Register Number

2022
PAPER – I
AUTOMOBILE ENGINEERING
(Degree Standard)

Duration : Three Hours]   **[Total Marks : 300**

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. You will be supplied with this question booklet 15 minutes prior to the commencement of the examination.

2. This question booklet contains **200 questions**. Before answering the questions, you shall check whether all the questions are printed serially and ensure that there are no blank pages in the question booklet. **If any defect is noticed in the question booklet, it shall be reported to the invigilator within the first 10 minutes and get it replaced with a complete question booklet. If the defect is reported after the commencement of the examination, it will not be replaced.**

3. Answer all the questions. All the questions carry equal marks.

4. You must write your register number in the space provided on the top right side of this page. Do not write anything else on the question booklet.

5. An answer sheet will be supplied to you separately by the room invigilator to shade the answers. Instructions regarding filling of answers etc., which are to be followed mandatorily, are provided in the answer sheet and in the memorandum of admission (Hall Ticket).

6. You shall write and shade your question booklet number in the space provided on page one of the answer sheet with **BLACK INK BALL POINT PEN.** If you do not shade correctly or fail to shade the question booklet number, your answer sheet will be invalidated.

7. Each question comprises of five responses (answers) : i.e. (A), (B), (C), (D) and (E). You have to select ONLY ONE correct answer from (A) or (B) or (C) or (D) and shade the same in your answer sheet. If you feel that there are more than one correct answer, shade the one which you consider the best. **If you do not know the answer, you have to mandatorily shade (E).** In any case, choose ONLY ONE answer for each question. If you shade more than one answer for a question, it will be treated as a wrong answer even if one of the given answers happens to be correct.

8. You should not remove or tear off any sheet from this question booklet. You are not allowed to take this question booklet and the answer sheet out of the examination room during the time of the examination. After the examination, you must hand over your answer sheet to the invigilator. You are allowed to take the question booklet with you only after the examination is over.

9. **You should not make any marking in the question booklet except in the sheets before the last page of the question booklet, which can be used for rough work. This should be strictly adhered to.**

10. Failure to comply with any of the above instructions will render you liable for such action as the Commission may decide at their discretion.

SPACE FOR ROUGH WORK

1. Wearing of crankshaft main bearings and journals occurs due to

    (A) Lack of oil

    (B) Scratches by dirt in the oil

    (C) Friction between connecting rod and crank pin

    (D) Both (A) and (B)

    (E) Answer not known

2. Air will be drawn into the cooling system if there are leaks at any point between

    (A) Water pump and jackets

    (B) Radiator and water pump

    (C) Thermostat and Radiator

    (D) Radiator cap and expansion tank

    (E) Answer not known

3. "Tune up" is the name given for

    (A) Scheduled Maintenance

    (B) Periodic Maintenance

    (C) Preventive Maintenance

    (D) Breakup Maintenance

    (E) Answer not known

4. Noise from the transmission in reverse could be caused by

   (A) ✓ Worn or damaged reverse idler gear

   (B) Defective front-bearing retainer

   (C) Clutch not disengaging

   (D) Worn (or) wise pilot bearing

   (E) Answer not known

5. Technician (A) says to rest for slipping of clutch by shifting the transmission into low gear.

   Technician (B) says to test for a slipping of clutch with parking brake firmly engaged.

   Identify the correct technician or technician's

   (A) Technician (A)

   (B) ✓ Technician (B)

   (C) Both (A) and (B)

   (D) Neither (A) nor (B)

   (E) Answer not known

6. Gear clash while shifting could be caused by

   (A) Gear loose on the main shaft

   (B) Clutch not engaging

   (C) Broken shift fork

   (D) ✓ Horn synchronizer ring

   (E) Answer not known

7. Noise from transmission in gear could be caused by

   (A) A worn or loose pilot bearing

   (B) Excessive lubricant

   (C) ✓ Worn or damaged gear teeth and synchronizers

   (D) Defective front – bearing retainer

   (E) Answer not known

8. Authorised officer seize a vehicle when

   (A) The vehicle is not covered by a valid insurance

   (B) The vehicle exceeds the speed limit

   (C) Driver does not have license

   (D) The vehicle is not covered by a valid resistration (or) permit ✓

   (E) Answer not known

9. A motor cycle without gear may be driven by a person after attaining the age of _____.

   (A) 12

   (B) 14

   (C) 16 ✓

   (D) 17

   (E) Answer not known

10. No learner's licence shall be issued to any applicant unless he/she passes to the satisfaction of the licencing authority, such test may be presribed by

