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MSE-007

POST GRADUATE DIPLOMA IN FIRE SAFETY AND DISASTER MANAGEMENT (PGDFSTYDM)

Term-End Examination 00008

December, 2013

MSE-007 : FIRE ENGINEERING SCIENCE

Time : 3 hours *Maximum Marks : **100***

Note : *Question No.1 is compulsory. Attempt **any four** questions from remaining. Log table non-programmable calculator can be **used**.*

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1. (a) Tick the correct answer. **2x10=20**

(i) Limit heat calories defined as the amount of heat required to raise the temperature of :

(A) One grame of a body through one degree centigrade.

(B) One grame of a body through certain range.

(C) One grame of water through one degree of centigrade.

(D) One grame of Silver through 1°C.

(ii) Which of the following producess more sever burns ?

(A) Boiling water

(B) Air at 100°C

(C) Sun Ray.

(D) None of these.

(iii) The temperature of a block iron in 140°F, its temperature on celsius Scale is :

(A) 180°C
(B) 32°C
(C) 60°C
(D) 140°C

(iv) Heat flows from hotter body to colder body :

(A) Conduction
(B) Convection
(C) Radiation
(D) All these three

(v) Melting point of steel :

(A) 100°C
(B) 1000°C
(C) 1400°C
(D) 3000°C

(vi) In which state of material the substance have very low density ?

(A) Solid
(B) Gas
(C) Vapour
(D) Liquid

(vii) What term will satisfy to the minimum temperature at which sufficient vapors are given by a flammable materials to ignite without application external flame ?

(A) Spantaneous Ignition Temp
(B) Ignition Temp
(C) Fire Point
(D) Auto Ignition Temp

(viii) 4.18 Joules is equal to how much calories of wats ?

(A) 10 calories

(B) one calory

(C) 21 calories

(D) None of these

(ix) Which of the following statement is not carrect :

(A) Energy is the capacity to do work

(B) Work can be express as force × distance

(C) Power is the amount of work done in a unit of time

(D) The unit of Power is the Joule

(x) A 15 mm dia nozzle flows wats at the rate of 500 LPm. What is the velocity of the flow.

(A) 50.21 m/sec

(B) 47.11 m/sec

(C) 49.31 m/sec

(D) 4.11 m/sec

(b) Fill in the Blanks. **2x10=20**

(i) A Temperature of 5°c is equal to _____° F.

(ii) Critical Temprature of CO_2 is _____°C.

(iii) In an ideal gas variation in its volume is _____ properational to its pressure if temp remain constant.

(iv) The density of a substances is lower than the density of water and does not mix with water than the substance will_____an water.

(v) The quantity of heat is required to completely convert 1 kg of liquid to its vapour without change in temp. known as _____ of vapor.

(vi) _____ is an example of Solar Radiation.

(vii) At Normal Temp. and Pressure a cubic meter of Air has a mass of around _____ kg.

(viii) When the Combustion in active and burns with flame is called_____.

(ix) Any substance that has mass and occupy space is known_____ .

(x) Among all pumps_____ pump is most efficient.

2. What is traingle of Fire? Give the details of transmission of Fire and their Fire Extinguishing principles. **15**

3. Give short notes on **any three** of the following **3x5=15**

(a) Latent Heat of fusion and Latent of vaporization.

(b) Linuts of Flammability

(c) Flash Point

(d) Principle Extinguishing Mechanism of Fire.

(e) Effect of heat on materials.

(f) Physical Properties of CO_2

4. (a) What is the role of chain reaction in a fire and how it works ? **8**

(b) A Nozzle is flowing at a rate of 300 *lb*/ minute. If Velocity of flow 28.27 m/sec. Calculate the diameter of the hose. **7**

5. (a) Water is flowing at a velocity of 26 m/sec through 18mm diameter nozzle. Calculate the nozzle reaction. 7

(b) What are the different types of Combustion. Explain ? 8

6. (a) How the Omh's law used ? Give the example. 8

(b) A 20 ft. beam of iron after 1000°c termperature in fire will increase how much Length 2.coeff Linear Exp of Iron is $= 12 \times 10^{-6}$ 7

7. (a) Calculate the pressure in the pump supply water through two Lengths of 63mm dia hoses each at 30 mts connected to 15mm dia Nozzle, if the velocity of the flow at nozzle is 28 m/sec. Calculate the pressure on the pump. Friction factor = 0.007. 8

(b) Calculate the loss of Pressure due to friction in three Lengths 63 mm dia nose each 30m*l* long through water is flowing at rate of 380 Lpm. The Friction Factor is .0066. 7

8. (a) Briefly explain the Mechanism by which water acts as Fire Extinguishing media. 7

(b) What is Combustible matter ? Describe the characteristic of three physical state of matter. 8