

Question Bank

Class: TE Mechanical

Sub: I.C. Engines

1. In a petrol engine car which one of the following performance characteristics is affected by the front-end volatility of the gasoline used?
A) Hot starting and vapour lock
B) Engine warm-up and spark plug fouling
C) Spark plug fouling and hot starting
D) Vapour lock, engine warm-up and spark plug fouling
2. Quantity of air entering the cylinder remains unchanged in
A) Quantitative governing
B) Hit and miss governing
C) Qualitative governing
D) All of the above
3. In a 4-stroke engine power is produced
A) Once in every stroke of piston.
B) Once in one revolution of crank
C) Once in four revolutions of crank
D) Once in two revolution of crank
4. A 4 stroke, S.I. engine having bore of 7 cm & stroke 9 cm, develops a BP 20 kW at 3000 rpm. If clearance volume in each cycle is 50 cm^3 & the brake thermal efficiency is 50 percent and C.V. is 43 MJ/kg. Find out the brake thermal efficiency and torque
A) $\eta_{th} = 26.94$ percent & $T = 63.66 \text{ N-m}$
B) $\eta_{th} = 23.94$ percent & $T = 63.66 \text{ N-m}$
C) $\eta_{th} = 29.94$ percent & $T = 64.63 \text{ N-m}$
D) $\eta_{th} = 27.94$ percent & $T = 67.66 \text{ N-m}$
5. Which one of the following is independent of fuel constituents, combustion chamber design, temperature and pressure of compressed charge?
A) Detonation
B) Pinking
C) Pre-ignition
D) Knocking

6. The tendency of detonation in SI engine is reduced by increasing

- A) Compression ratio
- B) Intake pressure
- C) Intake temperature
- D) Engine speed

7. Highest useful compression ratio is indicator of

- A) detonation of a fuel at a particular temperature
- B) detonation of the fuel in a particular engine
- C) detonation of a fuel under specified conditions in a standard engine
- D) Knocking of a fuel at a particular pressure

8. The phenomenon that causes pressure waves resulting in vibration of structure, rough running and melting of piston is

- A) Knocking
- B) Pinking
- C) Pre-ignition
- D) Detonation

9. In a 4-stroke SI engine, the inlet and exhaust valves

- A) Remain open together for about 20° crank rotation
- B) Always open simultaneously
- C) Never open simultaneously
- D) Remain open together for about 40° crank rotation

10. The spark advance in SI engine is adjusted to obtain maximum pressure

- A) More than 12° after TDC
- B) at TDC
- C) $10-12^\circ$ before TDC
- D) $10-12^\circ$ past TDC

11. Maximum pressure at TDC will

- A) Avoid knocking
- B) Produce optimum power
- C) Reduce net work of engine
- D) Increase net work of engine

12. Ignition advance in S.I engine is not the direct function of

- A) Load on engine
- B) Grade of petrol
- C) Compression ratio
- D) Mixture strength

13. Delay period in CI engine compresses time for
- A) Supercharging
 - B) Design of combustion chamber
 - C) Injection pressure
 - D) Type of fuel
14. For the same power an engine produces maximum torque when
- A) Speed is maximum
 - B) Efficiency is maximum
 - C) Fuel consumption is maximum
 - D) Speed is minimum
15. Maximum temperature produced in an I.C engine cylinder ranges between
- A) 2500°C-3000°C
 - B) 1000°C-1500°C
 - C) 2000°C-2500°C
 - D) 1500°C-2000°C
16. An engine develops 28 KW of B.P and 35KW of I.P. The relative efficiency is 50 percent. The engine works on Otto cycle with compression ratio of 6. The indicated thermal efficiency of the engine is closest to
- A) 26 percent
 - B) 13 percent
 - C) 16 percent
 - D) 32 percent
17. The compression ratio in a diesel engine is generally in the range of
- A) 14:22
 - B) 22:25
 - C) 25:30
 - D) more than 30
18. Though governing does not smoothen the turning moment, one of the governing methods may be the reason of unevenness in turning moment. Which one is that?
- A) Quantitative governing
 - B) Hit and miss governing
 - C) Qualitative governing
 - D) Any type of governing

