

RECRUITMENT TEST FOR ASSISTANT PROFESSOR IN MECHANICAL ENGINEERING

1. A body is thrown from a balloon which is moving at a speed of 15m/s and it at a height of 100m. The final velocity before it just touches the ground is
  - a)  $5\sqrt{89}$
  - b)  $6\sqrt{89}$
  - c)  $7\sqrt{89}$
  - d)  $8\sqrt{89}$
2. In a projectile motion, the angle between velocity and acceleration at the peak point is
  - a)  $180^\circ$
  - b)  $45^\circ$
  - c)  $90^\circ$
  - d)  $135^\circ$
3. Modulus of rigidity is the ratio of
  - a) Linear stress and lateral strain
  - b) Volumetric stress and linear strain
  - c) Shear stress and shear strain
  - d) Volumetric stress and Volumetric strain
4. In case of thin cylinder, the ratio of longitudinal stress to hoop stress is
  - a)  $\frac{1}{4}$
  - b)  $\frac{1}{2}$
  - c) 2
  - d) 3
5. An example of turning pair is
  - a) Piston and cylinder
  - b) Ball and socket joint
  - c) Bolt and nut
  - d) Shaft with collar at both ends fitted in a circular hole
6. For 6 links in a mechanism number of pairs would be
  - a) 3
  - b) 5
  - c) 6
  - d) 12

7. Degree of freedom is
  - a) Equal to number of independent displacements
  - b) Number of masses in the system
  - c) Always less than 3
  - d) None of the above
8. Factor of safety for a ductile material is the ratio of
  - a) Endurance limit to Young's modulus
  - b) Endurance limit to working stress
  - c) Ultimate strength to working stress
  - d) Yield stress to working stress
9. Large pressure angle compared to small pressure angle results in
  - a) Weak gear
  - b) Strong gear
  - c) Strength remain the same
  - d) None of the above
10. Ideal fluids are
  - a) Having viscosity
  - b) Having surface tension
  - c) Are incompressible
  - d) None of the above
11. Hydraulic gradient line is the sum of
  - a) Pressure head and velocity head
  - b) Pressure head and datum head
  - c) Velocity head and datum head
  - d) None of the above
12. If the specific speed of a turbine is 6 , then the turbine should be
  - a) Propeller
  - b) Thomson
  - c) Francis
  - d) Pelton wheel
13. An ideal regenerative cycle for the same heat supplied and the same rejection temperature has an efficiency
  - a) Less than Carnot cycle
  - b) Equal to Carnot cycle
  - c) More than Carnot cycle
  - d) None of the above

14. Rateau turbines are
- a) Velocity compounded impulse turbine
  - b) Pressure compounded impulse turbine
  - c) Simple impulse
  - d) Multi stage turbine
15. In which part of a convergent divergent nozzle mach number is greater than 1
- a) Divergent
  - b) Convergent
  - c) Straight
  - d) Throat
16. Mean piston speed is given by
- a)  $2 \times \text{Stroke length} \times \text{Engine speed}$
  - b)  $2 \times (\text{Stroke length}/\text{Engine speed})$
  - c)  $4 \times \text{Stroke length} \times \text{Engine speed}$
  - d)  $4 \times (\text{Stroke length}/\text{Engine speed})$
17. Flash point for diesel fuel oil is nearest to
- a) 50 degree Celsius
  - b) 100 degree Celsius
  - c) 300 degree Celsius
  - d) 400 degree Celsius
18. The thermal efficiency of a gas turbine as compared to diesel plant is
- a) Lower
  - b) Similar
  - c) Higher
  - d) No comparison
19. Nusselt number is a function of
- a) Weber and Biot number
  - b) Stanton number
  - c) Mach number and Euler number
  - d) Grashoff's and Prandtl number
20. Which of the following law signifies the wavelength for maximum emmissive power
- a) Wein's law
  - b) Stefan- Boltzmann's law
  - c) Newton's law
  - d) Kirchhoff's law

21. For a sphere cube and cone of same volume , material and conductivity if heated to a temperature and then cooled , cooling rate will be maximum in
- a) Sphere
  - b) Cube
  - c) Cone
  - d) Same in all the three
22. Undercooling of refrigerant leads to
- a) Decreased refrigerant effect
  - b) Reduced work done
  - c) Reduced COP
  - d) Increased the COP of the cycle
23. For a dry saturated air , the total heat is
- a) Same as sensible heat
  - b) Same as latent heat
  - c) Sum of sensible and latent heat
  - d) None of the above
24. Dew point temperature is the temperature at which condensation begins when the air is cooled at constant
- a) Volume
  - b) Entropy
  - c) Pressure
  - d) Enthalpy
25. Austempering process results in formation of
- a) Troostite
  - b) Bainite
  - c) Cementite
  - d) Martensite
26. Spring steel should be resistant to
- a) Fatigue
  - b) Corrosion
  - c) Deformation
  - d) High temperature
27. Graphite as a mould is advantageous in usage because
- a) It is light in weight
  - b) It is heat resistant
  - c) It has non- wetting action
  - d) It helps in lowering the cooling rate

