

### **Subjective questions on MDT-03**

1. What is a power pack? Explain the construction of power pack fitted on Alco locomotive.
2. What is a power pack? Explain the construction of power pack GM locomotive
3. What are the various assemblies fitted on power pack of Alco locomotive
4. What are the various assemblies fitted on power of GM locomotive
5. What are the various assemblies/equipments which gets drive from power pack in Alco locomotive?
6. What are the various assemblies which gets drive from power pack in GM locomotive
7. What is a cylinder head? What are the properties of material used for manufacturing of cylinder head?
8. What are the various reasons due to which cylinder heads get cracked during service period?
9. Explain the overhauling procedure of cylinder head used in Alco loco.
10. What are the various tests which are carried out to ensure successful service of cylinder head?
11. Explain the procedure of change of valves fitted on cylinder heads.
12. What do you understand by 251 plus cylinder head what are the properties which are improved as comparison to conventional cylinder head.
13. What is cylinder liner? What are the chemical properties of cylinder liner? What are the reasons due to which liner gets failed during service period?
14. Explain the procedure for change of liner on engine block of locomotive.
15. What are the locations from which coolant water is circulating about the liner surface in Alco locomotive?
16. What is the difference between liner used in Alco locomotive and in GM locomotive?
17. What are the locations of thermal cracks on liner? How cooling is done in Liners fitted on GM locomotives.
18. What are the various dimensional checks which are carried out during fitment of liner on engine block?
19. What is connecting rod? Describe the constructional detail of connecting rod. What are the various reasons of failures of connecting rod?
20. What are the types of connecting rod fitted on GM locomotives? How fork and blade rods are connected at one location in GM locomotive.
21. What are the various dimensional checks which are being carried out on connecting rod before fitment on engine block?
22. What is a CAM shaft? How it gets drive in locomotive. What are the various lobes available on the camshaft?
23. What are the various reasons due to which a camshaft gets fail during locomotive service?
24. Explain the fitment procedure of camshaft on Alco locomotive.
25. What is a stiffer unit camshaft? What are the advantages of SUCS over conventional camshaft?
26. What is supercharging, what is its benefit? What are various method of supercharging explain any one of them.
27. Explain the construction of the turbo supercharger fitted on Alco locomotive.
28. What are the various tests which are being carried out to check proper operation of turbo supercharger fitted on locomotive?
29. Explain the construction of turbo supercharger with diagram fitted on locomotive.

30. What are the various factors which affects the life of turbo supercharger what are the defects due to which a turbocharger gets failed during service.
31. What are the difference between turbocharger fitted on Alco locomotive and turbocharger fitted on GM locomotive?
32. Explain the construction of turbo supercharger fitted on GM locomotive how the turbocharger gets drive in locomotive.
33. What is pre lubrication, why it is important in case of turbocharger provided on GM locomotives.
34. What is Booster Air Pressure at which location it is generated and used? Is there any connection of horse power generated by engine with the booster air pressure, what are the reasons of low booster air pressure?
35. What are the locations which are to be examined in case of low booster air pressure of locomotive?
36. What is computer controlled braking, explain it with block diagram.
37. What is computer controlled braking, what are the various positions in which brakes can be applied through computer control brake system.
38. What are the various faults generated in computer controlled brake system which can be rectified by the driver during locomotive operation.
39. What are the various valves which are provided in computer control system discuss about periodicity of overhauling for some valves.
40. What are the advantages of computer control brake system over conventional system?
41. What is air compressor explain construction and working of air compressor provided on locomotive.
42. What are the various reasons of high Lube oil consumption in air compressor fitted on locomotives?
43. What is intercooler? where it is provided in case of a compressor what items should be checked in case of continuous blowing of intercooler safety valve
44. Explain the procedure of replacement of valves provided on compressor. What is the periodicity for change of compressor valves in case of Alco locomotive?
45. What is loading unloading in case of compressor, how loading unloading is achieved in Alco locomotive.
46. What is air dryer? What is the advantage of using dry air in locomotive brake system?
47. Explain the constructional detail of air dryer fitted on Alco locomotive.
48. What is the role of fuel system in Alco locomotive explain the working of fuel system with neat diagram.
49. What is the role of fuel oil system in GM locomotive explain the working of fuel system with neat diagram.
50. What are the various reasons of low fuel oil pressure in Alco locomotive?
51. What are the various reasons of low fuel oil pressure in GM locomotive?
52. What are the various components of fuel oil system what are the defects related to these components.
53. What are the various defects of fuel injector fitted on Alco locomotives?
54. What is fuel injection pump where it is fitted how it gets drive explain the overhauling procedure of fuel injection pump.
55. What are the preventive measures being followed to avoid fuel oil system related failures on locomotive.
56. What are the various reasons of mixing of fuel oil in Lube oil what prevention should be taken to avoid the same.