19. A 4-stroke engine develops indicated power of 325 kW at 2500 rpm. If mech. efficiency is 80%, the torque at crank is

- A) 104 N-m
- B) 993 N-m
- C) 624 N-m
- D) 500 N-m

20. In some diesel engines arrangement is incorporated to increase compression ratio at starting to compensate for

- A) Lower temperature at inlet
- B) Reduced air intake at start
- C) Leakage across piston rings
- D) Pressure loss at intake

21. Fuel injection in a medium speed, 4-stroke diesel engine

- A) Begins 10° before TDC and ends 20° after TDC
- B) Begin 15° after TDC and ends 15° after TDC
- C) Begins 5° before TDC and ends 20° after TDC
- D) Begins at TDC and ends 20° after TDC

22. Expansion in a medium speed, 4-stroke diesel engine

- A) Begins 20° after TDC and ends 35° before BDC
- B) Begins 5° after TDC and ends 40° before BDC
- C) Begins 15° after TDC and ends 30° before BDC
- D) Begins 10° after TDC and ends 35° before BDC

23. Exhaust valve of medium speed 4-stroke diesel engine will open

- A) 40° before BDC and close 15° after TDC
- B) 35° before BDC and close 20° after TDC
- C) 25° before BDC and close 30° after TDC
- D) 30° before BDC and close 25° after TDC

24. Which of the following statements is "true"?

A) The term "KNOCK" is used for an identical phenomenon in a spark ignition and compression ignition engine.

B) "KNOCK" is a term associated with a phenomenon taking place in the early part of combustion in a compression ignition engine and the later part of combustion in a spark ignition engine.

C) "KNOCK" is a term associated with a phenomenon taking place in the early part of combustion in a spark ignition engine and the later part of combustion in a compression ignition engine.

D) None of the above.

25. The essential function of the Carburettor in a spark ignition engine is to:

A) Meter the fuel into air stream and amount dictated by the load and speed

B) Bring about mixing of air and fuel to get a homogeneous mixture

C) Vaporize the fuel

D) Distribute fuel uniformly to air cylinders in a multicylinder engine and also vaporize it

26. Assertion (A): Air standard efficiency of thermodynamic cycles is higher than; actual efficiency of engines

Reason (R): Air is not a perfect gas.

A) A & R both are true & R explains A

B) A & R both are true but R does not explain A

C) A true & R false

D) A false & R true

27. For a constant maximum pressure and heat input, the air standard efficiency of gas power cycles is in the order

A) Diesel cycle, dual cycle, Otto cycle

B) Otto cycle, Diesel cycle, dual cycle

C) Dual cycle, Otto cycle, Diesel cycle

D) Diesel cycle, Otto cycle, dual cycle

28. Which of the following factors increase detonation in the SI engine?

1. Increase spark advance

2. Increased speed

3. Increased air-fuel ratio beyond Stoichiometric strength

4. Increased compression ratio

Select the correct answer using the codes given below:

A) 1 and 3

B) 2 and 4

- C) 1, 2 and 4
- D) 1 and 4

29. Besides mean effective pressure the data needed for determining the indicated power of an engine would include.

- A) piston diameter, length of stroke and calorific value of fuel
- B) piston diameter, specific fuel consumption and calorific value of fuel
- C) piston diameter, length of stroke and speed of rotation
- D) specific fuel consumption, speed of rotation and torque

30. Consider the following statements:

I. The performance of an S.I. engine can be improved by increasing the compression ratio

II. Fuels of higher octane number can be employed at higher compression ratio

Of these statements

- A) both I & II are true
- B) both I & II are false
- C) I is true but II is false
- D) I is false but II is true

31. Assertion (A): Self-ignition temperature of the end charge must be higher to prevent knocking of an SI engine, Reason (R): Higher compression ratio increases the temperature of the air-fuel mixture

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

32. Assertion (A): Air injection system finds wide application in modern diesel engines, Reason (R): Very good atomization of fuels is attained by the air injection system.

