

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

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S6 (R,S) / S6 (PT) (R,S) Examination May 2024 (2019 Scheme)

**Course Code: MET 308****Course name: COMPREHENSIVE COURSE WORK**

Max. Marks: 50

Duration: 1 Hour

- Instructions:**
- (1) Each question carries one mark. No negative marks for wrong answers
  - (2) Total number of questions: 50
  - (3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
  - (4) If more than one option is chosen, it will not be considered for valuation.

1. Specific weight of a fluid is defined as
  - a) Weight per unit volume
  - b) Mass per unit volume
  - c) Weight per unit area
  - d) None of these
2. The viscosity of a gas .....with increase of temperature
  - a) Decreases
  - b) Increases
  - c) Remains unchanged
  - d) First decreases then increases
3. The differential manometers are used for
  - a) Measuring pressure at a point
  - b) Measuring fluid flow pressure
  - c) The difference of pressure between the two points in a pipe
  - d) Used to measure the gauge pressure
4. The force exerted by a static fluid on a vertical horizontal or an inclined plane immersed surface is
  - a)  $F = \rho g A \bar{h}$
  - b)  $F = \frac{\rho g \bar{h}}{A}$
  - c)  $F = mg A \bar{h}$
  - d)  $F = \rho g A \bar{h} \sigma \theta$
5. The point at which the body starts to oscillating when it is tilted is called
  - a) Centre of buoyancy
  - b) Meta centre
  - c) Radius of gyration
  - d) Centre of gravity
6. In a Lagrangian method..... is flowed during motion and its velocity, acceleration, density etc. Are studied
  - a) At a point in the flow
  - b) Single fluid particle
  - c) Between two points
  - d) Below or above the flow
7. In a compressible flow the ..... with time
  - a) Density Changes
  - b) Velocity Remains unchanged
  - c) Depends on the velocity
  - d) Viscosity remains un changed
8. In a uniform flow

- a) Velocity does not with respect to space      b) Velocity changes with time      c) Density and mass flow changes with time.      d) The particles are moved in straight line
9. Venturi meter is working under the principle of  
 a) Newtons law of viscosity      b) Bernoulli's principle      c) Continuity principle      d) Momentum principle
10. The energy loss due to friction in a pipe is given by.....  
 a) Dracy's formula      b) Reynold's number      c) Newtons viscosity number      d) Bernoulli's principle
11. In a macroscopic view which of the following statement is true  
 a) Certain quantity of matter is considered without the events occurring at the molecular level being taken into account      b) Matter in molecular level is considered      c) The flow matter is considered      d) Mass of the system whole considered
12. In a thermodynamic cycle the initial and final state of the system is .....  
 a) Identical      b) Different      c) Changes the mass      d) Mass at the initial state is higher than final state
13. In a constant volume gas thermometer, which of the following property is used to measure the temperature  
 a) Volume      b) Pressure      c) Thermal emf      d) Mass
14. The thermodynamic work is a .....  
 a) Point function      b) Path function      c) End point function      d) Quasi static function
15. Under what condition the work done is equal to  $\int_1^2 p dV$   
 a) During equilibrium condition      b) Process is quasistatic      c) End state point is same      d) During the point function.
16. In a throttling process  
 a) Change in kinetic and potential energy happens      b) NO heat transfer      c) NO change in kinetic energy potential energy and NO heat transfer      d) Kinetic energy changed to potential energy
17. The equation  $TdS = dU + pdV$  can be applied to the processes which are  
 a) Only reversible      b) Only irreversible      c) Reversible or irreversible      d) None of the above
18. A heat engine is supplied with 300kJ/s heat at 600 K and rejects 100 kJ/s at 300 K. The data refers to