   (A) Central Government ✓

   (B) State Government

   (C) Nagar palika

   (D) District magistrate

   (E) Answer not known

11. Painting and Priming are done to protect the body from :

1. Corrosion
2. Damage
3. Corrosion, strength
4. Appearance

(A) 1 and 2 only   (B) 3 only

(C) 2 and 4 only   (D) 3 and 4 only ✓

(E) Answer not known

12. Sequence the order of Executions :

1. Press the remote key of the car
2. The Receiver picks up the code
3. Complex code is transmitted
4. Electrical signal is sent to the control unit
5. If code is correct, relays are triggered and doors are open

(A) 1 – 2 – 3 – 4 – 5   (B) 1 – 3 – 2 – 4 – 5 ✓

(C) 1 – 3 – 4 – 5 – 2   (D) 1 – 4 – 5 – 2 – 3

(E) Answer not known

13. Choose the correct answer :

The Electronic control unit on the outer side of the seats adjusts the following

(1) Height of seat
(2) Angle of the seat
(3) Back-rest angle of the seat
(4) Seat distance from the rear side

(A) (1) only

(B) (2) only

(C) (1), (2) and (3) ✓

(D) (1) (2) and (4)

(E) Answer not known

14. Choose the sequence in developing a car model through shape optimization for reduced drag.

    (A) Basic shape – Basic body – Basic model – Styling model

    (B) Basic model – Basic body – Basic shape – Styling model

    (C) Basic body – Basic shape – Basic model – Styling model ✓

    (D) Styling model – Basic shape – Basic body – Basic model

    (E) Answer not known

15. Along the coefficient of Drag, The most important aerodynamic aspect of a car's shape is

    (A) Rear end of the car

    (B) Front end of the car ✓

    (C) Height of the car

    (D) Roof curvature of the car

    (E) Answer not known

16. In case of open circuit windtunnel, to avoid flow reversal, the exit pressure should be ————— the atmospheric pressure.

    (A) equal to

    (B) greater than ✓

    (C) lesser than

    (D) not related

    (E) Answer not known

17. The seat belt tensioners are built in the ——————.

   (A) Shoulder anchors

   (B) Front seats

   ✓(C) Seat belt retractors

   (D) Seat belt buckles

   (E) Answer not known

18. The roof panels and outer ponds of a conventional bus body are joined by ——————.

   (A) brazing

   (B) blasting

   ✓(C) riveting

   (D) bolting

   (E) Answer not known

19. —————— is the shut face for front door and the tinge pillar for rear door.

   (A) A pillar post

   ✓(B) B pillar post

   (C) C pillar post

   (D) D pillar post

   (E) Answer not known

20. The releasing and Reapplying of the brakes in succession, which takes place in a 'ABS' is called

(A) Acceleration Modulation   (B) Brake Modulation

(C) Pressure Modulation   (D) Velocity Modulation

(E) Answer not known

21. Disc brakes self - Adjust when the lining wear allows the piston to

(A) Contact the Disc

(B) Slide outward through the seal

(C) Cause Seal Deflection

(D) Reposition the seal groove in the caliper

(E) Answer not known

22. Self energizing brakes are having the ability of ——————.

(A) Utilizing the force of the brake fluid to increase the brake pressure

(B) Utilizing the force of the engine vacuum to increase the brake pressure

(C) Utilizing the force of the rotating drum to increase the brake pressure

(D) Utilizing the force of the power steering to increase the brake pressure

(E) Answer not known

23. The front end of a Vehicle with front disc and rear drum brakes dips excessively when the brakes are applied. This may be caused by a defective ——————.

(A) Proportioning valve   (B) Pressure - differential valve

(C) Metering valve   (D) Check valve

(E) Answer not known

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24. Which is / are correct relating to brakes?

   (1) If coefficient of friction is too high, the brakes will be too "grabby" and it will be very easy to control.

   (2) If coefficient of friction is too low, then it will not stop the vehicle effectively.

