

## **Question Bank of Mechanical Engineering Objective Type Questions**

### **Part1 :**

#### **True or False Type Statements**

#### **Organisation of Mech. Engg. Deptt.**

1. The Mechanical Engineering Department employs 25% of the overall staff strength of Indian Railways.
2. RCF is situated in Patiala.
3. Repower-packing of Diesel Locos is carried out in DLW.
4. COFMOW deals with New Maintenance Practices for Workshops.
5. Diesel sheds are under the administrative control of CWE
6. ICF's staff strength is nearly double that of RCF although production levels are same.
7. CRSE stands for Chief Rolling Stock Engineer.
8. CMPE stands for Chief Manpower Planning Engineer.
9. Under the system of unified control, the WAO/SAO of a workshop reports to the CWM/DY.CME.
10. The post of Advisor (Mech.) in Railway Board has been re-designated as Additional Member (Mech.)
11. On Indian Railways we have mostly condition based prevention maintenance of our rolling stock.

#### **Locomotives**

1. A CO-CO type of locomotive would have 6 axles coupled together.
2. A CO-CO type of locomotive would have 8 wheels.
3. A BO-BO type of locomotive would have 4 axles individually driven.
4. The maximum power of WDM2 locomotive is 2100 HP.
5. The maximum power of WDS4 locomotive is 700 horse-power.
6. Sanding facility is provided in locomotives for reducing the friction between the wheel and the rail.
7. The Engine Repair Book is a necessary document for every individual loco.

8. One would find a washing line in a diesel loco shed.
9. We are importing 4000 hp diesel locos from Germany.
10. In a multiple Unit operation involving two diesel locomotives, both the locos have to be manned.
11. When diesel locos work in MU operation, only the leading loco is manned.
12. A pit-line occupation chart is prepared by diesel sheds.
13. The maximum usable tractive effort of a locomotive is limited by the adhesion.
14. The radiator fan of a WDM2 locomotive is situated in the long hood.
15. Our diesel locos have both types of traction motors - AC and DC.
16. The WDM2 locomotive has an electrical transmission system.
17. The WDS6 locomotive has a hydraulic transmission system.
18. Diesel Locos are provided with an Expressor to compress air before input into engine for combustion.
19. Diesel Locos are provided with an Expressor to create vacuum for train brakes and compressed air for loco brakes.
20. Diesel Locos are provided with a Turbo-charger to compress air before input into engine for combustion by utilising exhaust gas heat.
21. Throttle of a Diesel loco controls the engine RPM
22. Lube oil consumption of locos is monitored as a percentage of the fuel oil consumption.
23. In case the speed of locomotive exceeds the specified limit, its power get tripped by 'Overspeed trip mechanism'
24. In case the speed of diesel engine exceeds the specified limit, its power get tripped by 'Overspeed trip mechanism'
25. Diesel locos are not capable of hauling heavy trains, so Electrification is must.
26. Governor of a Diesel loco controls the opening & closing of contactors in Control Circuit.
27. Governor of a Diesel loco regulates the fuel supply to match the engine RPM and power requirement.
28. Three yearly schedule or IOH of Diesel locos is carried out in Workshops. Flasher light is provided on locomotives as a warning signal.
29. The 8th notch throttle position in a WDM2 locomotive gives the maximum power output
30. WDM2 bogies are manufactured by casting.

31. ZDM3 locomotive has an electrical transmission system.

32. The useful life of a Diesel loco is 36 years.

## **Coaches**

1. Coaches of super fast trains have been provided with CBC coupler.
2. If a coach is numbered SR 5622 Y, it would have a 24 volt system of train lighting.
3. The Target for ineffectiveness of Non- AC coaching stock is 10%
4. Present design of coaches are called Integral because the entire structure is welded in the form of a tube.
5. Coach body is made of Aluminum.
6. The function of a dashpot/shock absorber is to damp the oscillations of the springs
7. The Axle box springs in a coach are part of the secondary suspension system.
8. In coaches we have adopted solid wheels in place of tyred wheels.
9. Coaches built presently are telescopic in design.
10. Rake links are prepared for locos hauling mail/express passenger trains.
11. Periodic overhaul of coaches is carried out by coaching depots.
12. Periodicity of POH of Mail/ Express coaches is 18 months.
13. Ineffectiveness of AC coaches is prescribed as 12.0 %.
14. Periodicity of POH of Rajdhani Coach is 18 months or 4 Lakhs Kms
15. According to current instructions, primary maintenance of rakes is not required if the round trip is less than 1000 Kms.
16. Secondary maintenance of rake is required irrespective of distance between starting & terminating stations.
17. New coaches are provided with roof mounted AC system.
18. Brake blocks of a coach are examined/ replaced during trip examination
19. Oil level in side bearers & dash pot of ICF Coaches is checked during 'A' schedule.
20. Weight Transfer of ICF Coach takes place through centre Pivot.
21. Centre pivot of ICF Coach only acts as centering device & transmits tractive /braking force.

