

MIZORAM PUBLIC SERVICE COMMISSION

TECHNICAL COMPETITIVE EXAMINATIONS FOR RECRUITMENT TO THE POST OF MOTOR VEHICLE INSPECTOR UNDER GOVERNMENT OF MIZORAM JANUARY, 2014

MECHANICAL ENGINEERING PAPER – I

Time Allowed : 2 hours

Full Marks : 150

All questions carry equal marks of 2 each.

Attempt all questions.

- The two basic types of internal combustion engines are the -
 - piston and reciprocating
 - reciprocating and rotary
 - reciprocating and pushrod
 - rotary and spark ignition
- Mechanic A says that, in the engine, the air temperature increases with increasing pressure. Mechanic B says that pressure increases with increasing temperature. Who is right?
 - mechanic A
 - mechanic B
 - both mechanic A and B
 - neither mechanic A nor B
- The four operations i.e, suction, compression, expansion and exhaust in a four stroke cycle engine are completed in the number of revolutions of the crankshaft equal to –
 - one
 - two
 - three
 - four
- The flywheel used in two-stroke cycle engine as compared to four stroke cycle engine is
 - heavy in weight
 - same in weight
 - light in weight
 - none of these
- In Diesel engine, the ignition takes place
 - automatically due to high temperature of compressed air
 - automatically due to high temperature of compressed fuel
 - by means of spark
 - none of these
- Brake mean Effective Pressure in an engine depends upon its
 - speed only
 - torque only
 - speed and torque
 - speed and power
- In I.C. engine, the stroke in which the inlet valve is open and the exhaust valve is closed is called
 - Exhaust stroke
 - Power stroke
 - Compression stroke
 - Suction stroke
- In four stroke cycle engine, one cycle is completed in
 - 180 degree
 - 360 degree
 - 540 degree
 - 720 degree

9. S.I. engine is based on
 - (a) diesel cycle
 - (b) otto cycle
 - (c) dual cycle
 - (d) multi-cycle
10. Which of the following is not basic type of cylinder arrangement?
 - (a) opposed cylinder engine
 - (b) opposed piston engine
 - (c) radial engine
 - (d) circular engine
11. In the I.C. engines, the ratio of thermal efficiency of an actual cycle to that of the ideal cycle is called
 - (a) thermal efficiency
 - (b) mechanical efficiency
 - (c) volumetric efficiency
 - (d) relative efficiency
12. In four stroke C.I. engine, during the suction stroke
 - (a) only air is inducted
 - (b) only fuel is inducted
 - (c) fuel – air mixture is inducted
 - (d) none of these
13. The field of knowledge dealing with the problems of measurement is
 - (a) metrology
 - (b) science of measurement
 - (c) both (a) and (b)
 - (d) none of these
14. The degree of agreement of the measured size with its true magnitude as expressed in standard units of measurements is
 - (a) precision
 - (b) accuracy
 - (c) sensitivity
 - (d) all of these
15. A vernier scale consists of 25 divisions on 12mm spacing and the main scale has 24 divisions on 12mm. What is the least count?
 - (a) 0.01mm
 - (b) 0.02mm
 - (c) 0.04mm
 - (d) none of these
16. For measurement of miniature hole, Dial gauge used is
 - (a) dial pipe gauge
 - (b) dial depth gauge
 - (c) bore gauges
 - (d) all of these
17. A measuring instrument in which the ends of a dimension being measured aligned with the graduations of the scale from which the length is read directly is
 - (a) a line measuring devices
 - (b) end measuring devices
 - (c) transfer type
 - (d) precision type
18. Which of the following is not a surface measuring instrument?
 - (a) optical flat
 - (b) straight edge
 - (c) spirit levels
 - (d) profilometer
19. Which of the following is not a thickness gauge?
 - (a) feeler gauge
 - (b) plate gauge
 - (c) plug gauge
 - (d) wire gauge
20. A combination set is a measuring instrument which combines
 - (a) two heads
 - (b) three heads
 - (c) four heads
 - (d) six heads

