

MIZORAM PUBLIC SERVICE COMMISSION

TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF JUNIOR ENGINEER UNDER PUBLIC HEALTH ENGINEERING DEPARTMENT, GOVERNMENT OF MIZORAM. JUNE-2019

MECHANICAL ENGINEERING

PAPER - I

Time Allowed : 2 hours

Full Marks : 150

Attempt all questions.

All questions carry equal marks of two (2) each

1. Whenever a material is loaded within elastic limit, stress is.....strain.
(a) equal to (b) inversely proportional to
(c) directly proportional to
2. Poisson's ratio is the ratio of linear strain to the volumetric strain.
(a) True (b) False
3. The direct stress, across a principal plane is known as principal stress
(a) Yes (b) No
4. The unit of stress in S.I. unit is -
(a) N/mm^2 (b) KN/mm^2
(c) N/m^2 (d) All of these
5. Hook's Law holds good up to -
(a) Yield point (b) Breaking point
(c) Elastic Limit (d) Plastic Limit
6. Young's modulus may be defined as the ratio of -
(a) linear stress to linear strain (b) linear stress to lateral strain
(c) lateral strain to linear strain (d) shear stress to shear strain
7. Shear modulus is the ratio of -
(a) linear stress to linear strain (b) shear stress to shear strain
(c) linear strain to lateral strain (d) volumetric strain to linear strain
8. A beam supported at its both ends is not simply supported beam
(a) True (b) False
9. A beam which is fixed at one end and free at the other is called
(a) fixed beam (b) simply supported beam
(c) over hanging beam (d) cantilever beam
10. The design of thin cylindrical shells is based on
(a) longitudinal stress
(b) arithmetic mean of the hoop and the longitudinal stress
(c) geometric mean of the hoop and the longitudinal stress
(d) hoop stress

11. A pressure vessel is said to be a thin shell when the ratio of wall thickness of the vessel to its diameter is 1/10
 - (a) equal to
 - (b) less than
 - (c) greater than
12. The difference between the upper limit and lower limit of a dimension is called
 - (a) nominal size
 - (b) tolerance
 - (c) basic size
 - (d) actual size
13. Gears are casted by -
 - (a) Permanent mould casting
 - (b) sand mould casting
 - (c) Slush casting
 - (d) centrifugal casting
14. In a belt drive, if the pulley diameter is doubled keeping the tension and belt width constant, then it will be necessary to -
 - (a) increase the key length
 - (b) decrease the key length
 - (c) increase the key width
 - (d) increase the key depth
15. When a machine member is subjected to torsion, the torsional shear stress set up in the member is-
 - (a) maximum at the centroidal axis and zero at the outer surface of the member
 - (b) zero at both centroidal axis and outer surface of the member
 - (c) maximum at both the centroidal axis and outer surface of the member
 - (d) zero at the centroidal axis and maximum at the outer surface of the member
16. A screw is specified by its
 - (a) minor diameter
 - (b) pitch diameter
 - (c) pitch
 - (d) major diameter
17. The set screws are used to prevent relative motion between the two parts
 - (a) Wrong
 - (b) Right
18. A shaft is a rotating machine element
 - (a) Correct
 - (b) Incorrect
19. Screws used for power transmission should have
 - (a) low efficiency
 - (b) high efficiency
 - (c) very fine threads
 - (d) strong teeth
20. The power transmitted by means of a belt depends upon
 - (a) velocity of the belt
 - (b) tension under which the belt is placed on the pulleys
 - (c) arc of contact between the belt and the smaller pulley
 - (d) all of the above
21. The V-belt is used to transmit great amount of power and when the pulleys are very near to each other
 - (a) Correct
 - (b) Incorrect
22. The cam and follower is an example of
 - (a) lower pair
 - (b) sliding pair
 - (c) rolling pair
 - (d) higher pair

23. An automobile steering gear is an example of
(a) higher pair (b) rolling pair
(c) lower pair (d) sliding pair
24. V-belts are usually used for
(a) long and short drives (b) short drives
(c) long drives (d) none of these
25. Which of the following is used to control the speed of variation of the engine caused by the fluctuations of the engine turning moment ?
(a) flywheel (b) D-slide valve
(c) Meyer's expansion valve (d) Governor
26. When the speed of the engine fluctuates continuously above and below the mean speed, the governor is said to be
(a) Stable (b) Hunt
(c) Unstable (d) Isochronous
27. The brake commonly used in motor cars is internal expanding brake
(a) True (b) False
28. For static balancing of a shaft, the net dynamic force acting on the shaft is equal to zero
(a) Agree (b) Disagree
29. A mechanism consisting of four links is calledmechanism
(a) Compound (b) Simple
30. The height of a Watt's governor is
(a) directly proportional to speed (b) directly proportional to (speed)²
(c) inversely proportional to (speed)² (d) inversely proportional to speed
31. A Watt's governor is a spring loaded governor
(a) Yes (b) No
32. The cam follower generally used in air-craft engine is
(a) Knife edge follower (b) flat faced follower
(c) spherical faced follower (d) roller follower
33. The balancing of a rigid rotor can be achieved by appropriately placing balancing masses in
(a) a single plane (b) two planes
(c) three planes (d) four planes
34. Mild steel during machining produces chips
(a) Continuous (b) Discontinuous
35. The type of tool used on lathe, sharper and planer is
(a) Three Point cutting tool (b) Multi-point cutting tool
(c) Single point cutting tool (d) Two point cutting tool
36. In which of the following machine, the work rotates and the tool is stationary ?
(a) Vertical boring machine (b) Precision boring machine
(c) Jig boring machine (d) Horizontal boring machine