22. Damping in Primary suspension of an ICF Coach is by means of a shock absorber.
23. Damping in Primary suspension of an ICF Coach is by means of a oil filled dash-pot.
24. Damping in Secondary suspension of an ICF Coach is by means of a shock absorber.
25. Damping in Secondary suspension of an ICF Coach is by means of an oil filled dash-pot.
26. Side bearers of ICF coaches are provided with rubber pads to damp the forces.
27. ICF Bogies are manufactured by Fabrication.
28. ICF bogies are manufactured by casting.
29. The ICF coaches are provided with corrugated flooring
30. ICF Coaches are provided with compression tubes near head stock which can collapse in case of collisions after absorbing considerable shock energy.
31. Periodicity of 'B' schedule for a coach is 6 months
32. Periodicity of 'C' schedule for a coach is 6 months.
33. WACCN is a vestibuled AC 3 Tier coach.
34. SLR is a coaching vehicle in which symbol R indicates that it has a brake van.
35. The Codal life of an ICF coach is 30 years.

## **Wagons**

1. ROH of wagons is done in wagon repair workshops.
2. KC is a 4 - wheeler covered wagon.
3. BOXN wagons have laminated bearing springs.
4. TP & TK are 8 wheeler tank wagons.
5. CRT is a 4- wheeler tank wagon.
6. The BOY wagon is an air braked wagon
7. The BOX wagon is an air braked wagon.
8. The BOBR wagon is an air braked wagon.
9. BOX wagon are provided with fabricated UIC bogies
10. BCX is a bogie type covered wagon for carrying 'Explosives'.
11. The UIC bogie is a fabricated bogie.

12. The CASNUB Bogie is a fabricated bogie
13. A wagon of Western Railway can be given POH by any wagon repair workshop on Indian Railways.
14. Wagon having screw coupling do not have buffers.
15. Buffers are provided on wagons having CBC.
16. POH of BCNA wagons is done at intervals of 6 years
17. First POH of BOXN wagons is done after 6 years.
18. ROH of wagons is done at intervals of 36 months.
19. Maximum ineffectiveness prescribed for wagon stock is 6%.
20. Repacking of Plain bearing stock is required to be done every 6 monthly
21. Feeling of axle boxes to detect warm/ hot boxes is mandatory during 'outgoing' examination.
22. The codal life of a general purpose wagon is 30 years.

## **Components**

1. Tyres are fitted on wheel centres by shrink fit process.
2. WAP, Bangalore manufactures wheels by the process of forging.
3. Axles for wagons made by casting process in wheel & Axle Plant.
4. If a collar is provided at the end of an axle, it indicates that it is plain bearing axle.
5. Roller bearing axle do not have collars at the end.
6. Plain bearing are lubricated by grease
7. Roller bearing are lubricated by grease
8. Distance between two outer surfaces of wheels is known as Wheel Gauge
9. Ringing sound produced on tapping of wheel by hammer, indicates good tyre.
10. Brake Blocks are made of mild steel.
11. Workshops are generally provided with under floor wheel lathes.
12. Helical springs are also called Coil springs.
13. On Indian Railways preventive maintenance of rolling stock is condition based.

