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**Reg. No. :**

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**Question Paper Code: U2P06**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Second Semester

Civil Engineering

21UPH206- BUILDING PHYSICS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- Which of the following is not a method of heat transfer? CO2-U  
(a) Radiation                      (b) Conduction                      (c) Convection                      (d) Insulation
- In which of the following are the particles closest together? CO2-U  
(a) solid                      (b) liquid                      (c) gas                      (d) fluid
- An organ pipe closed at one end has a fundamental frequency of 1500Hz. CO1-App  
The maximum number of overtones generated by this pipe, which a normal person can hear is?  
(a) 12                      (b) 9                      (c) 6                      (d) 4
- If fundamental frequency is 50 and the next successive frequencies are 150 CO2- U  
and 250, then it is \_\_\_\_\_  
(a) A pipe closed at both ends                      (b) A pipe closed at one end  
(c) An open pipe                      (d) A stretched string
- Which of the following is a metallic glass? CO2- U  
(a) Argon                      (b) Crypton                      (c) Nickel                      (d) Gold
- Phases of shape memory alloys CO2- U  
(a) Martensite                      (b) Austenite                      (c) both a and b                      (d) only a
- Porcelain is a type of \_\_\_\_\_ ceramic. CO6-U  
(a) white ware                      (b) stone                      (c) abrasive                      (d) cement

8. Which of the following is not a step in making ceramics? CO6-U  
 (a) Powder pressing (b) Sintering (c) Alloying (d) Vitrification
9. A Carbon monoxide sensor made of zirconia uses which CO2-U  
 characteristic to detect any change?  
 (a) Capacitance (b) Resistivity (c) Activity (d) Permeability
10. On both ends of the CNTs, which carbon nanostructure is placed? CO2-U  
 (a) Graphite (b) Diamond (c) C<sub>60</sub> (d) Benzene

PART – B (5 x 2= 10Marks)

11. Give a short note on Heat Exchange processes between a building and the CO2-U  
 external environment
12. Mention the Classification of sound waves based on the frequency CO2-U
13. Give a short note on pseudo elasticity CO2-U
14. Mention the chemical properties of ceramics CO2-U
15. Mention the applications of nano phase materials. CO2-U

PART – C (5 x 16= 80Marks)

16. (a) Outline some methods of thermal insulation of buildings CO2-U (16)  
 Or  
 (b) A slab of material length 1m, area of cross section is 5m<sup>2</sup>. One end CO1-App (16)  
 of the slab is at 100<sup>0</sup>c and other end at 50<sup>0</sup>c. Calculate the thermal  
 conductivity of the slab.
17. (a) A hall has a volume of 5000 m<sup>3</sup>. It is required to have CO5-App (16)  
 reverberation time of 1.5 second. What should be the total  
 absorption in the hall ?  
 Or  
 (b) A hall has a volume of 2265 m<sup>3</sup>. Its total absorption is equivalent CO5-App (16)  
 to 92.9 m<sup>2</sup> of open window. What will be the effect on  
 reverberation time if audience fills the hall and there by increases  
 the absorption by another 92.9 m<sup>2</sup>.
18. (a) Explain the preparation, types and properties of metallic glasses CO2-U (16)  
 Or  
 (b) Explain the properties of shape memory alloys CO2-U (16)

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|-----|-----|--|-------|------|
| 19. | (a) | Describe the classification of ceramics        | CO2-U | (16) |
|     |     | Or   |       |      |
|     | (b) | Explain fiber reinforced plastics              | CO2-U | (16) |
| 20. | (a) | Explain scanning electron microscope           | CO2-U | (16) |
|     |     | Or   |       |      |
|     | (b) | Explain the properties of Nano phase particles | CO2-U | (16) |