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

33. The object of providing masked inlet valve in the air passage of compression-ignition engines is to

- A) enhance flow rate
- B) Control air flow

- C) induce primary swirl
- D) induce secondary turbulence

34. Which one of the following events would reduce the volumetric efficiency of a vertical compression ignition engine?

- A) Inlet valve closing after bottom dead centre
- B) Inlet valve closing before bottom dead centre
- C) Inlet valve opening before top dead centre
- D) Exhaust valve closing after top dead center

35. As compared to air standard cycle, in actual working, the effect of variation in specific heats is to

- A) increase maximum pressure and maximum temperature
- B) reduce maximum pressure and maximum temperature
- C) increase maximum pressure and decrease maximum temperature
- D) Decrease maximum pressure and increase maximum temperature

36. Reference fuels for knock rating of SI engine fuels would include

- A) Iso-octane and alpha- methyl naphthalene
- B) Normal octane and aniline
- C) Iso-octane and n-hexane
- D) N-heptane and iso-octane

37. Generally in Bosch type fuel injection pumps, the quantity of fuel is increased or decreased with change in load, due to change in-

- A) timing of start of fuel injection
- B) timing of end fuel injection
- C) injection pressure of fuel
- D) velocity of flow of fuel

38. Which one of the following quantities is assumed constant for an internal combustion engine while estimating its friction power by extrapolation through William's line?

- A) Brake thermal efficiency
- B) Indicated thermal efficiency
- C) Mechanical efficiency
- D) Volumetric efficiency

39. A gas engine has a swept volume of 300 cc and clearance volume of 25 cc. Its volumetric efficiency is 0.88 and mechanical efficiency is 0.90. What is the volume of the mixture taken in per stroke?

- A) 248 cc
- B) 252 cc
- C) 264 cc
- D) 286 cc

40. Knocking in the SI engine decreases in which one of the following orders of combustion chamber designs?

- A) F head, L head I head
- B) T head, L head, F head
- C) I head T head. F head
- D) F head I head, T head

41. By higher octane number of SI fuel, it is meant that the fuel has

- A) higher hearing value
- B) higher flash point
- C) lower volatility
- D) longer ignition delay

42. Which of the following factors would increase the probability of knock in the CI engines?

1. Long ignition delay of fuel
2. Low self ignition temperature of fuel
3. Low volatility of fuel

Select the correct answer using the codes given below:

- A) 1, 2 and 3
- B) 1 and 2
- C) 1 and 3
- D) 2 and 3

43. Keeping other parameters constant brake power of diesel engine can be increased by

- A) decreasing the density of intake air
- B) increasing the temperature of intake air
- C) increasing the pressure of intake air
- D) decreasing the pressure of intake air.

44. Assertion (A): In SI engines as the engine speed increases, spark is required to be advanced.
Reason (R): As the engine speed increases, flame velocity increases

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

45. Assertion (A): A very high compression ratio is favored for a CI engine, in order to attain high mechanical efficiency without knocking Reason (R): The delay period in CI combustion affects rate of pressure rise and hence knocking.

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

46. Consider the following statements: Knock in the SI engine can be reduced by 1. Supercharging 2. retarding the spark 3. Using a fuel of long straight chain structure 4. increasing the engine speed. Of these statements

- A) 1 & 2 are correct
- B) 2 & 3 are correct
- C) 1, 3 & 4 are correct
- D) 2 & 4 are correct

47. Consider the following statements: The injector nozzle of a CI engine has required to inject fuel at a sufficiently high pressure in order to

1. be able to inject fuel in a chamber of very high pressure at the end of the compression stroke 2. inject fuel at high velocity to facilitate atomization 3. ensure that penetration is not high. Of the above statements