   (A) (1) only   (B) (2) only ✓
   (C) Both (1) and (2)   (D) Neither (1) nor (2)
   (E) Answer not known

25. ——————— is a suspension system in which the wheels are mounted rigidly on the half axle and pivoted on their ends to the chasis at the middle of the car.

   (A) Mac Pherson start type suspension
   (B) Swinging half axle suspension
   (C) Trailing link suspension ✓
   (D) Wish bore type suspension
   (E) Answer not known

26. Which of the following is not a type of gear box?

   (A) Sliding mesh   (B) Constant mesh
   (C) Synchromesh   (D) Differential mesh ✓
   (E) Answer not known

27. Choose the wrong statement about leaf spring.

   (i) Semi Elliptic leaf springs are used in light vehicles
   (ii) Semi Elliptic leaf springs are used in heavy vehicles
   (iii) Both ends of the leaf spring connected rigidly with frame of the vehicle
   (iv) The leaf spring one end connected with frame and other end connected with shackle of the vehicle

   (A) (i), (ii) and (iii)   (B) (i) only
   (C) (ii) only   (D) (iii) only ✓
   (E) Answer not known

28. A stabilizer bar has no effect during

    (A)   Vehicle turns as a curve

    (B)   Vehicle travelling as a smooth surface ✓

    (C)   One of the tire hits as bump

    (D)   One of the tire hits on pothole

    (E)   Answer not known

29. ———————— is NOT a part of an sprung mass?

    (A)   Propeller shaft ✓

    (B)   Tyres

    (C)   Wheels

    (D)   Damper

    (E)   Answer not known

30. A Mac-pherson short type of suspension on uses

    (A)   half-axle

    (B)   lower wishbores ✓

    (C)   Trailing Link

    (D)   Upper and lower wishbores

    (E)   Answer not known

31. Which one of the following wheels are more prone to corrosion?

   (A) Carbon fibre wheels

   (B) Composite wheels

   (C) Aluminium alloy wheels

   (D) Magnesium alloy wheels

   (E) Answer not known

32. With this type of rear axle, the axle can be removed from the honging without disturbing the wheel.

   (A) Full-floating axle

   (B) Semi-floating axle

   (C) Three quarter-floating axle

   (D) Two speed axle

   (E) Answer not known

33. The semi floating rear axle shaft does not withstand

   (A) Bending moment

   (B) End thrust

   (C) Prising torque

   (D) Twisting moment

   (E) Answer not known

34. Torque tube drive is used in

   (A) Commercial vehicle such as trucks and buses ✓

   (B) Defense vehicle

   (C) Passenger cars

   (D) Jeeps

   (E) Answer not known

35. In a limited slip differential, when one wheel starts to spin

   (A) The pinion gears are demeshed from the side gears

   (B) The ring gear is held stationary

   (C) All the torque goes to the spinning wheel

   (D) The differential side gears become locked to the case by usuage of clutches or cones ✓

   (E) Answer not known

36. When vehicle moves in straight path, the condition of planet gear is

   (A) Spins about its own axis ✓

   (B) Spins about its own axis and revolves around sun gear

   (C) Only revolves around sun gear

   (D) Idle

   (E) Answer not known

37. In davis steering mechanism, the equation for correct steering is where

b – Distance between the pivots

l – Wheel base

α – Cross-Arm angle

(A) $\tan \alpha = \dfrac{b}{2l}$

(B) $\cot \alpha = \dfrac{b}{2l}$

(C) $\tan \alpha = \dfrac{l}{2b}$

(D) $\cot \alpha = \dfrac{l}{2b}$

(E) Answer not known

38. For centre point steering, the camber angle

(A) Should not exceed 2 degrees
(B) Between 2 to 5 degrees
(C) Between 5 to 10 degrees
(D) More than 10 degrees
(E) Answer not known

39. Semi forward chassis refers to vehicle in which

(A) Engine is fitted outside the driver cabin
(B) Engine is fitted behind the driver cabin
(C) Engine is fitted rear side of the vehicle
(D) Half portion of engine is in the driver cabin and the remaining is outside the cabin
(E) Answer not known

40. Which are the correct statements about superchargers?

(i) Axial and radial compressors can be more adequately driven by a turbine to form a turbo charger