## **Brake System**

1. We are having a twin pipe system of working on our air braked freight trains.

2. The pressure of air in the brake pipe of air brake system is 5 Kg/Cm<sup>2</sup>.
3. The pressure of air in the feed pipe of air brake system is 5 Kg/Cm<sup>2</sup>.
4. During emergency braking the maximum air pressure in brake cylinder is 5 Kg/ Cm.sq.
5. Air Flow indicator is provided on each coach to find out from which coach Alarm Chain has been pulled.
6. In case of train parting, the brakes get applied automatically.
7. DA Valves are provided in coaches for expediting brake application.
8. The weight of brake equipments on a wagon are nearly same for air brake and vacuum brake systems.
9. Train speeds could be increased by introduction of air brakes.
10. Brake fading is experienced with vacuum brake system on sustained up gradients.
11. Empty load device is provided only on air braked wagons.
12. Slack Adjusters are provided only on coaching stock for maintaining the gap between the wheel tread and the brake block.
13. The Empty Load Device is provided in Wagons as well as Coaches.
14. Quick Release Valve is provided in coaches as well as wagons for expediting release of brakes in vacuum brake system.
15. Simultaneous application of brakes on trains and loco can be done by application of SA-9 handle of WDM2 loco.
16. Dynamic Braking in diesel locos becomes quite ineffective at low speeds.
17. Diesel Hydraulic locos cannot be provided with Dynamic brakes.
18. Slack Adjusters are provided only on coaching stock for maintaining the gap between the wheel tread and the brake block.
19. Minimum 85% effective brake power is required for giving fitness certificate to a goods train.

## **Train Dynamics**

1. Due to air resistance, the resistance to the motion of a train is proportional to the square  
of the velocity of the train
2. If Tractive Effort is less than Adhesion, the wheels will start slipping.

3. The balancing speed of a WDM2 locomotive on a tangent level track with a load of 4700 tons is 59 Km. per hour.
4. The force exerted by locomotive at Rail Wheel contact is called Adhesion.
5. The resistance offered by a bearing will always be higher during the starting of a train than during run.
6. The resistance offered by a bearing during the running of a train remains almost constant irrespective of the train speed.
7. As the speed of the locomotive increases , it develops higher tractive effort.
8. The speed at which Tractive effort developed by the loco equals the Train Resistance is called Balancing Speed.
9. The resistance of a BOXN wagon train will be higher than that of a 4-wheeler train if all other parameters such as speed, load, section etc. are same.
- 10.The resistance of a BOXN wagon train will be higher than that of a coaching train (with ICF coaches) if all other parameters such as speed, load, section etc. are same.**Diesel Break Down Cranes**
- 11.The maximum capacity of Steam break down cranes on Indian Railways is 75 tons.
- 12.The capacity of diesel break- down cranes provided on Indian Railways is 200 tons.
- 13.The maximum time allowed for dispatch of ART crane during day time is 30 minutes.
- 14.A Diesel brake down crane is likely to get toppled, if it is swiveled with full load without propping up.
- 15..Maximum counterweight provided on Diesel break down crane is 28 tons.
- 16.Match wagon of a Diesel Brake down is to be detached from main carriage during crane operation.
- 17.The Two designs of diesel cranes used on Indian Railways are of Gottwald and Karl Schank.

## Part II

**Multiple-choice Questions. Pick out the correct answer. More than one answer may be correct.**

### Organisational Structure & Prod. Units

1. IRCAMTECH deals with a) Research on maintenance practices of Railway equipments b) Rehabilitation of diesel locos c) Modernization of rolling stock d) Specifications and procurement of machines
2. COFMOW deals with a) Research on maintenance practices of Railway equipments b) Rehabilitation of diesel locos c) Modernization of rolling stock d) Specifications and procurement of machines
3. COFMOW is located in a) Bangalore b) Calcutta c) New Delhi d) Secunderabad
4. IRCAMTECH is located in a) Bangalore b) Calcutta c) New Delhi d) Gwalior
5. The population of diesel locos on Indian Railways is around a) 3400 b) 4300 c) 5600 d) 7000
6. The production capacity of DLW is \_\_\_\_ locos/year a) 135 b) 150 c) 165 d) 190
7. ICF and RCF have a combined production capacity of a) 500 coaches per year b) 1000 coaches per year c) 2000 coaches per year d) 5000 coaches per year
8. Pick out the odd designation a) EDME b) MM c) JDME d) CME
9. Pick out the odd designation a) EDME b) CRSE c) CMPE d) CWE

### Locomotives

1. The WDM2 engine has \_\_\_\_ cylinders a) 8 b) 12 c) 16 d) 24
2. In Diesel loco, engine RPM and power output is varied by a) Reversor handle b) A-9 c) SA-9 d) Throttle
3. Which of the following information is available in the diagram book of a diesel locomotive ? a) The sheds homing such locomotives b) The performance characteristics c) The load hauling capacity d) Equivalent horsepower electric locomotives

