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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

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) With the help of a neat sketch, explain the characteristics of sound wave. Explain pure tone. (5)

b) Explain the inverse square law of sound. Examine velocity of sound in different media. (5)

c) Explain sound intensity and its different units. How do you relate the different units? (5)

2 a) Discuss the audibility range of humans with a neat labelled sketch. (4)

b) Using graphs, explain the free field and reverberant field behaviour of sound. Also, explain the unit of 1 Sabine. (6)

c) Explain reverberation time and its measurement. (5)

3 a) Explain the any four considerations for the acoustic design of an auditorium. (4)

b) Discuss Transmission loss. Describe the steps to find the TL value of a solid wall when a circular hole is drilled through it. (6)

c) Explain the effects of noise on humans and ways to control it. (5)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Discuss purpose of lighting. . (4)

b) Distinguish between daylighting and artificial lighting. (4)

c) Explain day-light factor and its components. (7)

5 a) Explain the design parameters of daylighting design. Describe the steps involved in designing the number of fenestration in a building for a given daylight factor percent. . (11)

b) Explain colour temperature and colour rendering index. . (4)

6	a)	Explain effects of glare in lighting.	(3)
	b)	Illustrate lumen method of artificial lighting design for your classroom. Assume dimensions of the classroom as 12m x 9m x 3m, working plane height to be 0.9m and luminaire mounting height to be 2.4m, required illumination for a classroom as 300 lux and the luminaire to be consisting of two fluorescent lamps of 1500 lumens each. Take MF=0.65, SHR=1.5, UF=0.43. .	(7)
	c)	Discuss different forms of outside lighting.	(5)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Discuss thermal comfort indices.	(4)
	b)	Discuss effective temperature and its significance. .	(6)
	c)	Describe the use of psycrometric chart. .	(5)
	d)	Compare and contrast between ET-CET Charts.	(5)
8	a)	Explain with a neat sketch the solar path diagram.	(4)
	b)	Discuss the important dates in a year due to apparent motion of the sun with respect to the earth.	(5)
	c)	Explain different heat flow processes in a building. Define the thermal quantities – thermal capacity and transmittance of a body.	(6)
	d)	Define solar angles Altitude and Azimuth. Explain solar gain factor.	(5)
9	a)	Describe the steps in heat gain/loss calculation of a building.	(7)
	b)	Explain the concept of periodic flow with a labelled neat sketch giving definitions of time lag and decrement factor.	(4)
	c)	Discuss the various climatic zones in India. Describe the design approaches for any one of these zones in detail.	(4)
	d)	Discuss significance of making buildings 'green'.	(5)

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