(ii) Axial and radial flow compressors are of static type

(iii) The advantage of turbochargers over superchargers stems from their use of recovered exhaust gas energy during the engines blow down stage

(A) (i) and (iii) only   (B) (ii) only

(C) (ii) and (iii) only   (D) (i), (ii) and (iii)

(E) Answer not known

41. The maximum temperature of the burned gas in the I.G. engine cylinder is of the order of

(A) $500 - 1000°C$ (B) $1000 - 1500°C$

(C) $1500 - 2000°C$ (D) $2000 - 2500°C$

(E) Answer not known

42. 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 centre

(D) Time corresponding to actual injection and bottom dead centre

(E) Answer not known

43. With increase in intake temperature of charge, the delay period

(A) Decreases   (B) First decreases then increases

(C) Increases   (D) Not affected

(E) Answer not known

44. Thermosiphon cooling system uses the principle of

    (A)   Difference in pressures of hot and cold regions of coolant

    (B)   Difference in flow rates of hot and cold regions of coolant

    (C)   Difference in viscosities of hot and cold regions of coolant

    (D)   Difference in densities of hot and cold regions of coolant

    (E)   Answer not known

45. Instrument is recommended for checking the degree of antiframe protection in a heavy-duty diesel engine coolant

    (A)   Hydrometer

    (B)   Refractometer

    (C)   Spectrographic analyser

    (D)   Viscometer

    (E)   Answer not known

46. The fuel in the carburettor float bowl is kept at a constant level by the action of the

    (A)   Float and needle valve

    (B)   Pressure regulator

    (C)   Opening of the throttle valve

    (D)   Fuel pump

    (E)   Answer not known

47. A device to relieve the vapour pressure developed in the carburettor due to the vaporisation of fuel in hot weather

    (A)   Anti-percolator

    (B)   Discharge jet

    (C)   Metering rod

    (D)   Venturi

    (E)   Answer not known
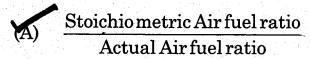
48. The opposed cylinder Engine has

    (A)   One Crankshaft and one cam shaft
    (B)   One Crankshaft and two cam shaft
    (C)   One Crankshaft and two cam shaft
    (D)   One Crankshaft and four cam shaft
    (E)   Answer not known

49. The function of Delivery valve in the fuel injection pump of a diesel engine is

    (A)   To cut off the fuel communication between the pump & Nozzle when fuel pressure is reduced.
    (B)   To act as a non return valve for the fuel to come back to the pump.
    (C)   Both (A) & (B)
    (D)   None of the above.
    (E)   Answer not known

50. Cavitation chances in wet liners of Engine gliner

    (A)   More than Dryliners
    (B)   Equal to Dryliner
    (C)   Less than Dryliner
    (D)   No cavitation
    (E)   Answer not known

51. In four stroke engines, can shaft rotates at _____ of crank shaft

    (A)   Same speed
    (B)   Half the speed
    (C)   Twice the speed
    (D)   Four times the speed
    (E)   Answer not known

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[Turn over

52. The unreacted ammonia in the exhaust of a SCR system is called as

(A) Ammonia Slip

(B) Ammonia Sleep

(C) Ammonia Deposit

(D) Ammonia Catalyst

(E) Answer not known

53. The catalyst used in the SCR system is

(A) Rhodium based

(B) Copper based

(C) Vanadium based

(D) Cobalt based

(E) Answer not known

54. Catalytic substance used in a catalytic convertor is

(A) Lithium

(B) Silicon

(C) Carbon

(D) Platinum

(E) Answer not known

55. The EGR reduces the NO_x emission by

(A) Supplying more oxygen

(B) Supplying more fuel

(C) Controlling combustion rate

(D) Cooling the engine

(E) Answer not known

56. The solid carbon particles are generated in CI engines due to

    (A) Lean fuel region   (B) Rich fuel region
    (C) Stoichiometric fuel region (D) Both (B) and (C)
    (E) Answer not known

57. Rhodium is the best catalyst to control NO$_x$, but air-fuel ratio must be within a range of

    (A) 15.6:1 to 15.8:1   (B) 13.2:1 to 13.4:1
    (C) 14.6:1 to 14.7:1   (D) 10.1:1 to 10.2:1
    (E) Answer not known

58. In, position the CO emission is less

    (A) Sudden throttle   (B) Full throttle
    (C) Part throttle   (D) Fully closed
    (E) Answer not known

59. Identify the following statements which are correct.

    Statement (1):- Carbon monoxide results from complete combustion in rich air fuel mixture due to an air deficiency.