4. The engine of diesel locos is supposed to be shut down if the expected detention is more than a) 10 minutes b) 30 minutes c) 1 hour d) 4 hours
5. The target for Lube oil consumption of a diesel loco as a % of the Fuel oil consumption is a) 0.5 b) 1.0 c) 1.5 d) 2.0
6. Consumption of Fuel oil by individual locos is monitored by diesel sheds in a) Kilo-Litres per year b) Tonnes per year c) Litres per hour d) Liters per 1000 GTKM
7. Traction Motors used on our diesel locos are a) DC Motors b) AC Induction motors c) AC/DC motors d) Squirrel cage motors
8. The WDS4 is a a) an electric loco working on DC traction b) a diesel loco working slow trains c) a diesel main line loco d) a diesel shunting loco
9. Which of the following schedules would be done in the Running Repair section of a diesel shed a) Trip Schedule b) Monthly schedule c) Quarterly schedule d) Yearly schedule
10. The 4000 hp diesel locos are to be imported shortly from a) LHB, Germany b) Mak, Germany c) General Motors, USA d) General Electric, USA
11. Find the odd term out of the following a) Radiator fan b) Fire box c) Hot engine alarm d) Over speed trip mechanism
12. The target for Lube oil consumption of a diesel loco in Liters per 100 Engine Kms. is a) 1.5 b) 4.5 c) 6 d) 10
13. The horse power of a WDM2 locomotive is a) 800 b) 1380 c) 2600 d) 3100
14. The target for ineffectiveness for diesel loco is \_\_\_\_\_ a) 10% b) 12.5% c) 15% d) 19%
15. The horse -power of a WDP1 of a locomotive is \_\_\_\_\_ a) 800 b) 1380 c) 2300 d) 3100
16. The horse -power of a WDG2 of a locomotive is \_\_\_\_\_ a) 800 b) 1380 c) 2300 d) 3100
17. Which part of the locomotive regulates fuel input as per generator demand & Engine RPM a) Turbo charges b) Expressor c) Governor d) Throttle
18. The WDM2 is a a) Diesel locomotive for mail express train b) Diesel shunting locomotive c) Diesel locomotive for both passenger & goods operation d) Diesel loco for only goods operation
19. Maximum speed of the diesel engine of WDM2 Loco is at a) 8th notch b) 10th notch c) 15th notch d) 20th notch

20. The fuel consumed by a WDM2 Loco at 8th notch under full load is a) 100- 120 litres/hour b) 200- 250 litres/hour c) 400- 450 litres/hour d) 500- 550 litres/hour
21. The fuel consumed by a WDM2 Loco under idle condition is a) 10- 15 litres/hour b) 20- 25 litres/hour c) 30- 35 litres/hour d) 45-50 litres/hour

### **Coaching Stock**

1. The code of AC 3 Tier coach is a) ACCW b) ACCN c) AC3T d) ACTT
2. The codal life of an ICF coach is a) 20 years b) 30 years c) 45 years d) 25 years
3. The code of a sleeper class Coach is a) ACCW b) ACCN c) GSCNY d) FCS
4. The Code of a 2 Tier AC Coach is a) ACCW b) ACCN c) GSCNY d) AC2T
5. Type of Couplers used in superfast coaches are a) IR-20 b) Screw coupling c) CBC d) UIC
6. The POH of mail/express coaches is done at a periodicity of a) 18 months b) 3 years c) 12 months d) 6 years
7. For working out the requirement of coaches at various depots, what allowance is kept over the bare requirement as spare coaches a) 10% b) 12% c) 16% d) 20%
8. Which design feature in a coach makes it safer for passengers in case of a collision a) provision of roof mounted AC system b) Anti-telescopic feature c) feature of providing air brakes d) all coil suspension feature
9. The suspension arrangement in the present design of ICF coaches is a) single stage suspension with coil springs b) Single stage suspension with laminated bearing springs c) Double stage suspension with LB springs d) Two stage suspension with helical springs
10. The POH of Shatabdi coaches is done at a periodicity of a) 18 months b) 3 years c) 12 months d) 6 years
11. The Dash-pots are provided in ICF coaches for damping in----- ( Primary Suspension/ Secondary/ both)
12. In ICF Coaches, rubber pads are provided in----- to absorb vibrations a) Primary suspension b) Secondary suspension c) Both d) None