21. Milling is the process of removing metal by feeding the work past a rotating.
- (a) single point cutter (b) two point cutter
(c) multi point cutter (d) none of these
22. Which of the following operations can be performed by a drilling machine
- (a) spot facing (b) reaming
(c) boring (d) all of these
23. The term Hard or Soft in the context of grinding wheels refers to
- (a) the hardness of the abrasive (b) the strength of the bonding material
(c) the hardness of the bonding material (d) none of these
24. Gear hobbing machine can cut at a time
- (a) One teeth (b) Two teeth
(c) Several teeth (d) None of these
25. The device which holds and locates a workpiece and guides and controls cutting tool is known as
- (a) Fixture (b) Jig
(c) Lathe (d) Template
26. In horizontal boring machine, the cross slide is fitted on the
- (a) saddle (b) table
(c) headstock (d) end supporting column
27. Over a given equal period of time, capstan and turret lathe will produce
- (a) less number of pieces than engine lathe
(b) more number of pieces than engine lathe
(c) equal number of pieces as that of engine lathe
(d) none of these
28. When grinding is done with specially shaped grinding wheels, it is called
- (a) surface grinding (b) form grinding
(c) snagging (d) off-hand grinding
29. A high rate of production is secured on gear hobbing machines because the cutting action is continuous in
- (a) one direction (b) two directions
(c) three directions (d) four directions
30. Which of the following cannot be produced by gear hobbers?
- (a) splines (b) chain sprockets
(c) unsymmetrical shapes (d) spur gears
31. The process in which hydrocarbons are decomposed into smaller hydrocarbons is called
- (a) cracking (b) reforming
(c) polymerisation (d) alkylation
32. The octane number of Iso-octane is
- (a) 0 (b) 10
(c) 80 (d) 100

33. The venturi in the carburetor causes the
(a) increase of air velocity (b) decrease of air velocity
(c) decrease of fuel flow (d) decrease of manifold vacuum
34. The performance of turbo charged engine is not improved at
(a) low engine speeds (b) high engine speeds
(b) medium engine speeds (d) none of these
35. A gasoline that detonate easily is called
(a) high – octane gasoline (b) low – octane gasoline
(c) unleaded gasoline (d) blended fuel
36. When the air – fuel mixture ignites before the spark takes place at the spark plug, the condition is called
(a) detonation (b) ignition
(c) pre – ignition (d) rumble
37. A high cetane number fuel will
(a) ignite easily (b) not ignite easily
(c) cause detonation (d) cause combustion knock
38. The two types of fuel gauges normally in practice are
(a) thermostatic and magnetic (b) electrical and mechanical
(c) pressure and vacuum (d) vacuum and electrical
39. The main constituent of Ferrous metal is
(a) iron (b) manganese
(c) silicon (d) none of these
40. Steel is an alloy of Iron and Carbon with substantial quantities of manganese and silicon, carbon content of which is generally less than
(a) 2% (b) 3%
(c) 6.67% (d) None of these
41. Case hardening is done by
(a) carburising (b) nitriding
(c) cyanide hardening (d) all of the above.
42. Solder which is an alloy of lead-tin melts in the range -
(a) 100°-160°C (b) 160°-300°C
(c) 300°-500°C (d) 750-980°C
43. The oxygen (gas) cutting process can cut
(a) brass (b) bronze
(c) alluminium (d) mild steel
44. For most common gases and vapours at the atmospheric pressure, the arc temperature is of the order of
(a) 4000°C (b) 5000°C
(c) 6000°C (d) None of these