28. Staking is a process of
- Mixing two metal powders properly
  - Fastening two parts permanently with the help of a shaped punch
  - Producing a raised design on the surface of a workpiece
  - Increase the fatigue strength of the work piece
29. Green strength in powder metallurgy
- Strength of the unsintered component
  - Strength of the sintered component
  - The temperature of sintering
  - None of the above
30. In welding copper alloys with TIG arc welding
- AC is used
  - DC with straight polarity
  - DC with reverse polarity
  - None of the above
31. Magnetic arc blow is
- Manually hammering done on workpiece
  - Occurs when the welding is done near the poles
  - Current controlling technique
  - Splatter because of magnetic field
32. Minimum shear strain in orthogonal turning with a cutting tool of zero rake angle is
- 0.0
  - 0.5
  - 1.0
  - 2.0
33. Arbors are used to
- Hold the milling cutter on the machine
  - To increase the metal removal rate
  - Dissipate heat formed during machining
  - Increased frictional coefficient
34. Electrical comparators are designed on the basis of
- Wheatstone bridge
  - Heating effects of current
  - Thomson effect
  - Peltier effect

35. Several machine tools can be controlled by a central computer in
- NC Machine tool
  - CNC Machine tool
  - CCNC Machine tool
  - DNC Machine tool
36. CNC drilling machine is considered to be a
- Servo Controlled machine
  - Continuous path controlled machine
  - Straight line controlled machine
  - Point-to-point controlled machine
37. Which of the following code is used to specify coolant on
- M05
  - M08
  - M09
  - M02
38. Operations research is the application of \_\_\_\_\_ methods to arrive at the optimal solutions to the problems.
- Economical
  - Scientific
  - Both a and b
  - Artistic
39. The Operations research technique which helps in minimizing total waiting and service costs is
- Queuing Theory
  - Decision Theory
  - Both (a) and (b)
  - None of the above
40. Both transportation and assignment problems are members of a category of LP problems called
- Shipping problem
  - Logistic problem
  - Routing problems
  - Network flow problems
41. How jigs are in terms of weight compared to fixtures?
- Jigs are lighter than fixtures
  - Jigs are heavier than fixtures
  - Jigs are equal in weight of fixture for the same operation
  - None of the above

42. Name the file type that is normally exported from CAD software.
- a) SLDRT
  - b) JPG
  - c) STL
  - d) X3G
43. Fused Deposition modelling technique involves
- a) Use of powdered raw material
  - b) Use of raw material in the form of wire
  - c) Both the above
  - d) None of the above
44. Cp and Cpk, are the process capability indices which are used to
- a) define the ability of a process to produce a product that meets requirements.
  - b) Indication of the surface finish of the product
  - c) Indicate the hardness of the product
  - d) None of the above
45. The full form of EDS is
- a) Energy dispersive X-ray spectroscope
  - b) Energy dissipative X-ray spectroscope
  - c) Energy dispersive Gamma-ray spectroscope
  - d) Energy dissipative Gamma-ray spectroscope
46. Which of the following is not a type of Centrifugal casting
- a) True Centrifugal casting
  - b) Semi- Centrifugal casting
  - c) Centrifuging
  - d) Centrifugal Investment casting
47. Which of the following components is mainly manufactured by performing metal forging?
- a) Piston
  - b) Engine block
  - c) Crankcase
  - d) Connecting rod
48. Which of the following metal forming processes is best suitable for making the wires?
- a) Drawing
  - b) Forging
  - c) Extrusion
  - d) Rolling

49. Which among the following is not a type of Non-destructive testing?
- a) Visual test
  - b) Compression test
  - c) Eddy current test
  - d) Ultrasonic test
50. Which test is used to determine dimensions of any object?
- a) Ultrasonic test
  - b) Torsion test
  - c) Eddy current test
  - d) All the above
51. Vacuum is the medium for which type of machining?
- a) LBM
  - b) WJM
  - c) AJM
  - d) EBM
52. Which of the following can be used as an Electrolyte in the STEM process?
- a) Sulphuric acid
  - b) Nitric acid
  - c) Hydrochloric acid
  - d) All the above
53. A hall effect switch is used
- a) Measure voltage
  - b) Measure temperature
  - c) Sense vacuum
  - d) Sense presence of magnetic field
54. If the frequency of the input signal to a system is increased, the amplitude of the output \_\_\_\_\_.
- a) Starts reducing
  - b) Starts increasing
  - c) Remains constant
  - d) Unpredictable
55. On-off Control is also called as
- a) One position control
  - b) Two position control
  - c) Three position control
  - d) Four position control

56. What is least square line?
- a) A line of fit which has sum of errors minimum
  - b) A line of fit which has sum of errors maximum
  - c) A line of fit which has sum of squares of errors minimum
  - d) None of the above
57. If natural light is used as the principal means of illumination at workspace, windows area needs to be equal to \_\_\_ percent of floor area.
- a) 20
  - b) 30
  - c) 40
  - d) 50
58. The safe exposure limits for noise levels for 08 hours of working/day is
- a) 90 dBA
  - b) 110 dBA
  - c) 130 dBA
  - d) 150 dBA
59. The very first thing you should do if you are the first to witness or discover an accident on the job site is to
- a) Go find at least one co-worker to help you so you can work as a team
  - b) Go to the scene and help the person(s) injured
  - c) Find and fill out the necessary forms to document the incident
  - d) Activate the emergency response system
60. Arc blast is caused by
- a) Poor contact within electrical wire splices
  - b) Radio frequency emissions from high-power transmitters
  - c) Discharge of high electrical current through open air
  - d) Failure to lock-out and tag-out electrical breakers