13. Corrugated Section is provided on the trough floor of ICF coaches to a) enhance strength b) for retaining timber pieces provided on the flooring c) for preventing slipping of passengers
14. The passage from one coach to another in a running train is provided by a) Stanchions b) Dampers c) CASNUB d) Vestibules

## Wagons

1. The cost of a BOXN wagon is around a) Rs. 10 lakhs b) Rs. 15 lakhs c) Rs. 20 lakhs d) Rs. 25 lakhs
2. Which type of bogie is used in BOXN wagons ? a) CASNUB b) IR 20 c) BO-BO d) UIC
3. BKH wagon is a) 4 wheeler vacuum braked wagon b) 8 wheeler air braked wagon c) 8 wheeler vacuum braked wagon d) 4 wheeler air braked wagon
4. Hand brakes are provided in a) 4 wheeler wagons b) 8 wheeler wagons c) AC coaches d) Non AC coaches
5. Which type of coupler is used in BOXN wagons ? a) CASNUB b) Screw coupling c) CBC d) UIC
6. BOX wagon is a) 4 wheeler vacuum braked wagon b) 8 wheeler air braked wagon c) 8 wheeler vacuum braked wagon d) 4 wheeler air braked wagon
7. BOBR wagon is a) 4 wheeler vacuum braked wagon b) 8 wheeler air braked wagon c) 8 wheeler vacuum braked wagon d) 4 wheeler air braked wagon
8. The target ineffectiveness for wagon stock is a) 4% b) 6% c) 10% d) 12.5%
9. Which of the following features are not present in a BCNA Wagon a) Air Brake b) CASNUB Bogie c) Cylindrical Roller Bearing d) Helical Spring
10. Which of the following features are not present in a BOX Wagon a) Vacuum brake b) UIC Bogie c) Cylindrical Roller Bearing d) Helical Spring
11. Which of the following features are not present in a BOXN Wagon a) Air Brake b) CASNUB Bogie c) Covered wagon d) Cartridge Roller Bearing
12. BOXN Wagon has -----advantage over a BOX Wagon a) More no. of wagons can be accommodated in a rake b) requires less maintenance c) permits higher speed of trains d) all the above

## Safety Components

1. A roller bearing may fail prematurely because of following reasons a) ingress of dust during examination b) overfilling of grease c) deterioration in grease condition d) lack of earthing during welding in sick line e) All the above reasons
2. Axle Box Roller Bearings are lubricated by a) Oil b) Grease c) None d) Both oil and grease
3. The Working range of enhanced screw coupling is \_\_\_\_\_ tons .( 22/30/36/60/80 ).
4. Buffing gear is provided to a) Save the car body from damage from braking forces b) Transmit tractive effort c) Joining two cars
5. A wagon with transition coupling is one having a) CBC with Knuckle b) CBC with Knuckle & two buffers c) CBC with baby coupling & two buffers d) Screw coupling with buffers
6. Which of the following is not a defect of CBC a) defective locking device b) worn out knuckle c) Homed buffer
7. Which of the following is not a part of suspension system a) Spring b) Centre pivot c) Shock absorber d) Swing link e) None of the above
8. Modern Rolling Stocks prefer Coil Spring over Laminated Spring because Laminated spring a) do not have linear load- deflection characteristics b) do not have self-damping characteristics c) are not reliable in Service
9. One disadvantage of a Coil Spring over Laminated spring is a) Non-linear load-deflection characteristics b) poor Self Damping property c) Lack of Centering characteristic d) Unreliability in Service

## Brake Systems

1. DA valve is now provided in all vacuum braked----- (Wagons / Coaches/ Locos/ all )
2. The phenomenon of brake fading takes place a) In vacuum brakes on sustained up gradients b) In air brakes on sustained down gradients c) In air brakes after 1000 Kms. Run d) In vacuum brakes on sustained down gradients