    Statement (2):- Hydrocarbon emissions are the result of inadequate oxygen being present to support complete combustion of the air / fuel mixture

    Statement (3):- The formation of oxides of nitrogen (NO$_x$) are due to combustion of oxygen nitrogen at high temperature.

    (A) Statements 1, 2 and 3 are correct
    (B) Statement 1 is incorrect and 2 & 3 are correct
    (C) Statement 2 and 3 are incorrect and 1 is correct
    (D) Statement 1 and 3 are correct and 2 is incorrect
    (E) Answer not known

60. _____ is a type of automatic suspension that controls the vehicle movement of the wheel receive to chess with an on board system.

(A) Active suspension

(B) Passive suspension

(C) Reactive suspension

(D) Semi passive suspension

(E) Answer not known

61. Equivalence Ratio is given by,

(A) $\dfrac{\text{Stoichio metric Air fuel ratio}}{\text{Actual Air fuel ratio}}$

(B) $\dfrac{\text{Actual Air fuel Ratio}}{\text{Stoichio metric Air fuel ratio}}$

(C) $\dfrac{\text{Air Mixture Ratio}}{\text{Fuel Mixture Ratio}}$

(D) $\dfrac{\text{Fuel Mixture Ratio}}{\text{Air Mixture Ratio}}$

(E) Answer not known

62. Traction control is initiated when

(A) Front wheels rotate freely

(B) Rear wheels is rotate freely

(C) All wheels rotate freely in 2WD vehicle

(D) Driven wheel spins freely without vehicle movement

(E) Answer not known

63. The PID controller consists _____ sub controllers for the longitudinal and lateral dynamics.

   (A) Only one

   (B) Two ✓

   (C) Three

   (D) Not limited

   (E) Answer not known

64. Statement (1) : Decreasing suspension stiffness improves ride quality and road holding. However, it increases rattle space requirement.

   Statement (2) : Increased suspension damping reduces reasonant vibration at the sprung mass frequency. However, it also results in increased high frequency harshness.

   (A) Both statements (1) and (2) are incorrect

   (B) Both statements (1) and (2) are correct ✓

   (C) Statement (1) is correct and (2) is incorrect

   (D) Statement (1) is incorrect and (2) is correct

   (E) Answer not known

65. For a typical driveline modeling

   Assertion (A) : Vehicle resistive forces—rolling, aerodynamic, gradient, and inertial forces are calculated

   Reason (R) : Sizing of the component-engine, clutch, transmission, drive shafts and final wheel drive axle assembly and drives.

   (A) Both (A) and (R) are true, and R is the correct explanation of A ✓

   (B) Both (A) and (R) are true, and R is not the correct explanation of A

   (C) A is true and R is false

   (D) A is false and R is true

   (E) Answer not known

66. The output of feedback control system must be a function of

    (A)   Reference input

    (B)   Reference output

    (C)   Output and feedback signal

    (D)   Input and feedback signal ✓

    (E)   Answer not known

67. An open–loop control system

    (A)   Has a controller k=1 in the closed loop system

    (B)   Corrects for disturbance acting on the system

    (C)   Responds well to incorrect system models

    (D)   Must be altered manually to deal with disturbances ✓

    (E)   Answer not known

68. In yaw stability control under steer correction is done by applying the brakes at _____.

    (A)   Inner front wheel ✓

    (B)   Outer front wheel

    (C)   Both wheels of front axle

    (D)   Both outer wheels

    (E)   Answer not known

69. A Vehicle has

    (A)   12 Degrees of freedom

    (B)   10 Degrees of freedom

    (C)   8 Degrees of freedom

    (D)   6 Degrees of freedom ✓

    (E)   Answer not known

70. The antilock brake system will come into action when the

(A) Wheel slip exceeds 25% ✓
(B) Wheel slip is less than 25%
(C) Vehicle deceleration is very high
(D) Load transfer to front axle is very high
(E) Answer not known

71. Consider a uniform rod of length 'l' cross sectional area 'A', young's modulus E, subjected to an axial tensile force F, The equivalent spring constant is

(A) $\dfrac{AE}{Fl}$

(B) $\dfrac{Fl}{AE}$

(C) $\dfrac{AE}{l}$ ✓

(D) $\dfrac{l}{AE}$

(E) Answer not known

72. Consider the following Statement:

Assertion(A) : Semi active Suspension system cannot cause the suspension system to become unstable

Reason(R) : Semi active system actively supply energy to the system and it also dissipates the energy.