45. Which of the following brazing is most suitable for large-scale production?
(a) torch brazing (b) furnace brazing
(c) resistance brazing (d) immersion brazing
46. In soft soldering, the solder is mostly composed of
(a) aluminum and zinc (b) copper and tin
(c) lead and tin (d) aluminum and lead
47. In the leftward welding, the weld is made working from
(a) left to right (b) right to left
(c) centre to right (d) right to centre
48. Oxy-acetylene welding is particularly suitable for joining metal sheets and plates having thickness of 2 mm to
(a) 50 mm (b) 80 mm
(c) 100 mm (d) 120 mm
49. Which of the following is not an arc welding process?
(a) TIG welding (b) Electro slag welding
(c) Electro gas welding (d) Seam welding
50. A heat treatment process of steel that enables the metal to obtain high strength and good ductility is called
(a) ausforming (b) maraging
(c) martempering (d) austempering
51. The cooling system having water pump is
(a) Thermo syphonic system (b) Forced feed system
(c) Direct cooling system (d) Indirect cooling system
52. The purpose of the thermostat is to keep the engine
(a) hot (b) cool
(c) at desired temperature (d) none of these
53. Engine overheating may result due to
(a) radiator pressure cap stuck closed (b) thermostat stuck open
(c) broken fan belt (d) excess coolant in the system
54. The part of the cooling - system thermostat that opens and closes the valve is the
(a) seater (b) wax pellet
(c) pressure valve (d) vacuum valve
55. The device in the cooling system that raises the boiling point of the coolant in the system is called the
(a) pressure cap (b) vacuum valve
(c) radiator (d) water jacket
56. The primary function of lubrication is to
(a) provide cooling effect (b) provide sealing action
(c) provide cleaning action (d) reduce wear
57. The most commonly used lubrication system in automobile is
(a) petroil system (b) splash system
(c) pressure system (d) none of these

58. Most commonly used lubricants in automobiles are the
(a) animal oils (b) mineral oils
(c) vegetable oils (d) synthetic oils
59. Select the gauge used to measure oil level at oil sump
(a) feeler gauge (b) plastic gauge
(c) oil pressure gauge (d) dip stick
60. The purpose of the relief valve in the lubricating system is to
(a) ensure maximum pressure (b) prevent excessive pressure
(c) prevent insufficient lubrication (d) ensure adequate oil circulation
61. The two types of commonly used oil pumps in automotive engines are called
(a) gear and piston (b) rotor and piston
(c) gear and rotor (d) full flow and by-pass
62. The purpose of the crankcase ventilation is to
(a) remove liquid gasoline and water (b) cool the oil
(c) supply oxygen to the crankcase (d) remove sludge and sediment
63. In automobile engineering SAE stands for
(a) Society of Automotive Engines (b) Selling Automobile Engines
(c) Society of Automotive Engineers (d) Small Automotive Engines
64. Aluminium is the best of the metals for making pattern, because it is
(a) easy to work (b) resistant to corrosion
(c) light in weight (d) all of these
65. A core is used in the mould to
(a) obtain hole or desired cavities (b) reduce metal erosion in gate and runners
(c) retard foreign matter in the melt (d) all of these
66. In case of casting, the molten metal is introduced into a mould of the desired shape and the molten metal is allowed to solidify. The shape of the casting from the mould
(a) is same but slightly bigger (b) is same but slightly smaller
(c) is same and size is also same (d) none of these
67. An impression formed in a damp sand or other suitable material is called
(a) pattern (b) fettling
(c) core (d) mould
68. Pattern for very large castings would require a tremendous amount of timber for a full pattern, to give the general contour and size of the desired casting, we will require
(a) sweep pattern (b) skeleton pattern
(c) segmental pattern (d) shell pattern
69. When a horizontal core does not extend entirely through the casting, and the core is supported at one end only, in such case, we will use
(a) vertical core print (b) hanging core print
(c) wing core print (d) balancing core print

70. Normally, for production of rods, pipes, sheet metal and other articles known as semifinished products, the type of casting process used will be
- (a) centrifugal casting
 - (b) continuous casting
 - (c) centrifuged casting
 - (d) semi-centrifuged casting
71. The type of wheel which cannot be used with a tubeless tyre is
- (a) disc wheel
 - (b) wire wheel
 - (c) light alloy steel
 - (d) composite wheel
72. The term 'ply rating' with reference to a tyre refers to the
- (a) actual number of plies
 - (b) recommended inflation pressure
 - (c) aspect ratio
 - (d) rated strength
73. An overinflated tyre will wear the tread most near the
- (a) edges
 - (b) corners
 - (c) outside
 - (d) centre
74. Two general types of tyres are
- (a) tube type and tubeless
 - (b) solid and tubeless
 - (c) air and pneumatic
 - (d) split-rim and drop-centre
75. Which of the following is not part of a wheel?
- (a) valve hole
 - (b) centre hole
 - (c) waddle
 - (d) flange

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