

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: B.ARCH.  
BRANCH: ARCHITECTURE**

**SEMESTER : V  
SESSION : MO/18**

**SUBJECT: AR5301-BUILDING SERVICES - III (ELECTRICAL & LIGHTING)**

**TIME: 03:00**

**FULL MARKS: 60**

**INSTRUCTIONS:**

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
  2. Candidates may attempt any 5 questions maximum of 60 marks.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Explain briefly the concept of three phase electricity generation. [2]  
(b) Discuss the Role of Transformer in Electrical distribution System. [4]  
(c) How electricity is distributed from grid generation to an individual house? Explain using a flow chart. [6]
- Q.2(a) Explain briefly the general principles of openings to afford good lighting. [2]  
(b) Discuss briefly the four different types of domestic wiring system. [4]  
(c) Write short notes on : [6]  
i) High Pressure Sodium Lamps  
ii) Halogen Lamp
- Q.3(a) What is the Inverse Square Law? Explain. [2]  
(b) Discuss about the advantages of wire color coding system. [4]  
(c) What is the importance of single line diagram in electrical wiring system also mention its advantages? [6]
- Q.4(a) Discuss some important safety rules while work on electrical line. [2]  
(b) Define 'Earthing'. Why it is needed in the buildings? [4]  
(c) Explain "Pipe Earthing" with proper sketch and labeled its different parts. [6]
- Q.5(a) What is Glare? [2]  
(b) How glare can be avoided in lighting design? [4]  
(c) Explain briefly the criteria for location and requirement of Electrical Duct. [6]
- Q.6(a) What are the advantages of overhead power lines? [2]  
(b) Explain briefly the general principles of lighting. [4]  
(c) Define the following: [6]  
i) Daylight Factor  
ii) Luminous Flux
- Q.7(a) Differentiate between the following: [2]  
(i) LED & CFL Lamp.  
(b) What is lightning protection system? Explain it with suitable example? [4]  
(c) A room of dimensions 12.0m x 10.0m x 3.0m has a required design illumination of 500 Lux on the working plane (0.85 metres above the floor). The Utilisation factor is 0.5 and the Maintenance factor is 0.8. If the LDL output of each fitting is 2720 lumens, workout the following: [6]  
(a) The number of fittings required.  
(b) The fittings layout.  
(c) If the spacing: mounting height ratio is 1: 1 determine whether the current design is acceptable.