3. Incorrect position of Empty- load Box Device can result in a) Poor utilisation of wagon space b) Skidding of wheels c) Poor brake power d) Either (a) or (b) e) Either (b) or (c) f) All of (a), (b) & (c)
4. In vacuum brake cylinder, the piston comes to release position due to a) spring pressure b) Air pressure c) Its own weight d) All of the above
5. F type Vacuum brake is superior to traditional 'E' type since a) It uses release valve for fast release of brakes b) It has better rolling ring to reduce leakages c) Its upper chamber is connected to a large vacuum reservoir for increasing effective brake force. d) Its piston stroke is large to increase brake power
6. The Maximum brake cylinder pressure in air brake system is a) 6 kg/ cm.sq. b) 5kg/ cm.sq c) 3.5 kg/cm.sq d) 2.5 kg/ cm.sq
7. Which of the following is not a part of Single pipe Air Brake System a) Distributor valve b) Control reservoir c) Feed pipe d) Brake Cylinder
8. The basic purpose of DA valve is to a) Expedite brake application only b) Expedite brake release only c) Expedite both application & release d) None of the above
9. The basic purpose of Slack Adjuster is to a) take up slack due to wear & tear of bearing brass b) to maintain wheel gauge irrespective of wear of flange c) to maintain brake shoe- wheel clearance d) to maintain brake cylinder stroke
10. Empty load Box provided in BOX/ BOXN wagons alters brake force under loaded & empty condition by a) Altering mechanical advantage of brake rigging b) Altering brake cylinder pressure c) Altering piston stroke of brake cylinder d) Altering brake shoe to wheel clearance
11. In a long vacuum good train, the brake power of rear wagons can be lower than brake power of front wagons by a) 10 to 15% b) 15 to 25% c) 2 to 5% d) Almost Nil

## **Train Dynamics**

1. The balancing speed achieved by a locomotive depends on a) the horse power of the locomotive b) the tractive effort of the locomotive c) the type of bearings provided in the rolling stock being hauled d) all the above factors

2. The resistance to the motion of a train is proportional to
  - a) The tractive effort
  - b) The speed of the train
  - c) The horse power of the locomotive
  - d) The square of the velocity of the train
3. The coefficient of friction between wheel and rail is normally around
  - a) 0.1
  - b) 0.25
  - c) 0.40
  - d) 0.75
4. In the formula :Train Resistance =  $A + B v + C v^2$  ,A depends on
  - a) resistance in the bearings
  - b) resistance due to flange, swaying etc.
  - c) air resistance
5. In the formula :Train Resistance =  $A + B v + C v^2$  ,B depends on
  - a) resistance in the bearings
  - b) resistance due to flange, swaying etc.
  - c) air resistance .
6. In the formula :Train Resistance =  $A + B v + C v^2$  ,C depends on
  - a) resistance in the bearings
  - b) resistance due to flange, swaying etc.
  - c) air resistance
7. The starting resistance of a train depends upon
  - a) resistance in the bearings
  - b) resistance due to curves.
  - c) resistance due to grades
  - d) all the above
8. For obtaining a higher balancing speed we can
  - a) Use a higher horsepower locomotive
  - b) Use Roller Bearing stock in place of plain bearing
  - c) Improve the aerodynamic profile of the rolling stock
  - d) All the above factors.
9. The balancing speed of a WDM2 locomotive on a tangent level track with a load of 4700 tons is
  - a) 59 Km. per hour
  - b) 65 Km. per hour
  - c) 74 Km. per hour
  - d) 80 Km. per hour
10. The force exerted by locomotive at Rail Wheel contact is called
  - a) Adhesion
  - b) Tractive effort
  - c) Buffing force
  - d) Balancing force

## Part III

### Fill in the Blanks Type Questions

1. The WDS4 locomotives employ \_\_\_\_\_ transmission. (electric, Hydraulic)
2. In Diesel-Electric Locos fitted with Dynamic Brake, the Current generated is \_\_\_\_\_ (stored in the battery/ dissipated as heat in resistors).
3. The maintenance schedules for diesel locos are laid down on \_\_\_\_\_. ( Km basis /Time basis).
4. Compared to the IRS coach, the ICF coach is \_\_\_\_\_ ( heavier / lighter).
5. The difference between the tractive Effort of the Locomotives and the Train Resistance is the Force available for \_\_\_\_\_ ( accelerating / braking the train).
6. C.B.C. stands for \_\_\_\_\_
7. Wheel gauge is the distance between the \_\_\_\_\_ faces of the two wheels on the Axle. (inner / outer)
8. POH interval for coaches running on Mail / Express train is \_\_\_\_\_
9. Codal life of an ICF coach is \_\_\_\_\_ years.
10. Codal life of an IRS coach is \_\_\_\_\_ years.
11. Codal life of a tank wagon is \_\_\_\_\_ years.
12. Codal life of a BOXN wagon is \_\_\_\_\_ years.
13. The BOXN is \_\_\_\_\_ in length compared to a BOX wagon. ( longer / shorter)
14. In Diesel -Electric Locos fitted with Dynamic Brake, the current generated is \_\_\_\_\_ (Stored in the battery/ dissipated as heat in resistors).
15. In YDM 4 Loco, Y & M stands for \_\_\_\_\_ & \_\_\_\_\_ resp.
16. Code of an 8- wheeler tank wagon for liquefied Petroleum Gas is \_\_\_\_\_
17. Code of an 8- wheeler flat wagon for containers is \_\_\_\_\_
18. The equipment provided in BOX/ BOXN wagons to alter brake force under loaded & empty condition is called-----.
19. Full form of DA valve is \_\_\_\_\_

