VAN LANG UNIVERSITY

**FACULTY: ARCHITECTURE**

**ANSWER KEYS FOR THE END-OF-COURSE EXAMINATION (2nd time)**

**Semester 2 , Year 2022 - 2023**

Course code: 222\_7AR0220\_01

Course name: Architectural physics 1

Group code: K26DB-A01 K26DB-AR

Duration (minute/day): 60 minutes

Format: Essay

**Format nội dung đáp án đề thi:**

- Font: Times New Roman

- Size: 13

**A 1 (4 điểm): State the reasons for Condensation of water vapor on the surface of the structure, and propose solutions to treat this phenomenon**

When the internal surface temperature τt is smaller than ts, water vapor condenses on the inside of the structure. In the corners of houses that lack ventilation and has low τt, or on the wall parts with good thermal conductivity, dew stagnation occurs first. Some solutions for selecting materials and covering structures to raise the value of τt are:

If the air in the room is normal, increase the **R** of the structure, while reducing **Rt** to increase **τt**. Reduce **Rt** by increasing the wind speed across the room to increase **αd**.

* Interior arrangement does not interfere with the speed of air circulation.
* If the humidity in the room is large (WC room, water floor,...) and the air temperature in the room is low, it is difficult to avoid condensation of water vapor on the structural surface, then it is necessary to use a layer of waterproof material on the structural surface to prevent vapor condensation from being absorbed into the interior of the structure.

Note: it is not recommended to create 2 layers of waterproofing on 2 sides of the structure since it will lock moisture inside the structure, making the structure quickly decay.

* In works that are not used regularly, condensation may appear infrequently (cinemas, theaters, ...). Therefore, porous cement with appropriate thickness should be used for the inner surface so that it is able to absorb the condensed vapor, preventing the phenomenon of water condensing into drops on the inner surface. Then, use ventilation to release this condensation.

A 2 (6 điểm): Excess heat emitted by 1000 workers:

* Qthừa = 1000 (125 – 90) = 35 000 kcal/h

 The amount of air required to process this excess heat:

* G = G1 = G2 = $\frac{35 000}{0,24 (35-25)}$ = 14 583,33 kg/h
* $γ\_{tr}$ = ½ (1,155 + 1,133) = 1,144 kg/m3
* Δ$γ$= 1,177 – 1,144 = 0,033
* ΔP = 12. 0,033 = 0,396
* ΔP1 = 1/3. 0,396 = 0,132 m/s
* ΔP2 = 0,396 – 0,132 = 0,264
* v1 = $\sqrt{\frac{2 x 9,81 x 0,132}{1,177}}$ = 1,48 m/s
* v2 = $\sqrt{\frac{2 x 9,81 x 0,264}{1,122}}$ = 2,1 m/s
* F1 = $\frac{14 583}{0,5 .1,48 . 3600 .1,177}$ = 4,6m2
* F2 = $\frac{14 583}{0,5 . 2,1 . 3600 .1,133}$ = 3,4m2

 Choose F1 = 5m2 và F2 = 4m2.

 With the existing door area and the above conditions, it is possible to handle the heat emitted by 1000 workers.

*Ngày biên soạn: 8/03/2023*

**Giảng viên biên soạn đáp án đề thi:** Th.S KTS Nguyễn Thị Việt Hà

*Ngày kiểm duyệt:*

**Trưởng (Phó) Khoa/Bộ môn kiểm duyệt đề thi:** Th.S KTS Nguyễn Bảo Tuấn

Sau khi kiểm duyệt đề thi, **Trưởng (Phó) Khoa/Bộ môn** gửi về Trung tâm Khảo thí qua email:khaothivanlang@gmail.combao gồmfile word và file pdf (được đặt password trên 1 file nén/lần gửi) và nhắn tin password + họ tên GV gửi qua Số điện thoại Thầy Phan Nhất Linh (**0918.01.03.09**).