

'I' Scheme

Sample Question Paper

Program Name : **Electrical Engineering Program Group**
Program Code : **EE/EP/EU**
Semester : **Third**
Course Title : **Electrical Materials and Wiring Practice**
Max. Marks : **70**

22328

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any Five of the following. 10 Marks

- a) Explain the need for following safety rules while working in electrical installations.
- b) Draw the labeled hysteresis loop for an electromagnetic material.
- c) Write any two properties of electrical insulating materials.
- d) State the need for thermal classification of electrical insulating materials.
- e) Explain in brief dielectric failure of cables.
- f) Write the names of any four components used in electrical wiring.
- g) Define earthing related to electrical wiring systems.

Q.2 Attempt any Three of the following. 12 Marks

- a) Write any four of the IE rules to be followed in respect of safety while working on electrical installation systems.
- b) Explain the suitability of aluminum as a conductor with respect to its electrical and mechanical properties.
- c) Explain the electrical, mechanical and thermal properties of mica that make it useful as an electrical insulating material.
- d) A residential unit has a sanctioned load connection of 3.5 kW. Determine the ratings of the main incoming cable/conductor, main switch and the ELCB.

Q.3) Attempt any Three of the following. 12 Marks

- a) Explain the use of the following tools in carrying out electrical wiring installations, i) Nose pliers, ii) Test lamps, iii) Crimping tools and iv) Cutter.
- b) State two applications along with the insulation class and its temperature for the following materials: i) Bakelite sheets and ii) PVC.
- c) Explain with neat labeled diagram the godown wiring system for lighting with one pilot room and two subsequent store rooms.
- d) Explain the uses of safety rubber hand gloves and rubber mats in electrical engineering.

Q.4) Attempt any Three of the following. 12 Marks

- a) Explain the use of the following components in electrical wiring systems and give specifications of each; i) one MCB and ii) one ELCB.
- b) Explain with justification two uses of each of the following as electrical conductors:

- i) silver and ii) lead – tin alloy.
- c) Explain with justification with reference to properties the use of CRGO silicon steel in electromagnetic machines.
- d) Explain any four of the various points to be kept in view while laying a given cable along a given route.
- e) A residential bungalow has a total connected load of 5 kW. Explain with a labeled sketch the earthing system suitable for it giving the dimensions of its components.

Q.5) Attempt any Two of the following.

12 Marks

- a) Describe in terms of their magnetic behavior the following materials:
 - i) ferromagnetic materials, ii) paramagnetic materials and iii) diamagnetic materials.
- b) Explain four reasons for failure of each gaseous and solid dielectric materials used in electrical engineering applications.
- c) Explain with a neat circuit diagram the procedure to measure the earthing resistance for an electrical installation using plate earthing. Sketch the expected resistance variation for a good earthing system.

Q.6) Attempt any Two of the following.

12 Marks

- a) Explain the criteria to be considered while installing an earthing system for an electrical installation.
 - b) Write two examples and two applications for each example of the following class of insulation materials i) Class Y, ii) Class F and iii) Class H.
 - c) Compare the casing/capping system of electrical wiring and the concealed system of electrical wiring. Suggest one of them for a 5 room bungalow given justification.
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Semester : **Third**
Course Title : **Electrical Materials and Wiring Practice**
Max. Marks : **70**

22328

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with neat sketches wherever necessary.
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- (4) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any Five of the following.

10 Marks

- a) Define safety related to electrical wiring works.
- b) Write any two properties of a good electrical insulation material.
- c) Define magnetostriction and name one material exhibiting it.
- d) Define dielectric failure of electrical insulating materials.
- e) Name one gaseous and one liquid electrical insulation material.
- f) Draw a labeled circuit diagram of a one lamp control circuit using one switch.
- g) Explain the need for earthing of electrical installations.

Q.2 Attempt any Three of the following.

12 Marks

- a) Explain the need to follow safety rules while carrying out electrical wiring installation works and write any two rules in this respect.
- b) Explain the suitability of copper as an electrical conductor with reference to its mechanical and electrical properties.
- c) Explain the electrical and thermal properties of transformer oil that make it suitable as an electrical insulating medium.
- d) Write down along with their functions the names of four accessories/components of electrical wiring installations.

Q.3) Attempt any Three of the following.

12 Marks

- a) Describe the use of the following tools in carrying out electrical wiring installations,
i) Pliers, ii) Screw driver sets, iii) Crimping tools and iv) Test lamp made for 400 V.
- b) Describe with reasons the failure of porcelain insulators.
- c) Explain with neat labeled circuit diagram the staircase wiring in which a lamp is controlled from two different locations.
- d) Explain the use of the following safety accessories:
i) rubber hand gloves ii) rubber mats and iii) rubber foot wear.

Q.4) Attempt any Three of the following.

12 Marks

- a) Explain the use of the following wiring components and write typical specifications of each; i) one MCB and ii) one RCB.
- b) Explain with justification two uses of each of the following as electrical conductors:
i) brass and ii) lead – tin alloy.

- c) Draw labeled sketches of the hysteresis loops for hard steel and any alloyed steel.
- d) Describe with sketches the laying of underground cables by the drawing in method.
- e) Explain with labeled sketch the working of the earthing system provided using a GI plate for an independent bungalow.

Q.5) Attempt any Two of the following.

12 Marks

- a) Compare the properties of copper and aluminum as good conductors of electricity on any six points.
- b) Write two examples and two applications for each example for the insulating materials in the following classes:
 - i) class Y, ii) class B and iii) class F.
- c) Describe using neat circuit diagrams the measurement of earth resistance for a factory installation. Explain with graphical sketch the variation of the earth resistance with respect to the distance from the earth electrode.

Q.6) Attempt any Two of the following.

12 Marks

- a) Explain the criteria to be kept in view while deciding the earthing system for an electrical installation.
 - b) Write two examples and two applications for each example of the following class of insulation materials i) Class A, ii) Class E and iii) Class H.
 - c) Describe with sketches the procedure of carrying out the work of cable jointing for a single core multi strand cable.
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Sample Test Paper

Program Name : **Electrical Engineering Program Group**
Program Code : **EE/EP/EU**
Semester : **Third**
Course Title : **Electrical Materials and Wiring Practice**
Max. Marks : **20**

22328

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) Sub-questions in a main question carry equal marks.
- (5) Assume suitable data if necessary.
- (6) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a. Define safety related to electrical wiring works.
- b. Explain two properties of copper as a conductor in electrical engineering.
- c. Write four properties of a good electrical insulating material.
- d. Explain the use of the ELCB.
- e. Draw a labelled sketch of the hysteresis loop for an electromagnetic material.
- f. Name any two insulating materials used in electrical engineering.

Q.2 Attempt any THREE.

12 Marks

- a. Explain with circuit diagram the making of the test lamp circuit suitable for 400 V lines using 230 V incandescent lamps.
 - b. Explain the reasons for preferring aluminium as conductor in electrical circuits.
 - c. Write down any two classes of insulation along with the temperature and three examples for each class.
 - d. State the application/use of the following accessories in electrical engineering works: tester, rubber hand gloves, ceiling roses and crimping tool.
 - e. Explain significance of the mechanical and thermal properties of insulating materials.
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