## Subjective Questions- Short Answer Type

### Briefly Answer following Questions.

1. Briefly show the Organisational chart of Mech. Engg. Deptt. In the Zonal Headquarter.
2. Briefly show the Organisational chart of Mech. Engg. Deptt. In the Railway Board.
3. Briefly show the Organisational chart of Mech. Engg. Deptt. In the Division..
4. What are the various duties of Chief Workshop Engineer
5. What are the various duties of Chief Mechanical Engineer (Planning).
6. What are the various duties of CMPE (Diesel)
7. Which department co-ordinates the M&P Programme and which agency deals with centralised procurement of M&P?
8. Name the major departments in a Workshop?
9. Briefly describe the difference in the wheel arrangements of CO-CO and B-B Bogies.
10. Briefly describe the difference in the wheel arrangements of WDM2 & WDS4 Locos.
11. Why it is necessary to have a transmission system in a diesel locomotive?
12. Name the different types of transmission systems used in a diesel locomotives.
13. Briefly describe the Electrical transmission System of a diesel loco.
14. Briefly describe the Hydraulic transmission System of a diesel loco.
15. What is the function of a turbo-charger in a Diesel locomotive?
16. Name any 5 major sub-assemblies of a Diesel Loco
17. Name any 5 safety fittings of a Diesel Loco
18. What is the frequency of maintenance of diesel locomotives under various maintenance schedules?
19. List some of the important records maintained in a Diesel Loco Shed.
20. What are the various features of an ICF coach which make it 'Anti-telescopic'?
21. What are Primary & Secondary Suspensions?
22. Briefly describe Primary suspension of an ICF coach.

23. Briefly describe Secondary suspension of an ICF coach.
24. What is the maximum ineffectiveness prescribed for the Non- AC coach?
25. What arrangements have been made in ICF coaches for damping Primary & Secondary suspensions?
26. What are the various schedules for maintenance for a main line passenger coach?
27. Briefly list the various items which are attended, examined during 'A' schedule of a coach
28. Briefly list the various items which are attended, examined during 'B' schedule of a coach
29. Briefly list the various items which are attended, examined during 'C' schedule of a coach
30. What are PRO particulars for a 4-wheeler wagon and what type of wagon is CRT ?
31. What are the advantages of BOXN wagon over BOX wagon?
32. What items are attended during rolling-in examination of a goods train.
33. What items are attended during terminating examination of a goods train
34. What items are attended during out going examination of a goods train
35. Explain briefly the difference between safe to run examination and intensive examination.
36. How the ineffectiveness of Rolling stock is calculated? What is the maximum ineffectiveness prescribed for the wagon stock?
37. What are the advantages of Roller Bearing Stock over plain bearing stock ?
38. How is a wheel tyre fitted over a wheel centre?
39. Why Helical Springs are preferred over Laminated Springs in Modern Rolling Stocks ?
40. What are the advantages of CBC coupler over Screw Type coupler?
41. Draw a sketch of a typical Wheel profile and indicate its root, flange and tread.
42. List various defects of a Wheel Assembly.
43. List various defects of a Suspension System
44. List various defects of a Coupling System.
45. What is the Function of an Empty load Box Device and how does it work?
46. What happens when Alarm Chain is pulled in a vacuum Braked passenger Coach?