37. In drilling operation, the metal is removed by
(a) shearing and compression (b) shearing
(c) extrusion (d) shearing and extrusion
38. Lathe bed is made of
(a) pig iron (b) chilled cast iron
(c) alloy steel (d) mild steel
39. A machine tool that removes metal as the work is fed against a rotating multipoint cutter is
(a) milling machine (b) grinding machine
(c) boring machine (d) gear hobbing machine
40. A machine used to bore holes in large and heavy parts such as an engine frame, steam engine cylinders, machine housing etc is
(a) grinding machine (b) boring machine
(c) planing machine (d) milling machine
41. A process of generating a gear by means of a cutter that revolves and cuts like a milling cutter is called
(a) Gear hobbing (b) Rack cutter process
(c) slotting (d) None of the above
42. A production lathe which is used to manufacture any number of identical pieces in the minimum time is
(a) Engine lathe (b) A capstan and turret lathe
(c) Speed lathe (d) None of the above
43. Which is not precision grinder
(a) cylinder grinder (b) surface grinder
(c) internal grinder (d) abrasive belt grinder
44. The purpose of a gate is to
(a) act as the reservoir for the molten metal
(b) deliver molten metal into the mould cavity
(c) deliver molten metal from pouring basin to gate
(d) feed the molten metal to the casting in order to compensate for the shrinkage
45. Which of the following material can be used for making patterns ?
(a) Aluminium (b) Wax
(c) Lead (d) All of these
46. In die casting, machine allowance is
(a) not provided (b) small
(c) large (d) very large
47. The operation of cutting a flat sheet to the desired shape is called
(a) shearing (b) piercing
(c) blanking (d) punching

48. For arc welding
- (a) alternating current with high frequency is used
 - (b) direct current is used
 - (c) alternating current with low frequency is used
 - (d) all of these
49. In arc welding, the electric arc is produced between the work and the electrode by -
- (a) voltage
 - (b) flow of current
 - (c) contact resistance
 - (d) all of these
50. The material which can be best cut with oxygen cutting process is
- (a) brass
 - (b) copper
 - (c) aluminium
 - (d) mild steel
51. The oxy-acetylene gas used in gas welding produce a flame temperature of
- (a) 1800°C
 - (b) 2100°C
 - (c) 2400°C
 - (d) 3200°C
52. A substance that possesses metallic properties and is composed of two or more elements, of which at least one is metal, is called an alloy
- (a) True
 - (b) False
53. Which is not the typical forging operations
- (a) bending
 - (b) balancing
 - (c) welding
 - (d) cutting
54. Heat treatment of steel not included the following processes
- (a) annealing
 - (b) normalising
 - (c) hardening
 - (d) supercharging
55. A process of joining similar metal by application of heat with or without application of pressure & addition of filler material -
- (a) welding
 - (b) balancing
 - (c) rivetting
 - (d) none of these
56. A welding which is done by burning a combustible gas with air or oxygen in a concentrated flame of high temperature is
- (a) Braze welding
 - (b) Electric welding
 - (c) Gas welding
 - (d) Arc welding
57. Heat treatment refers to a combination of processing of a metal or alloy in the solidstate of the purpose of obtaining desired properties
- (a) heating & cooling
 - (b) welding & lighting
 - (c) balancing & wiring
 - (d) none of these
58. Cutting work of iron and steel with the aid of oxygen which is extensively used nowadays in industry is
- (a) Electric cutting
 - (b) Arc cutting
 - (c) Oxygen cutting
 - (d) None of these

59. The most important functions of inventory (Stock) control are
- (a) to have good stock control system
 - (b) to have technical responsibility for the state of materials
 - (c) to run the stores effectively
 - (d) all of these
60. The programme evaluation review technique (PERT) is a project planning and control technique. It is an event oriented technique
- (a) True
 - (b) False
61. Product layout is used for
- (a) job production
 - (b) batch production
 - (c) mass production
 - (d) all of these
62. CPM stands for
- (a) Critical Process Method
 - (b) Combined Process Method
 - (c) Critical Path Method
 - (d) Common Planning Method
63. Actual performance of a task is called
- (a) an event
 - (b) an activity
 - (c) a duration
 - (d) none of these
64. Which of the following charts are used for plant layout design ?
- (a) Operation process chart
 - (b) Man machine chart
 - (c) Travel chart
 - (d) All of these
65. Which one is not part of important steps for project planning
- (a) Market survey
 - (b) Project capacity
 - (c) Selection of site
 - (d) None of these
66. Which one is not part of important factors which are required to be considered for selection of exact plant location
- (a) Easy access
 - (b) Availability of cheap, sufficient and suitable land
 - (c) cost of material required for construction
 - (d) none of these
67. What is a prime consideration in designing the new plant building
- (a) Material handling
 - (b) Drawings
 - (c) Machine loading
 - (d) Value engineering
68. The method of measuring and/or checking the quality of a product in terms of specified standard
- (a) Manufacturing
 - (b) Inspection
 - (c) Material handling
 - (d) None of these
69. What is not basic area of inspection
- (a) Receiving Inspection
 - (b) Final Inspection
 - (c) Inprocess Inspection
 - (d) Production

70. Inspection is considered to be a tool of
(a) Quality control (b) Material management
(c) Production control (d) Plant layout
71. A machine tool is a device by which jobs are shaped in desired sizes by removing the excess materials in the form of chips
(a) True (b) False
72. A gauge which is used as a reference gauge with which inspection gauges are periodically compared is called Master gauge -
(a) True (b) False
73. The unit of plane angle is the Radian, which is defined as the angle between two radii of a circle, cutting off on the circumference on arc equal in length to the radius -
(a) True (b) False
74. Tolerance may be defined as the difference between the maximum and minimum sizes allowed or the difference between the high and low limits
(a) True (b) False
75. The principal types of fit are
(a) Interference (b) Transition
(c) Clearance (d) All of these

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