- A) 1 & 2 are correct
- B) 1 & 3 are correct
- C) 2 & 3 are correct
- D) 1, 2 & 3 are correct

48. Compensating jet in carburetor supplies almost constant amount of petrol at all speeds because

- A) the jet area is automatically varied depending on the suction
- B) the flow from the main jet is diverted to the compensating jet with increase in speed
- C) the diameter of the jet is constant and the discharge coefficient is invariant
- D) the flow is produced due to the static head in the float chamber

49. Which one of the following types of compressors is mostly used for supercharging of I.C engines?

- A) Radial flow compressor
- B) Axial flow compressor
- C) Roots blower
- D) Reciprocating compressor

50. A two stroke engine has a speed of 750 rpm, A four stroke engine having an identical cylinder size runs at 1500 rpm. The theoretical output of the two-stroke engine will

- A) be twice that of the four-stroke engine
- B) be half that of the four-stroke engine
- C) be the same as that of the four-stroke
- D) depend upon whether it is a C.I. or S.I engine

51. For same power output and same compression ratio, as compared to two-stroke engines, four stroke S.I engines have:

- A) higher fuel consumption
- B) lower thermal efficiency
- C) higher exhaust temperatures
- D) higher thermal efficiency

52. Consider the following statements: Detonation in the S.I engine can be suppressed by 1. retarding the spark timing 2. increasing the engine speed 3. using 10% rich mixture

- A) 1 and 3 are correct
- B) 2 and 3 are correct
- C) 1, 2 and 3 are correct
- D) 1 and 2 are correct

53. Consider the following statements:

1. Volumetric efficiency of diesel engines is higher than that of SI engines
2. When a SI engine is throttled; its mechanical efficiency decreases
3. Specific fuel consumption increases as the power capacity of the engine increases
4. In spite of higher compression ratios, the exhaust temperature in diesel engines is much lower than that in SI engines.

Choose correct sentences.

- A) 1, 2, 3 & 4 are correct
- B) 1, 2 & 3 are correct
- C) 1 & 4 are correct
- D) 1,2 & 4 are correct

54. Assertion (A): In practice, the efficiency of diesel engines is higher than that of petrol engines Reason (R): For the same compression ratio, the efficiency of diesel cycle is higher than that of Otto cycle.

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

55. Assertion (A): Pre-chamber diesel engines use higher injection pressures when compared to open combustion chamber engines Reason (R): Any pre-chamber engines have higher compression pressures

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

56. Assertion (A): One of the important requirements of carburetor is to supply lean mixture at starting. Reason (R): A rather lean mixture is required at No-load and Low-load operation of a SI engine.

- A) A-True R-False
- B) A-False R-True
- C) A-True R-True
- D) A-False R-False

57. Which of the following are the assumptions involved in the auto-ignition theory put forth for the onset of knock in SI engines?

1. Flame velocity is normal before the onset of auto ignition
2. A number of end-gas elements autogenetic simultaneously
3. Pre flame reactions are responsible for preparing the end-gas to ignite

Select the correct answer using the codes given below.

- A) 1 and 2
- B) 1 and 3
- C) 2 and 3

D) 1, 2 and 3

58. In some carburetors, meter rod and economizer device is used for

- A) cold starting
- B) idling
- C) power enrichment
- D) acceleration

59. Velocity of flame propagation in the SI engine is maximum for a fuel-air mixture which is

- A) 10% richer than Stoichiometric
- B) Equal to Stoichiometric
- C) More than 10% richer than Stoichiometric
- D) 10% leaner than Stoichiometric

60. Divided chamber diesel engines use lower injection pressures compared to open chamber engines because

- A) Pintle nozzles cannot withstand high injection pressure
- B) High air swirl does not require high injection pressures for atomization
- C) High injection pressures may cause over penetration
- D) High injection pressures causes leakage of the fuel at the pintle

61. In a variable speed S.I. Engine, the maximum torque occurs at the maximum

- A) Speed
- B) Brake power
- C) Indicated power
- D) Volumetric efficiency

62. Consider the following statements:

1. Octane rating of gasoline is based on iso-octane and n-heptane fuels which are paraffins
2. Tetraethyl lead is added to gasoline to increase octane number
3. Ethylene dibromide is added as scavenging agent to remote lead deposits on spark plugs.
4. Surface ignition need not necessarily cause knocking.

