

B.Architecture Examination 2018(Old)**[4thYear 2ndSemester]****Subject: Service and Equipment-III**

Time: 3 hours

Use Separate Answer script for each part

Full Marks:100

(50 Marks for each part)

Part-I

ANSWER Q. No. 1 AND ANY TWO QUESTIONS

Q.1.

A) Explain the following terms related to the vision science-

i) trichromatic vision; ii) photopic vision; iii) mesopic vision and iv) scotopic vision.

B) Illustrate, with example, the additive colour theory. Why object colour theory is also known as subtractive colour theory?

C) Explain the physical processes of light generation – incandescence and electro-luminescence with at least two examples for each.

D) What do you understand by energy efficient lighting system?

8+6+6=20

Q.2.

A) A light source having luminous intensity $I_v = 350 * (\cos \gamma)^{1.5}$ cd is suspended over a floor at a height of 3m. Calculate both the vertical and horizontal illuminance at a grid point 2m directly below the source. What would be the above values if the grid point is shifted 1m from the first one on the same horizontal surface?

B) Define the followings with SI unit -

i) Luminous intensity; ii) Illuminance; iii) Luminance.

8+7=15

Q.3.

A) Prepare a table listing the electrical and photometric parameters of an electric lamp.

B) Draw typical spectral power distribution curves of a white light emitting diode and a tungsten filament lamp and hence infer on their colour appearance (CCT) and performance to render object colour (CRI) from the respective curves.

C) Write down applications of warm white and cool white lamps for indoor environments of different surface colour and furniture.

4+6+5=15

Q.4.

A) Discuss on the following indoor lighting design parameters-

i) maintained average illuminance on working plane; ii) uniformity of illuminance; iii) unified glare rating; iv) lighting power density and v) modelling index.

B) Discuss on advantages and limitations of daylight integration in indoor lighting.

10+5=15

Q5.

A) Write down the Lumen formula to estimate the quantity of luminaires of an indoor general lighting scheme.

B) Propose a general lighting scheme for an office room (8m x 6m x 4m) with luminaire layout using the given data and estimate LPD -

Luminaire - 26W WLED downlight; Dimension 0.25m x 0.25m; 2470 Lumen;

Surface reflectances - 80%; 70%; 20%;

Horizontal working plane at height of 0.9m above floor;

Maintained $E_{avg} \geq 500$ Lux; Coefficient of utilization = 0.60; Maintenance factor=0.80.

5+10=15

NAME OF THE EXAMINATION: B.ARCHITECTURE FOURTH YR. SECOND SEMESTER (OLD)-2018

SUBJECT: SERVICE AND EQUIPMENT-III

TIME: THREE HOURS

FULL MARKS: 100 (50 MARKS FOR EACH PART)

PART-II

Answer Question 1 any two from the rest.

1. Write short note on any six: 3x6=18
- i) Load Factor
 - ii) Riser in high rise building
 - iii) Distribution Transformer
 - iv) Cable laying in ground
 - v) MCB and ELCB
 - vi) System Earthing
 - vii) Difference between isolator and circuit breaker
 - viii) Loop-in wiring in Residential Building
 - ix) Minimum bending radius of cables
- 2 (a) Describe how damages are caused by Lightning. 8
- (b) How necessity of protection against lightning is assessed. 8
- 3 (a) Describe plate earthing procedure with diagram. 8
- (b) What are casing and capping and batten types of house wiring? Explain their merits & demerits. 8
- 4 (a) What are the different electric supply systems for different estimated load demands for a housing estate? 9
- (b) Each of the twelve apartments in a building has connected load as follows
- i) 12 Lamps, 18 Watts each, ii) 6 Fans, 70 Watts each, iii) 8 Plug Points for 100 Watts each, and
 - iv) three Coolers, 1000 Watt each.
- Common load is 1560 Watts. Diversity Factor for the apartments is 1.3.
- What is the estimated load demand for the building? 7