T5938

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| **Scheme of Valuation/Answer Key For QP**  (Scheme of evaluation (marks in brackets) and answers of problems/key) | | | | | | | |
| **APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  V SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018 | | | | | | | |
| **Course Code: CE365** | | | | | | | |
| |  |  |  | | --- | --- | --- | | |  |  | | --- | --- | | |  | | --- | | **Course Name: FUNCTIONAL DESIGN OF BUILDINGS** | | | | | | | | | | |
| Max. Marks: 100 | | |  | Duration: 3 Hours | | | |
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| **PART A** | | | | | | | |
|  |  | ***Answer any two full questions, each carries 15 marks.*** | | | | Marks | |
| 1 | a) | I W/m2 = 10 log I/I0 dB. I0 is the reference intensity = 10-12 W/m2  dB is a measure of the intensity of sound. But loudness depends both on Intensity and frequency (one example may be given). dBA is a measure of the loudness of sound which gives weight-age to frequency also. It is also called A-weighted measurement | | | | (2)  (3) | |
|  | b) | Fig  Threshold of audibility and threshold of Pain  Low and High frequency of audibility | | | | (2)  (2)  (1) | |
|  | c) | 45= 10 log 1/t1, therefore t1=3.16 X 10-5  A2= 3.14\*0.05\*0.05/4 = 1.96\*10-3  A1= 16-1.96\*10-3 =15.998  t2=1  t= [15.998\*3.16\*10-5 + 1.96\*10-3\*1]/16 = 1.54\*10-4  TL= 10 log 1/(1.54\*10-4) = 38 dB  Reduction in TL =45-38 = 7 dB | | | | (1)  (2)  (1)  (1) | |
| 2 | a) | Time taken by the sound to get reduced to one millionth of its original value OR time taken to get reduced by 60 dB.  Sabine’s formula  High reverberation time will make the room unintelligible and very low reverberation will make the room lifeless. | | | | (2)  (1)  (1) | |
|  | b) | Discussing any 5 defects (1\*5) | | | | (5) | |
|  | c) | V= 540 m3  Absorption of open windows and doors=14 m2 Sabine  Absorption by walls=7.12 m2 Sabine  Absorption by ceiling= 5.4 m2 Sabine  Absorption by 80 people and 40 vacant seats = 40.80 m2 Sabine  T= 0.16\*V/A = 0.16\*540/70.02=1.23 sec  Slightly high for speeches, ideal for music | | | | (½)  (1)  (½)  (½)  (1)  (1)  (½) | |
| 3 | a) | Definition  Impact on human  Source, Path, Receiving end  Explaining details | | | (1)  (2)  (1)  (3) | |
|  | b) | The problems in factory is connected with noise  Explaining the noise reduction techniques to be followed in factories | | | | (4) | |
|  | c) | Factory made acoustical tiles and boards, In situ acoustical plasters, acoustic blankets, combinations- explaining each | | | | (4) | |
| **PART B** | | | | | | | |
| ***Answer any two full questions, each carries 15 marks.*** | | | | | | | |
| 4 | a) | Three primary purposes | | | | (3) | |
|  | b) | Correct definition. Terms like simultaneous measurement, illumination on a horizontal plane from unobstructed hemispherical sky, excluding direct sunlight etc. should come in definitions | | | | (6) | |
|  | c) | l/d, h/d values and explaining about computation of sky components from table.  Explaining the method of computation when the point under consideration is not exactly behind the window. | | | | (4)  (2) | |
| 5 | a) | Explaining two advantages and disadvantages each | | | | (4) | |
|  | b) | Fig  Explanation on Intensity, flux and illumination  Units: Candela, Lumen, Lux | | | | (1½)  3  (1½) | |
|  | c) | Explaining colour temperature; warm light, neutral light, cool light  Explaining colour rendering,Colour rendering Index etc. | | | | (2)  (3) | |
| 6 | a) | Definition (2) and explanation a with neat sketch (3) | | | | (5) | |
|  | b) | E = N (n\*ɸ) MF\*UF/ A  300= N(2\*1500)\*0.75\*0.60/(24\*/10) and N=54  SHR = 1.5, hence maximum possible spacing = (2.8-0.8)\*1.5 = 3 m  A sketch showing the room 24 X 10 and lighting arrangements 11X5 or similar | | | | (1)  (2)  (1)  (2) | |
|  | c) | A brief note indicating lamp types, avoiding light trespassing and light pollution | | | | (4) | |
| **PART C** | | | | | | | |
| ***Answer any two full questions, each carries20 marks.*** | | | | | | | |
| 7 | a) | Explaining 4 factors temperature, humidity, air speed, radiation clearly  Explaining the concept of indices | | | | (4)  (2) | |
|  | b) | Explaining the use of ET/CET chart with a rough but neat sketch, marking the comfort zone etc. | | | | (6) | |
|  | c) | March 21, September 23: Days of equal day and night everywhere in the earth.  June 21st Max daytime in Northern hemisphere and min in Southern  December 22nd Minimum day time in Northern and Maximum in Southern | | | | (2)  (1)  (1) | |
|  | d) | Solar constant  Azimuth with fig  Altitude with fig | | | | (1)  (1½)  (1½) | |
| 8 | a) | Rough but neat sketch of a typical solar path diagram for any latitude between 9 and 13 degree North.  Explaining its use in finding Azimuth, Altitude and in the design of shading devices etc | | | | (3)  (2) | |
|  | b) | Combined effect of air-temperature and solar radiation  Ts =To + I\*α/fo explaining different parameters  Numerical example like say To= 30 degrees, I = 600 W/sq.m, α = 0.20 and fo= 16 W/ m20c  Ts = 30+600\*0.20/16 = 37.5 0C (any example with sensible values will do) | | | | (1)  (2)  (2) | |
|  | c) | Explaining any 5 aspects in detail (5\*2) | | | | (10) | |
| 9 | a) | At least 4 genuine conditions for both Hot & dry and Warm & Humid regions | | | | (8) | |
|  | b) | Brief description about thermal insulating materials  Explaining at least 4 methods of thermal insulation | | | | (3)  (4) | |
|  | c) | Explaining in detail the basic concepts of green building | | | | (5) | |
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