Which of these statements are correct?

- A) 1, 2, 3 and 4
- B) 2, 3 and 4

- C) 1 and 4
- D) 1, 2 and 3

63. Consider the following statements;

1. Recycling exhaust gases with intake increases emission of nitrogen oxide from the engine
2. When the carburetor throttle is suddenly opened, the fuel air mixture leans out temporarily causing engine stall.
3. The effect of increase in altitude on carburetor is to enrich the entire part-throttle operation
4. Use of multiple venturi system makes it possible to obtain a high velocity air stream when the fuel is introduced at the main venturi throat

Which of these statements are correct?

- A) 1 and 3
- B) 1 and 2
- C) 2 and 3
- D) 2 and 4

64. Consider the following statements:

In down draft carburetor, a hot spot is formed at the bottom wall which is common for intake and exhaust manifolds. This helps to

1. improve evaporation of liquid fuel
2. provide higher thermal efficiency
3. reduce fuel consumption
4. lower the exhaust gas temperature

Which of these statements are correct?

- A) 1, 2 and 4
- B) 1, 2 and 3
- C) 1, 3 and 4
- D) 2, 3 and 4

65. In a petrol engine car which one of the following performance characteristics is affected by the front- end volatility of the gasoline used?

- A) Hot starting and vapour lock
- B) Engine warm-up and spark plug fouling
- C) Spark plug fouling and hot starting
- D) Vapour lock, engine warm-up and spark plug fouling

66. Assertion (A): The CI engine is basically more suitable for supercharging than the SI engine
Reason (R): In the CI engine supercharging tends to prevent diesel knocking

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explain A
- C) A true & R false
- D) A false & R true

67. In the operation of four-stroke diesel engines, the term 'squish' refers to the

- A) injection of fuel in the combustion chamber
- B) discharge of gases from the pre- combustion chamber
- C) entry of air into the combustion chamber
- D) snapping of fuel from the core

68. Consider the following statements regarding the advantages of fuel injection over carburetion in S.I. engines:

- 1.Higher power output and increased volumetric efficiency
- 2.Simple and inexpensive injection equipment
- 3.Longer life of injection equipment
- 4.Less knocking and reduced tendency for back-fire.

Select the correct answer using the codes given below:

- A) 1, 2 and 3
- B) 1, 2 and 4
- C) 2 and 3
- D) 1 and 4

69. Assertion (A): Knocking in SI engine due to auto-ignition of the end charge while knocking in C.I. engines is due to auto-ignition of the first charge Reason (R): Spark Ignition engines employ lower compression ratio than diesel engines and the fuel used has a calorific value lower than that of diesel oil.

- A) A & R both are true & R explains A

- B) A & R both are true but R does not explains A
- C) A true & R false
- D) A false & R true

70. Assertion (A): The C.I. engine is found to be more efficient than an S.I. engine
Reason(R): Modern C.I. engine operate on a dual-cycle, which has an efficiency greater than the Otto cycle.

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explains A
- C) A true & R false
- D) A false & R true

71. Assertion (A): A pintle nozzle is employed to mix the fuel properly even with the slow air movement available with many open combustion chambers in C.I. engines. Reason (R): The mixing of fuel and air is greatly affected by the nature of the air movement in the combustion chamber of C.I. engines.