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- 19 a) Reversible cycle    b) Irreversible cycle    c) Impossible cycle    d) None of the above
- In order to increase the work capacity of energy transferred by heat transfer from high temperature to low temperature
- 20 a) Temperature difference should be increased    b) Temperature difference should be decreased    c) Higher temperature should be increased keeping temperature difference same    d) Low temperature should be lowered
- Gibbs function is expressed as
- 21 a)  $U + pV - TS$     b)  $U + pV - TdS$     c)  $U + dpdV - TS$     d)  $dU + pV - TS$
- The bond formed between the acceptance and donation of electrons between elements are called
- 22 a) Covalent bond    b) Ionic bond    c) Metallic bond    d) Compound bond
- How many lattice are there in a SC structure
- 23 a) Four    b) Two    c) One    d) Three
- Miller indices represent
- 24 a) Orientation of electrons    b) Orientation of atom    c) Orientation of a plane of atoms    d) Orientation of number of atoms
- The ability of a material to withstand pressure induced distortion is known as
- 25 a) Plasticity    b) Elasticity    c) Porosity    d) Fluidity
- The mechanism explaining the generation of multiple dislocations in specified well spaced slip plane in crystal is known as
- 26 a) Crystallization mechanism    b) Frank read source    c) Dislocation mechanism    d) Super cooling
- The parameter which quantifies the difference between the distorted lattice around the dislocation and the perfect lattice is known as
- 27 a) Miller indices    b) Burger vector    c) Frank read source    d) None of these answers
- The system which shows a complete solubility of each other in solid phase and liquid phase is known as
- 28 a) Isomorphous system    b) Single phase system    c) Mono crystal system    d) None of the above
- The plastic deformation in metals is known as
- 29 a) Slip    b) Rigidity    c) Crack    d) None of these
- In twinning which of the statement is true
- 30 a) Orientation difference happens across the plane    b) Orientation remains unchanged    c) Orientation happens in wide plane    d) It frequently occurs in hexagonal close-packed structure
- Rules that govern the formation of substantial sold solutions between two metals are known as
- 31 a) Free thumb rule    b) Hume Rothery's rule    c) Gibb's phase rule    d) None of the above
- The property of moulding sand which allows gases passes through it is .....
- a) Flowability    b) Corrosivity    c) Porosity    d) Plasticity

- 32 A..... is a sand or metal insert used to shape any part of a casting that cannot be shaped by the primary removable pattern  
 a) Pattern                      b) Sprue                      c) Chaplets                      d) Cores
- 33 Defects occurring due to improper design of gating system is known as  
 a) Shrinkage                      b) Crack                      c) Blow holes                      d) Holes
- 34 Which of the following process used for stress relieving  
 a) Annealing                      b) Hardening                      c) Case hardening                      d) Quenching
- 35 The process of heat treatment that requires a rapid cool from a high temperature is called..  
 a) Quenching                      b) Annealing                      c) Hardening                      d) Tempering
- 36 Which NDT technique given below used for the welded joints ?  
 a) Acid etch test                      b) Free bend test                      c) Eddy current test                      d) Back bend test
- 37 What is a terminate mixture  
 a) A mixture of Al powder and iron oxide                      b) A mixture of Al oxide and copper oxide                      c) Mixture of copper and iron oxide                      d) Mixture of Al oxide and copper oxide
- 38 Friction welding is .....
- a) Molten state welding                      b) Plasma state welding                      c) Solid state welding                      d) Molten metal pool welding
- 39 A hammer drop onto the metal to mould it into the shape of the die is known as  
 a) Drop forging                      b) Open-die forging                      c) Close die forging                      d) None of these
- 40 Which one is the defect in forging  
 a) Inclusion                      b) Cold shut                      c) Process hole                      d) None of these
- 41 Various kinematic pairs are given below. Choose the higher pair  
 a) Roller bearing                      b) Tooth gear in mesh                      c) Cam and follower                      d) All of the above
- 42 In a reciprocating engine  
 a) Piston gudgeon pin form kinematic link                      b) Piston gudgeon pin form one kinematic link                      c) Piston gudgeon pin and connecting rod form kinematic link                      d) None of the above statements are true
- 43 The kinematic chain having N links will have  
 a) N-1 inversions                      b) N inversions                      c) N-2 inversions                      d) N-3 inversions
- 44 A mechanism having n links will have the number of instantaneous centres equal to  
 a) 2n                      b) n(n-1)                      c) (n-2)                      d) n(n-1)/2
- 45 In a four-bar mechanism the mechanical advantage is maximum when the velocity ratio is  
 a) Maximum                      b) Minimum                      c) 1                      d) 1/2
- 46 The direction of Coriolis's component acceleration is such that it  
 a) Leads the sliding velocity vector by  $90^\circ$                       b) Lags the sliding velocity vector by  $90^\circ$                       c) Is parallel to the sliding velocity vector                      d) Depends upon the ratio of normal acceleration



- 47 The cams are classified on the basis of
- a) Surface in contact between cams and follower
  - b) Types of movement of the follower on the cam
  - c) Line of motion of follower with respect to axis of cam
  - d) All of the above
- 48 The path described by the trace point as referred to a cam is known as
- a) Base circle
  - b) Prime circle
  - c) Pitch circle
  - d) None of the above
- 49 The stroke of the follower is equal to
- a) Half the travel of the follower from base circle
  - b) Maximum travel of the follower from the base circle
  - c) Half the travel of the follower from Pitch circle
  - d) maximum travel of the follower from pitch circle
- 50 Automobile engines normally use cam and follower arrangement
- a) With knife edge follower
  - b) Roller follower
  - c) Mushroom follower with flat face
  - d) Mushroom follower with spherical face