47. Name major components of a vacuum brake system.
48. Name major components of an air brake system.
49. Mention any 3 advantages of Air brake over Vacuum brake.
50. What are the various factors which determine the starting resistance of a train?
51. What are the various factors which determine the rolling resistance of a train?
52. What is Adhesion and what are the factors which affect it?
53. What do you understand by Balancing Speed?
54. What are the various factors which determine that how much trailing load can be attached to a locomotive.
55. Name the 2 parameters which determine the starting tractive effort of locomotive.
56. Name the various parameters which determine the safe lifting load of a crane.
57. Why a match wagon has been provided in 140 ton Diesel Breakdown crane?
58. What is the purpose of outriggers provided in a 140 ton diesel breakdown crane?

### **Descriptive Questions**

#### **Organisation**

1. What are the functions of the Mechanical Department? What is the organization of the Mechanical Department in Railway Board?
2. What is organization of the Mechanical Department at Zonal headquarters? Explain the duties of the Mechanical HODs.
3. Write short note on any two of the following:
  - a. DLW
  - b. CLW
  - c. ICF
  - d. DRCF

#### **Diesel**

1. What are the various maintenance Schedules of a Diesel Locomotive (WDM2)?
2. Name 3 new technologies being developed by Indian Railways for rolling stock and their operation.
3. What are the roles of Chief Workshop Engineer and Chief Motive Power Engineer (Diesel)?
4. Why it is necessary to have a transmission system in a diesel locomotive? What do you understand by balancing speed?
5. Write short note on Tractive effort.
6. Write short note on 140 ton diesel brake down crane.

7. What are the various parts of a WDM2 locomotive? What are the differences between WDM2 and WDG3A?

### Coaching

1. What are the various maintenance schedules carried out in the coaches? What are the items attended during Primary examination?
2. List the various items attended during the primary/ secondary maintenance of a coach.
3. Describe what checks are carried out during rolling in/ rolling out examination of a coaching train?
4. What are the various schedules carried out in the coaches? List various items which are attended, examined during the A schedule of a coach.
5. What are the items carried out during POH of a coach?
6. Please indicate advantages of LHB coaches over ICF coaches in terms of Design/speed/Ride quality.
7. On an 18 coach train with coach mounted brake cylinder, 4 brake cylinders are inoperative. Calculate brake power percentage of this train.
8. Describe the main parts of ICF bogies.
9. What is a fail safe brake. How is it achieved on air brake systems?
10. Briefly list the various types of repair schedules of a coach?
11. Write 8 components of twin pipe air brake system of a coach.
12. Write short note on ICF bogie.
13. Please indicate three characteristics of ICF coaches which are not present in IRS coaches.
14. What are the features of an IRS coach? What is the advantage of an ICF coach over IRS coach?
15. Explain the various parts of the underframe and super structure of a coach.
16. Why ICF coach is called integral design coach? Describe the various parts of an ICF coach? How the weight transfer takes place in an ICF coach?
17. What are the salient features of an LHB coach?

### **Wagons**

1. Describe various items attended during rolling-in examination and terminating examination of a goods train.

2. What are the requirements for running a goods train in closed air rake? How is it different from premium rake examination. Explain the difference between the closed rake circuit rake examination and premium rake examination.
3. What are the differences between End to end examination, closed circuit rake examination and premium rake examination?
4. Explain Closed circuit and premium examination of wagons in brief.
5. Draw a wheel profile and indicate its root, flange and tread.
6. Explain Closed circuit and end to end examination of wagons in brief.
7. What are the differences between CRT, BOX and BOXN wagon?
8. Describe the Air brake system of an BOXN Wagon. What are the various parts? What are the advantages of air brake over vacuum brake system?

### **Workshop**

1. What are the sections under the control of a Production Engineer (P.E.) in a workshop? Explain in brief, the duties of various sections.
2. What is the typical organizational structure of a workshop? What is the role of a Production Engineer?
3. Briefly describe bathtub curve group replacement and its application to preventive maintenance schedule on Indian Railways?
4. Please explain the organization of a workshop.

### **Running**

1. What are the various rests which a Loco Pilot is entitled to?
2. What do you understand by a crew lobby? What records and registers are kept in the lobbies?
3. Explain the basis on which the crew links are made.
4. What precautions are taken by crew controller during signing on and signing off of a loco pilot? What registers are filled/ seen by a loco pilot during signing on and signing off?
5. Explain how a loco pilot is rated by a Loco Inspector? Also explain the duties of a Loco Inspector.
6. List out the equipments carried by a loco pilot in the locomotive.
7. What measures will you take to prevent drunkenness on duty of the running staff?