57. What are the reason of mixing of water in fuel system what preventive steps should be taken to avoid the same.
58. What is specific fuel consumption? What are the various maintenance factors which affect the specific fuel consumption?
59. What are the defects of fuel oil system in locomotive?
60. What is the function of fuel relief and regulating valve in locomotive fuel system? Explain overhauling and testing procedure of relief and regulating valve.
61. Explain construction and working of fuel relief valve fitted on Alco locomotive.
62. Explain construction and working of fuel and regulating valve fitted on Alco locomotive.
63. What are the properties of fuel oil? What are the various tests being carried out on fuel oil before fuelling in locomotive?
64. What is an air compressor? Explain the working of reciprocating type air compressor.
65. What are the various parts of compressor used on Alco locomotive?
66. Explain the overhauling procedure of compressor during periodic overhauling. What are the various parameters checked during assembly of compressor components.
67. What is Turbo and down test? Explain the procedure of conducting Turbo run down test what is the value of Turbo and down time for Major type of supercharger.
68. Compare the fuel injection system of Alco and GM locomotives.
69. Explain about the constructional details of fuel tank and what are the items to be checked during POH related to fuel tank.
70. What is power pack? Explain the dismantling procedure of power pack during periodic overhauling.
71. What are the major dimensions which are to be checked before assembly of power pack components?
72. What is fuel efficiency kit for what are the components which consists of fuel efficiency kit?
73. What are the advantages of providing fuel efficiency kit on locomotive what are the major constituents of fuel efficiency kits.
74. Explain the overhauling procedure of inlet and exhaust valve used for compressor.
75. Explain the overhauling procedure of fuel injector used in Alco locomotives.
76. What is mechanical unit injector explain the overhauling procedure of mechanical unit. Injector. What are the parameters which are to be checked after overhauling of mechanical unit injector?
77. What are the various locations which are prone to fuel leak ages in Alco locomotive and what are the preventive steps to be taken by maintenance staff.
78. What are the various locations which are prone to fuel leakage in GM locomotive and what are the preventive steps to be taken by maintenance staff.
79. What is load regulation percentage how it depends on fuel oil pressure of GM locomotive?
80. What are the various seasons of drop in load regulation percentage? What steps to be taken for rectification of the same?
81. What is an expressor? Where it is used in Indian Railway. Describe the constructional details of an expressor.
82. What are the various defect of expressor unit provided on locomotives?
83. What is air dryer what are the problems related to functioning of air dryer. How air dryer is bypassed in case of failure.
84. What is valve timing how it affects the power output of and engine? How valve timing is set on Alco locomotive.
85. What is firing order? What is its importance? What is the firing order of Alco locomotive?

86. What is firing order? What is its importance? What is a firing order of the GM locomotive how it can be checked by maintenance staff that power assemblies are firing in the exact sequence?
87. What are the various areas which are prone to water leakages in power pack? What preventive steps are to be taken by maintenance units to avoid such leakages?
88. What is crankcase vacuum? How it is achieved in Alco locomotive what are the reasons of crankcase vacuum drop in Alco locomotive.
89. What is crankcase vacuum? How it is maintained in the GM locomotive. Which unit is provided in GM locomotive for creation of crankcase vacuum? What are the reasons due to which crankcase vacuum may get dropped in GM locomotives.
90. Explain the procedure of replacement of power assembly in GM locomotive what fixtures required for replacement work.
91. Explain the procedure of replacement of fuel injection pump in Alco locomotive how the lift of fuel injection pump is adjusted in Alco locomotive.
92. What is tappet clearance? What is the standard value of tappet clearance in Alco locomotive how tappet clearance is it adjusted.
93. What are the areas which are affected due to thermal stress of engine block? What are the measures to be taken to avoid thermal stress in Alco locomotive?
94. What are the various reasons of failure of turbo supercharger? Which components or assemblies are more likely of failures due to excessive heat generated by engine block?
95. What is free end and power take off end in engine block which assemblies are provided at these ends, explain their functioning in brief.
96. What is a Governor what is its role in engine. How the RPM of engine is controlled by governor.
97. What is the method to check for or fuel internal leakages in GM locomotives what is the primary indication notice by maintenance staff in case of internal fuel leakage.
98. What are the reason of air mixing in fuel oil in GM locomotives at what location it is visible how it is rectified.
99. What type of filters is provided in fuel and system of GM locomotive what is its replacement periodicity. What are the defects related to fuel filters.
100. Which type of regulating are bypass valves provided in fuel system of GM locomotives? What is the standard procedure to be adopted for maintenance of the same?
101. What the reasons due to which fuel oil get are by passed and gets visible in fuel by pass sight glass in GM locomotive.
102. What is the construction of fuel pump? What are the reasons of failure of fuel pump in GM locomotive how the fuel oil pressure is checked by maintenance staff in case of GM locomotive.
103. What are the various routing components fitted engine block how lubrication of these components is provided.
104. What is sump examination, how it is carried out why it is important during the maintenance of power pack by maintenance staff.
105. What is blow by test how it is carried out what are the various reasons causing less blow-by pressure?
106. Explain the working of 4 stroke IC engine what is scavenging action.
107. Explain the working of 2 stroke IC engine, how the inlet air get inside the compression chamber as there are no inlet valves provided in GM locomotive.
108. What is a camshaft how it is driven what are the reasons of failure of camshaft gear how the lubrication of camshaft gear is achieved in Alco locomotive explain the procedure of replacement of CAM gear.