- A) A & R both are true & R explains A
- B) A & R both are true but R does not explains A
- C) A true & R false
- D) A false & R true

72. The ratio of indicated thermal efficiency to the corresponding air standard cycle efficiency is called

- A) net efficiency
- B) efficiency ratio
- C) relative efficiency
- D) overall efficiency

73. Compression ratio of I.C. engine is

- A) the ratio of volumes of air in cylinder before compression stroke and after compression stroke.
- B) volume displaced by piston per stroke and clearance volume in cylinder.
- C) ratio of pressure after compression and before compression.
- D) swept volume/cylinder volume.

74. The air standard efficiency of an otto cycle compared to diesel cycle for the given compression ratio is

- A) same
- B) less
- C) more

D) more or less depending on power rating

75. The calorific value of gaseous fuels is expressed in terms of

- A) Kcal
- B) Kcal/kg
- C) Kcal/m²
- D) Kcal/m³

76. If the intake air temperature of I.C. engine increases its efficiency will

- A) increase
- B) decrease
- C) remain same
- D) none of the mentioned

77. An engine indicator is used to determine the following

- A) Speed
- B) Temperature
- C) Volume of cylinder
- D) m.e.p and I.H.P

78. The thermal efficiency of a diesel cycle having fixed compression ratio, with increase in cut-off ratio will

- A) increase
- B) decrease
- C) be independent
- D) none of the mentioned

79. The specific fuel consumption per B.P. hour for a petrol engine is about

- A) 0.2 kg
- B) 0.25 kg
- C) 0.3 kg
- D) 0.35 kg

80. If the compression ratio in I.C. engine increases, then its thermal efficiency will

- A) increase
- B) decrease
- C) remain same
- D) none of the mentioned

81. The thermal efficiency of diesel engines on weak mixtures is

- A) unaffected
- B) lower
- C) higher
- D) dependent on other factors

82. Diesel cycle is also known as

- A) constant volume cycle
- B) constant pressure cycle
- C) constant temperature cycle
- D) none of the mentioned

83. Dissociation is the disintegration of burnt gases at _____ temperatures.

- A) low
- B) high
- C) constant
- D) none of the mentioned

84. Power output is maximum at stoichiometric ratio where there is

- A) Dissociation
- B) no dissociation
- C) rich mixture
- D) none of the mentioned

85. As compared to air cycle, in actual working, the effect of variation in specific heats is to

- A) increase maximum pressure and maximum temperature
- B) reduce maximum pressure and maximum temperature
- C) increase maximum pressure and decrease maximum temperature
- D) none of the mentioned

86. The maximum pressure and maximum temperature _____ with compression ratio.

- A) increases
- B) decreases
- C) remains same
- D) none of the mentioned

87. Fuel air ratio affects maximum power output of the engine due to

- A) higher specific heats
- B) chemical equilibrium losses
- C) all of the mentioned
- D) none of the mentioned

88. Ignition quality of petrol is expressed by

- A) octane number
- B) calorific value
- C) self ignition temperature
- D) cetane number

89. Which of the following is the lightest and most volatile liquid fuel?

- A) diesel
- B) petrol
- C) gasoline
- D) fuel oil

90. Auto-ignition temperature is

- A) maximum temperature to which oil is heated in order to give off inflammable vapour in sufficient quantity to ignite momentarily when brought in contact with a flame
- B) that at which it catches fire without external aid
- C) indicated by 90% distillation temperature
- D) none of the mentioned

91. Ignition lag is

- A) the time taken by fuel after injection to reach upto auto-ignition temperature
- B) time before actual fuel injection and the pump plunger starts to pump fuel
- C) time corresponding to actual injection and top dead center
- D) none of the mentioned

92. In order to prevent knock in the S.I. engines, the charge away from the spark plug should have

- A) low temperature
- B) low density
- C) rich mixture
- D) all of the mentioned

93. The detonation tendency in petrol engines for specified conditions of fuel rating, compression ratio, speed etc, can be controlled by having

- A) smaller cylinder bore
- B) bigger cylinder bore
- C) medium cylinder bore
- D) none of the mentioned

