JANUARY 2026

509/2(N)

BUILDING ELECTRIFICATION

Time Allowed: 2.5 Hours *l Marks: 60*

Answer to Question No. 1 of Group A must be written in the main answer script. In Question No. 1, out of 2 marks for each MCQ, 1 mark is allotted for right answer and 1 mark is allotted for correct explanation of the answer.
Answer any Five (05) Questions from Group-B.

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GROUP-A

1. Choose the correct answer from the given alternatives and explain your answer (any ten): 2x10=20

(i) According to CEA regulation 42 (2023), when should an insulation resistance test be performed on an electric supply line (up to 650 volts) ? ElectricalNoteBook.com
(a) Only during initial installation. (b) after the line has been disconnected for addition, alteration, or repair. (c) every month regardless of condition. (d) only if earthing is suspected to be faulty.

(ii) In domestic premises, the residual current device (RCD) must be set at a maximum residual current of:
(a) 15mA (b) 30 mA (c) 100 mA (d) 300 mA

(iii) Which type of wire slow down the spread of fire?
(a) PVC wire (b) LC wire (c) CTS wire (d) FR wire

(iv) A stranded conductor (ACSR) is represented as 25/7/0.05 indicates the number of steel strands and diameter of each strand respectively
(a) 25, 0.05 mm (b) 7, 25 mm (c) 7, 0.05mm (d) 25, 7 mm

(v) What is the unit of luminous efficiency?
(a) Lux (b) Lumen/Watt (c) Lux/Watt (d) Candle power(CP)

(vi) To produce the illumination of 15 lux, a 60 CP lamp is to be placed at a distance of:
(a) 4 meters (b) 3 meters (c) 2 meters (d) 9meters

(vii) Which type of wiring is done in workshop? ElectricalNoteBook.com
(a) Conduit pipe wiring (b) Cleat wiring (c) Batten wiring (d) Casing and capping wiring

(viii) What is the primary function of a master control switch?
(a) To control individual components within a system (b) To enable or disable the entire system or a specific part (c) To regulate voltage and current (d) To monitor system performance

(ix) What is the maximum no of point, typically socket outlet can be given to a power sub-circuit?
(a) 1 (b) 3 (c) 4 (d) 2

(x) Maximum permissible resistance of large power station is
(a) 0.5 Ω (b) 1 Ω (c) 2 Ω (d) 5 Ω

(xi) In a 3.5 core cable 0.5 core is used for

(a) R-phase (b) Y-phase (c) B-phase (d) Neutral

(xii) What will be the total flux emitted by a source of 60 candle power?
(a) 60 lumen (b) 754.2 lumen (c) 1508.4 lumen (d) 25.4 lumen

(xiii) The cross-section of a residential main service cable is chosen based on:
(a) cable colour (b) Type of insulation (c) Load current and voltage drop (d) None of these

(xiv) The Indian standard code for Electrical Installation and Wiring is:
(a) IS 3043 (b) IS 694 (c) IS 1554 (d) IS 732 ElectricalNoteBook.com

(xv) Which type of joint is used to connect two underground cables end-to-end ?
(a) Tee-joint (b) Pot End joint (c) Straight-through Joint (d) Transition joint

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GROUP-B

Answer any Five (05) questions.

2.(a) Draw the BIS symbolic diagram of Main Switch (ICDP) and Distribution Box.
(b) Explain Briefly on CEA regulation 16: switchgear on consumer's premises and CEA regulation42: Test of insulation resistance. 2+(3+3)

3. (a) Name different type of switches.
(b)What is the advantage of stranded conductor than solid conductor?
(c)Classify the cables according to voltage level. Where are the oil filled cable used? 2+2+ (3+1)

4. (a)What are the differences between direct lighting and indirect lighting.
(b) Estimate the number, rating and disposition of lamps which would be required to illuminate a workshop space 60 X 15 metres by means of lamps mounted 5 metres above the working plane. The average illumination required is about 100lux, coefficient of utilisation is 0.4, luminous efficiency 16 lumens per watt. Assume a space-height ratio of unity and a candle power depreciation of 20%. (3 +5)

5. (a)Explain Briefly the different type of wiring methods?
(b)Draw the bedroom lighting circuit and go-down wiring circuit.
(c)On which factor does the insulation class depend? 3+ (2+2) +1

6.(a) Prepare the list of material required to supply a single storey building of 4 KW load at 240 V. Supply is to be given through an overhead line of 12 meter away from the building.
(b)What is the difference between lighting and power circuit? ElectricalNoteBook.com 6+2

7.(a) How the selection of protective switchgear for a residential building with a maximum load of 5 KW is done?
(b) One hall of polytechnic 20 m X 10 m X 3 m is to be provided with conduit system of wiring for the following provisions; Power points: 2 numbers, 1000 Watts each, Light points: 15 numbers, 40 Watts each, Fan points: 10 numbers,80 Watts each and Plug points: 10 numbers, 100 Watts each. Supply is 1-phase, 240 V, 50 Hz ac. Draw the circuit Layout up to the distribution board. Determine the numbers of the circuits for power and fan and light circuits. Calculate the sizes of the wiring required. (2+6)

8. (a) Why earth resistance is kept low?
(b)Draw and explain plate earthing.

(c)What is the maximum leakage current for a house of having 4 numbers 80 W fan, 20 numbers 40 W lamp? 2+4+2

9.a) What is the purpose of earthing in a wiring system? What is the difference between equipment earthing and system earthing?

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b) Describe working principle of ELCB with connection diagram and state its application. (2+2) +4

10. Write short notes on the following (Any two) 4+4

(a) Wire jointing methods.

(b) Cable laying methods.

(c) Modern methodsof Earthing.

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