Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14FP2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PRINCIPLES OF FOOD PROCESS ENGINEERING** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | | | **Course outcome** | **Marks** |
| **PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)** | | | | | | |
| 1. | ML-1T-1is the dimension of | | | | CO2 |  |
|  | a. Viscosity | b. Density | c. Volume | d. specific gravity |  | (1) |
| 2. | The unit for specific surface area is | | | | CO2 |  |
|  | a. m/Kg | b. Kg/m | c. m2/Kg | d. Kg m /s |  | (1) |
| 3. | In pico gram pico is | | | | CO2 |  |
|  | a. multiple | b. submultiple | c. unit | d.dimention |  | (1) |
| 4. | Intensive property is independent of | | | | CO2 |  |
|  | a. Capillarity | b. Density | c. Pressure | d. mass |  | (1) |
| 5. | Pressure is an ------------ property | | | | CO2 |  |
|  | a. Extensive | b. Intensive | c.extradinary | d. None |  | (1) |
| 6. | Specific volume is the reciprocal of | | | | CO2 |  |
|  | a. Weight density | b. viscosity | c. mass density | d.Specific heat |  | (1) |
| 7. | For gaseous mixture volume % is equal to | | | | CO2 |  |
|  | a. Mass % | b. weight % | c. Mass fraction | d. Mole % |  | (1) |
| 8. | Raoult’s law is applicable for ----------- solution | | | | CO2 |  |
|  | a. Real gas | b.Non ideal | c. Ideal | d. Ideal gas |  | (1) |
| 9. | The unit of Reynolds No is | | | | CO2 |  |
|  | a. kg m/s | b. lpm | c.m/s | d.unit less |  | (1) |
| 10. | In Bernoulli equation for steady flow -------------- is constant | | | | CO2 |  |
|  | a. Energy | b. Mass | c.Force | d. Momentum |  | (1) |
| 11. | Under steady state condition the property of the system will not change with ------- | | | | CO2 |  |
|  | a. Velocity | b.Acceleration | c.Time | d. Pressure |  | (1) |
| 12. | The example for derived quantity is | | | | CO2 |  |
|  | a. Columb | b. radian | c.Force | d. length |  | (1) |
| 13. | Equivalent weight is molecular weight divided by its | | | | CO2 |  |
|  | a. Atomic weight | b. Mole | c.density | d.Valency |  | (1) |
| 14. | The valency of H3PO4 is | | | | CO2 |  |
|  | a. 2 | b.3 | c.4 | d.0 |  | (1) |
| 15. | Moles of solute per kg of solvent is called | | | | CO2 |  |
|  | a. Molarity | b. Molality | c. Normality | d.Viscosity |  | (1) |
| 16. | Fluid with no viscosity is called | | | | CO2 |  |
|  | a.Ideal solution | b.Real solution | c.Ideal fluid | d.Ideal gas |  | (1) |
| 17. | Bernoulli equation is based on law of conservation of | | | | CO2 |  |
|  | a. Viscosity | b.Momentum | c.Energy | d. Mass |  | (1) |
| 18. | Continuity equation is based on law of conservation of | | | | CO2 |  |
|  | a.Mass | b. Momentum | c.Viscosity | d. Energy |  | (1) |
| 19. | Heat of formation of the substance in the elemental state is | | | | CO2 |  |
|  | a. 10 | b.Zero | c. One | d. Two |  | (1) |
| 20. | Liquids will have -------------- specific heats | | | | CO2 |  |
|  | a. one | b. two | c.three | d.four |  | (1) |

