in series and parallel connection. | | https://lms.ekb.eg/playlists/view/5b-9c2d0b-b2aa-48a1-8e91-111de11df3d7/en/1 | https://lms.ekb.eg/playlists/view/add58308-2921-410a-8696-427d0f-cd7140/en/1 |
| 8- calculate the capacitive reactance for group of capacitors which are connected in series and parallel connection. | | the inductive reactance for group of coils | the inductive for group of coils |
| 9-Identify the structure of oscillating circuit . | | https://lms.ekb.eg/playlists/view/8bd56d82-480d-4acd-b77b-b75d-8e30de09/en/1 | https://lms.ekb.eg/playlists/view/86d2bd1f-3889-44f7-8202-69b4f668b0db/en/1 |
| 10-calculate the frequency of tuning circuit and the uses of it. | | alternating current 1. | alternating current 2. |

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| **Chapter 5 :**<br><br>**Wave particle duality**<br><br>1-illusrate  the concept of black body radiation. | | https://lms.ekb.eg/playlists/view/acac9337-15b8-4f46-bd8a-aa261e-4c5da1/en/1 | https://lms.ekb.eg/playlists/view/3fa99b2d-5373-4cbf-a330-afca1e893df4/en/1 |
| 2- Explain the thermoionic effect and the photoelectric     effect. | | the compton effect.the photon's properties | the compton effect. the photon's properties |
| 3-Explain the compton effect.<br><br>4- Deduce the photon's properties. | | https://lms.ekb.eg/playlists/view/51a40a4c-cf62-4dc2-a21f-57c0fb29979b/en/1 | https://lms.ekb.eg/playlists/view/61a8a57c-2719-400d-9795-de7999790901/en/1 |
| 5- identify the relation between the wavelength of photon and its momentum. | | Radiation of black body 1 | Radiation of black body 2 |
| 6- explain the wave particle duality. | | | |
| 7-compare between the electron microscope<br>And optical nicroscope. | | | |
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| **Chapter 6 :**<br>**Atomic spectra** | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.amazonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S07-123-1219&topicid=3000463&langid=en,ar&ctmid=011 | https://lms.ekb.eg/repository/resource/55fd-2f8c-3b02-4e3f-ae2b-f86ff2707bcc/en | | |
| 1-Identify the Bohr's model. | Properties of | Emission and Absorption Spectra | | |
| 2-Identify the line spectrum of the hydrogen gas.<br>3-Explain the idea of work for the spectrometer and compare between the types of spectrum.<br>4-Recognize the concept of X-rays and its properties. | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.amazonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3000567&langid=en,ar&ctmid=011 | https://lms.ekb.eg/playlists/view/bef9dd20-7e6c-4d1b-b3df-a7677c31e9b9/en/1?options=-JXjsJHgQvWyCWi6yW6HBo-ko0hZb%252FZfuaXC53lpb-mx612kWF3LxVKjeUSF7A2RP-DXULvfQfqur1cPVTtssEaNs9p-c%252BoajXWjbTVaRpXY-bXVuUdI7oSlOAbHHZfjMxwrRo | | |
| 5- Identify the applications of X-rays. | Prism Spectrometer | X-Rays Applications | | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.amazonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=2000131&langid=en,ar&ctmid=011 | | | |
| | Hydrogen spectrum | | | |

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| **Chapter 7 :** <br><br>**Laser** <br><br>1-compare between spontaneous emission and stimulated emission ,explain the idea of work and deduce its properties. <br><br>2- Identify the components of laser and its applications. <br><br>3- Identify the components of(He-Ne) <br><br>Laser device by using the its digram. | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.amazonaws.com/contentview.html?c-name=EGY-208-MEG-MN-945-SS-123-0718&topicid=3001074&langid=en,ar&ct-mid=011 | https://lms.ekb.eg/repository/re-source/6eaeeb4d-96c1-4959-bb94-2d67848b6cfe/en | https://lms.ekb.eg/playlists/view/dda8b2bf-46f2-4d38-b915-0cd0ae-7cd832/en/9?options=JXjsJHgQvWy-CWi6yW6HBoko0hZb%252FZfuaX-C53Ipbmx612kWF3LxVKjeUSF7A2RP-DXBXRFVOciP%252BnkAXMPSvXn-IAPxnSa0ECs3BOLwUrEKbLrdA9C4Ds-g%252F%252BnG96GdGOFCt |
| | Applications 1 | Laser light | He-Ne laser |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.amazonaws.com/contentview.html?c-name=EGY-208-MEG-MN-945-SS-123-0718&topicid=3001072&langid=en,ar&ct-mid=011 | https://lms.ekb.eg/repository/re-source/243a75b7-a735-459c-8bd1-74d96b8db53b/en | |
| | Applications 2 | Sapphires and Lasers | |

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| **Chapter 8:**<br><br>**Modern Electronics**<br><br><br>1-Identify the pure semiconductor crystal and rising its conductivity.<br>2- Identify the structure of the pn junction (diode).<br>3- Identify the structure of the transistor , its types and the usage.<br>4- Identify the logic gates. | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3000596&langid=en,ar&ctmid=011 | https://lms.ekb.eg/repository/ resource/09fca791-2811-47fc-af59-3001911c0121/en | |
| | transistor | Electronic Signs | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3000394&langid=en,ar&ctmid=011 | | |
| | Not gate | | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3000013&langid=en,ar&ctmid=011 | | |
| | AND gate | | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3000776&langid=en,ar&ctmid=011 | | |
| | semiconductors | | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3001208&langid=en,ar&ctmid=011 | | |
| | pn-junction part 1 | | |
| | http://ekb-london-nlb-7c59b5b79d480d8b.elb.eu-west-2.ama-zonaws.com/contentview.html?cname=EGY-208-MEG-MN-949-S12-123-1119&topicid=3001228&langid=en,ar&ctmid=011 | | |
| | pn-junction part 2 | | |