109. What is over speed trip assembly? Where it is located in locomotive. What is the working principle of over speed trip assembly?
110. Explain the construction of cylinder head. How cooling of cylinder head is achieved what are the locations through which the coolant water get out from the cylinder head.
111. What is holding down time test of cylinder head? Explain the procedure of conducting holding down time test at test bench during overhauling.
112. What is misfiring of injectors, how it is detected in case of GM locomotives.
113. What are the differences between the construction of power pack of GM locomotive and Alco locomotive.
114. Explain the procedure of replacement of camshaft bearing shell in GM locomotive.
115. Explain the procedure of replacement of unit injector in GM locomotive what precautions to be taken during treatment of unit injector where the free movement of fuel rack is checked in GM locomotives.
116. What is air compressor? At what locations the compressed air is used in a locomotive. How the moisture is removed from compressed air in locomotives.
117. How the fuel is passed from fuel header to injector in Alco locomotive, at which location copper washers are used in this process.
118. What is high pressure tube? Where it is provided. What are the steps to be taken to avoid failures of high pressure tube in Alco locomotives?
119. What is air brake self test how it is carried out in GM locomotives.
120. How the efficiency of MR tank is checked in GM locomotive explain the procedure.
121. How the loading unloading of compressor is done in case of GM locomotive. What is MVCC valve what is its role in operation of a compressor.
122. What is fuel return sight glass and fuel bypass site glass? Where these are mounted in GM locomotives, what is the cause of fuel droplets appearing in fuel bypass side glass?
123. Explain the procedure of Replacement fuel primary filter in GM locomotives. How the condition of fuel primary filter can be examined without opening the filter assembly by maintenance staff.
124. Explain the procedure of replacement of turbo supercharger in GM locomotives which components or assembly are required to be removed before replacement of the turbocharger.
125. What is overriding clutch? How the proper functioning of overriding clutch is examined in case of GM locomotive.
126. Explain the overhauling procedure of overriding clutch provided in GM locomotives. What is the periodicity of overhauling and what assemblies/spare are required during the overhauling.
127. Explain the constructional details of turbo supercharger provided in GM locomotives. What is a role of overriding clutch in functioning of the turbo supercharger provided in GM locomotives?
128. What are the various filters provided in fuel oil system of Alco locomotives? What is the periodicity of replacement of filter elements how the problem of low fuel pressure is rectified while working of locomotive.
129. What is hot oil detector? What is its working principle where it is provided in GM locomotives, how it prevents the excessive heating of lube oil.
130. What is engine protection device? Where it is located in GM locomotive in what conditions EPD gets operated.
131. What is adaptor assembly where it is provided in GM locomotives? On which principle it works what is its role in GM locomotives.
132. What are the various Lube oil pumps which are provided in GM locomotives?

133. What is pre lubrication how it is done for supercharger in GM locomotives explain the flow of lube oil from sump to Turbo supercharger during the pre-lubrication period.
134. What is pre-priming? When it is necessary to do pre-priming for engine block how it is done in GM locomotive.
135. What are the various properties of lube oil to be checked during routine maintenance of locomotive what is the limit of viscosity for safe starting of locomotive.
136. What is spectrographic test of lube oil? What are the various Test result which gives primary indication before failure of sub-assemblies.
137. What is hydraulic testing at which pressure hydraulic testing of engine block is carried out during POH of locomotives?
138. What are the various electronic card units with attitudes the computer control waiting provided in GM locomotives.
139. Explain the constructional details of cylinder liners provided on Alco locomotives what are the various reasons of excessive wear of liners during service period.
140. How the cooling of cylinder liner is done in GM locomotives explain the flow of coolant water from water header to cylinder head in GM locomotive passing through cylinder liner.
141. What are the various safety devices fitted on engine block of locomotive in what condition they gets operated and how they made the engine idle or shutdown condition for prevention of failure.
142. How the water internal leakage from liner is detected occurring in engine block of Alco locomotive what are the reasons for the same.
143. What are the reasons for excessive vibration of engine block what are the preventive steps for reducing the vibrations in Alco locomotives?
144. What is extension shaft gear? Where it is fitted in engine block what are the other auxiliary equipment which gets drive from extension shaft gear.