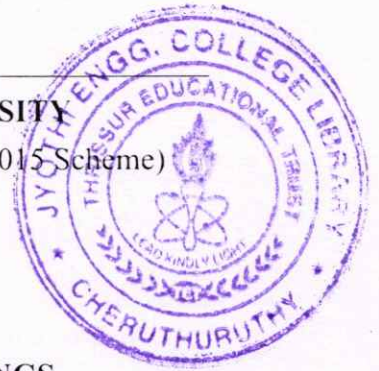


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S, FE) Examination June 2024 (2015 Scheme)

**Course Code: CE365****Course Name: FUNCTIONAL DESIGN OF BUILDINGS**

Max. Marks: 100

Duration: 3 Hours

PART A*Answer any two full questions, each carries 15 marks.*

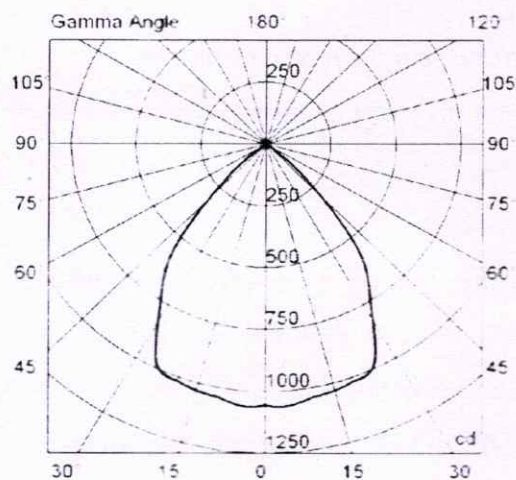
Marks

- | | | | |
|---|----|---|------|
| 1 | a) | Distinguish between dB and dBA in sound intensity measurements | (5) |
| | b) | Intensity of a rock music programme is 8.93×10^{-2} watts/m ² . Find the corresponding intensity in dB scale. | (5) |
| | c) | What are the various noise control measures that can be adopted in a building | (5) |
| 2 | a) | Find the reverberation time for a hall of 12m x 9m x 6m having average absorption coefficient of 0.15. Also determine how much area needs to be treated with a material having absorption coefficient 0.20 to reduce the reverberation time to 1.2sec | (8) |
| | b) | 1m x 2.1m door is provided for a school class room having size 6m x 3. The transmission loss for door and wall is respectively 10dB and 50dB respectively. Determine the composite Transmission Loss due to provision of this door on the wall. | (7) |
| 3 | a) | List and explain any six acoustical defects seen in an auditorium | (3) |
| | b) | Consider two sound sources (S1 & S2) working inside a room having sound power level of 40dB each. Point A is located inside the room, 2m and 2m away from both the sources. Calculate the | (12) |
| | a. | Sound power for S1 & S2, | |
| | b. | Total intensity at Point A and | |
| | c. | Sound power level (in dB) at Point A | |

PART B*Answer any two full questions, each carries 15 marks.*

- | | | | |
|---|----|---|-----|
| 4 | a) | Define the components of Day light factor. What would be the indoor illuminance of a room if the DF is 1.2% | (5) |
|---|----|---|-----|

- b) Discuss the features, types and suitability of Lux Grids used for design of windows (10)
- 5 a) What are the main types of luminaires, elaborate their flux distribution characteristics (5)
- b) A point source luminaire has an output as shown on the polar curve (Cd/1000 lm). It is mounted 2.5m above the work plane and is fitted with an 18watt CFL, whose output is 1500 lumens. Calculate the illuminance at a point located at 2.5m to left side from the exact bottom point of lamp. (10)



- 6 a) What is Polar Curve? Explain with an example. (3)
- b) Elaborate the methodology of Lumen Method used in Artificial lighting design (12)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the term. Thermal Comfort (5)
- b) A 5 x 5m and 2.5m high office is located on an intermediate floor of a large building, therefore it has only one exposed wall facing south. All other walls adjoin rooms kept at the same temperature of 26 °C. The ventilation rate is three air changes per hour. There are three 100W bulbs are in continuous use to light the rear part of the room, which is used by four clerical workers. The exposed 5x2.5m wall consists of a single glazed window 1.5x5m = 7.5 m²; U=4.48 w/m² deg C and a clinker concrete wall, 200mm rendered and plastered 1x5m = 5m²; U=1.35 w/m² deg C. Incident radiation (I) = 580 w/m² s, absorptance of the wall surface (a) = 0.4, surface conductance = f₀ = 10 w/m² deg C. Solar gain factor (Θ) = 0.75. Determine the heat gain. (15)

- 8 a) Explain the factors affecting Thermal Comfort (10)
b) What is time lag and decrement factor? (5)
c) What is Sol-Air concept? How to determine Sol Air temperature (5)
- 9 a) What is CET? Draw explain CET Chart (14)
b) Explain the following: (6)
(i) Declination angle,
(ii) Altitude angle.
(iii) Azimuth Angle