94. The most popular firing order in case of four cylinder in-line I.C. engine is

- A) 1-2-3-4
- B) 1-3-2-4
- C) 1-4-2-3
- D) 1-3-4-2

95. The compensating jet in a carburetor supplies almost constant amount of petrol at all speeds because the

- A) jet area is automatically varied depending on the suction
- B) the flow from the main jet is diverted to the compensating jet with increase in speed
- C) the diameter of the jet is constant and the discharge coefficient is invariant
- D) flow is produced due to the static head in the float chamber

96. In carburetors, the top of the fuel jet with reference to the level in the float chamber is kept at

- A) same level
- B) slightly higher level
- C) slightly lower level
- D) may be anywhere

97. A high flame speed is obtained in diesel engine when air fuel ratio is

- A) uniform throughout the mixture
- B) chemically correct mixture
- C) about 3-5% rich mixture
- D) about 10% rich mixture

98. During idling, a petrol engine requires _____ mixture.

- A) lean
- B) rich
- C) chemically correct
- D) none of the mentioned

99. If the density of compressed air in the combustion chamber is _____ then the resistance to the movement of the droplets is higher.

- A) high
- B) low
- C) Same
- D) none of the mentioned

100. The most accurate gasoline injection system is

- A) direct injection
- B) port injection
- C) throttle body injection

D) manifold injection

101. Main advantage of a 2-stroke engine over 4-stroke engine is

- A) More uniform torque on the crankshaft
- B) More power output for the cylinder of same dimensions
- C) Absence of valves
- D) All of the above

102. The instrument used to measure CO and CO₂ emission in the exhaust gases of an engine is

- A) FID analyser
- B) NDIR analyser
- C) Chemiluminescent analyser
- D) lemnda sensor

103. An engine using octane-air mixture has N₂, O₂, CO₂, CO and H₂O as constituents in the exhaust gas. Which one of the following can be concluded?

- A) Supply mixture is stoichiometric
- B) Supply mixture has incomplete combustion
- C) Supply mixture is rich
- D) Supply mixture is lean

104. The presence of nitrogen in the products of combustion ensures that:

- A) Complete combustion of fuel takes place
- B) Incomplete combustion of fuel occurs
- C) Dry products of combustion are analyzed
- D) Air is used for the combustion

105. _____ is a colorless, odorless, tasteless, flammable and highly toxic gas

- A) Carbon dioxide
- B) Hydrocarbons
- C) carbon monoxide
- D) sulfur

106. Which one of the following set of material is most commonly used in catalytic converters for CI engines?

- A) platinum, palladium and rhodium
- B) palladium, rhodium and ruthenium
- C) rhodium, ruthenium and platinum
- D) ruthenium, platinum and palladium

107. Consider the following emissions of an IC engines

- 1) CO₂

- 2) HC
- 3) NO_x
- 4) Particulates

Which of these emissions cause photochemical smog?

- A) 1 & 4
- B) 1 & 2
- C) 2 & 3
- D) 3 & 4

108. A 4-stroke engine develops indicated power of 325 kW at 2500 rpm. If mech. efficiency is 80%, the torque at crank is

- A) 104 N-m
- B) 993 N-m
- C) 624 N-m
- D) 500 N-m

109. Besides mean effective pressure the data needed for determining the indicated power of an engine would include.

- A) piston diameter, length of stroke and calorific value of fuel
- B) piston diameter, specific fuel consumption and calorific value of fuel
- C) piston diameter, length of stroke and speed of rotation
- D) specific fuel consumption, speed of rotation and torque

110. Morse test is used to determine mechanical efficiency of

- A) Single cylinder CI engine
- B) Multi cylinder engines
- C) Two stroke engines
- D) four stroke engines

111. Morse test in multi cylinder engines is used to determine

- A) air flow to the engine
- B) Mechanical efficiency
- C) Indicated power
- D) B & C

112. Three-way catalytic convertor cannot control which one of the following:

- A) PM emission
- B) NO_x emission

C) CO emission

D) HC emission