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| 21. | The size of the pipe line which discharge 200 liters/min of water with a velocity of 0.4 m/sec | | | | CO2 |  |
|  | a. 59 mm | b. 103 mm | c. 120 mm | d. 100 mm |  | (1) |
| 22. | Force of attraction between unlike molecules are called-------------- force | | | | CO2 |  |
|  | a. Vander waals | b. Adhesive | c. Cohesive | d.Nuclear |  | (1) |
| 23. | The head loss due to the sudden expansion is called | | | | CO2 |  |
|  | a. Major loss | b. minor loss | c. Momentum loss | d. Velocity loss |  | (1) |
| 24. | Darcy’s equation is used to predict the | | | | CO2 |  |
|  | a. Major loss | b. Momentum loss | c. Heat loss | d. Minor loss |  | (1) |
| 25. | The smallest cross section for flow in orifice meter is called ----------- | | | | CO2 |  |
|  | a. Orifice | b. Vena Contracta | c. Throat | d. Diverging cone |  | (1) |
| 26. | 10 ppm is equal to | | | | CO2 |  |
|  | a. 10 m3/g | b. 10 mg/lit | c. 10 g/lit | d. 10 g/m3 |  | (1) |
| 27. | The unit for latent heat of vapourization is | | | | CO2 |  |
|  | a. Kg/KJ | b. Kcal/Kg | c.Kcal/Kg K | d.Kg/Kcal |  | (1) |
| 28. | According to Boyle’s law volume is --------------- proportional to pressure | | | | CO2 |  |
|  | a.Independent of P | b.Inversely | c. Directly | d. Indirectly |  | (1) |
| 29. | The pressure correction factor in the case of real gases is | | | | CO2 |  |
|  | a. VT | b. an2/v2 | c.v/n | d.v2/n2 |  | (1) |
| 30. | Equilibrium vapour pressure is a function of | | | | CO2 |  |
|  | a. Density | b.Viscosity | c.Temperature | d. Volume |  | (1) |
| 31. | The specific heat capacity can be expressed as a polynomial in ----------- | | | | CO2 |  |
|  | a. Pressure | b. Temperature | c. Heat | d. Energy |  | (1) |
| 32. | The driving force for heat transfer at equilibrium is | | | | CO2 |  |
|  | a. 1 | b.Zero | c. higher | d. lower |  | (1) |
| 33. | The discharge co efficient for the orifice meter will be around | | | | CO2 |  |
|  | a. 0.5 | b.2 | c. 0.9 | d.1 |  | (1) |
| 34. | The ratio between the actual discharge to the theoretical discharge is ------------ co efficient | | | | CO2 |  |
|  | a. discharge | b.Viscosity | c. Shape factor | d.Friction |  | (1) |
| 35. | Sum of atmospheric pressure and gauge pressure is called ------------- Pressure | | | | CO2 |  |
|  | a. Atmospheric | b.Absolute | c.Relative | d. Acute |  | (1) |
| 36. | Gases will show ideal behavior at ------------ temperature | | | | CO2 |  |
|  | a. High | b. Low | c. Standard | d. Room |  | (1) |
| 37. | Material balance is based on law of conservation of --------------------- | | | | CO2 |  |
|  | a. Heat | b.Mass | c.Pressure | d.Energy |  | (1) |
| 38. | For solving simultaneous equation no of equation should be equal to no of | | | | CO2 |  |
|  | a. Variables | b. Constant | c. Pressure | d. Temperature |  | (1) |
| 39. | A substance which do not take part in a unit operation is called ----------- substance in material balance | | | | CO2 |  |
|  | a. Tie | b. Absolute | c.Critical | d.Non critical |  | (1) |
| 40. | In the combustion of carbon in oxygen, oxygen is the -------------- reactant | | | | CO2 |  |
|  | a. Product | b.Excess | c.Limiting | d.Non limiting |  | (1) |

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| **PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)** | | | |
| 41. | A force equal to 25 Kgf is applied on the piston with a diameter of 2 cm. Find the pressure exerted on a piston in KPa. | CO1 | (5) |
| 42. | Show that the Reynold’s no is a dimensionless quantity. The formula for Reynolds No is NRe = DρU/µ, where U is the velocity, D dia of pipe,µ viscosity and ρ density. | CO1 | (5) |
| 43. | Explain standard heat of formation with suitable example. | CO1 | (5) |
| 44. | How many kilogram of CS2 will contain 3.5 Kmol of carbon. | CO1 | (5) |
| 45. | Calculate the density of chlorine gas at 503.15 K and 152 bar using ideal gas law. | CO1 | (5) |
| 46. | Determine the dia of the pipe which discharge 200 liters/min of water with a velocity of 0.4 m/s. | CO1 | (5) |
| 47. | What are the three methods to solve the material balance problems. | CO1 | (5) |
| 48. | Find the ratio of milk with 3.8% fat to milk with 0.5% fat that have to be mixed in order to produce a blend with 3.5% fat. | CO1 | (5) |
| 49. | Find the amount of saturated steam at 270.1 kPa required to heat 100 kg of cans from 50°C to 121°C, if the heat capacity of the cans is 3.5 kJ/kg°C. | CO1 | (5) |
| 50. | How many kg/h of sugar syrup with 10% sugar must be fed to an evaporator to produce 10000 kg/h of sugar syrup with 65% sugar? | CO1 | (5) |
| **PART C( 2 X 10 = 20 MARKS) (ANSWER ANY TWO)** | | | |
| 51. | Starting from Bernoulli equation derive Darcy’s equation for head loss for the fluid flowing through the pipe | CO1 | (10) |
| 52. | On the basis of the data and the chemical reactions given below, find the heat of formation of ZnSO4 from elements.   1. Zn + S (rhomb) ----------- ZnS ∆H = -44 Kcal/Kg mol. 2. 2ZnS + 3O2 ---------------- 2ZnO + 2SO2 ∆H = -221.88 Kcal/kg mole 3. 2SO2 + O2 ------------ 2SO3 ∆H = - 46.88 Kcal/kg mole   iv) ZnO + SO3 ------------ ZnSO4 ∆H = - 55.10 Kcal/kg mole | CO1 | (10) |
| 53. | What are the different equation of state available discuss its merit and demerits | CO1 | (10) |

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