(A) (A) is true and (R) is false ✓
(B) (A) is false and (R) is true
(C) (A) and (R) are true and (R) is the correct explanation of (A)
(D) (A) and (R) are true, and (R) is not the correct explanation of (A)
(E) Answer not known

73. In Full Car model _____ can be Studied.

(i) Pitching motion
(ii) Bouncing motion
(iii) Yawing motion
(iv) Rolling motion

(A) (i), (iii), (iv)
(B) (ii), (iii), (iv)
(C) (i), (ii), (iii)
(D) (i), (ii), (iv) ✓
(E) Answer not known

74. The Lateral Force on the rolling tyre can be caused by the tyre _____ to the direction of travel.

(A) Rolling straight

(B) Rolling diagonal

(C) Rolling backwards

(D) Both (A) and (C)

(E) Answer not known

75. When the Load on the tyre increases, the cornering force generated will

(A) Not change (No Effect)

(B) Will Remain Constant

(C) Increases

(D) Increases and then Falls

(E) Answer not known

76. Match the following :

	Direction		Force and Moment
(a)	Longitudinal	(1)	Drag–Rolling Moment
(b)	Lateral	(2)	Lift–Pitching Moment
(c)	Vertical	(3)	Side Force–Yawing Moment

	(a)	(b)	(c)
(A)	1	2	3
(B)	1	3	2
(C)	2	1	3
(D)	3	2	1

(E) Answer not known

77. Consider the following statement:

Assertion (A) : Improved cornering, braking and traction are obtained if the variation in normal tire loads are maximized

Reason (R) : The lateral and longitudinal forces generated by a tire depend directly on the normal tire load.

(A) (A) is true, but (R) is false

(B) (A) is false, but (R) is true

(C) Both (A) and (R) are true, and (R) is the correct explanation of (A)

(D) Both (A) and (R) are false, and (R) is not the correct explanation of (A)

(E) Answer not known

78. _____ number of Jane way's comfort criterion are available to obtain the information regarding vibration tolerance.

(A) Two

(B) Three

(C) Four

(D) Five

(E) Answer not known

79. An engine weighing 1784.5N supported by three helical spring and it operates at 900 rpm, with natural frequency (during design) is 24.3 rad/sec. Evaluate the stiffness of each spring

(A) 107413.8 N/m

(B) 35804 N/m

(C) 71609.2 N/m

(D) 17902 N/m

(E) Answer not known

80. The equation of free vibration of a system is $x + 36 \pi^2 x = 0$, then its frequency is

(A) 6 Hz

(B) 3π Hz

(C) 3 Hz

(D) 6π Hz

(E) Answer not known

81. The duty cycle is associated with

(A) Analog signals

(B) Pulse width modulated signals ✓

(C) Crankshaft sensor signal

(D) Emission control

(E) Answer not known

82. Why are slip rings in an alternator necessary?

(A) They permit the stator to rotate

(B) They provide a high resistance connection to the stator windings

(C) They prevent a delta from forming

(D) They permit current to flow through a rotating component called the rotor ✓

(E) Answer not known

83. The frequency of dynamo generated d.c is

(A) 50 Hz

(B) 60 Hz

(C) 0 Hz ✓

(D) 1 Hz

(E) Answer not known

84. The following is a permanent type anti-freeze material used in air conditioned cars.

(A) Denatured Alcohol

(B) Ethylene glycol

(C) Glycerine

(D) Wood Alcohol

(E) Answer not known

85. The main aim of an automobile air conditioning system is to control

(A) Temperature and pressure

(B) Pressure and humidity

(C) Humidity and temperature

(D) Dust in the air

(E) Answer not known

86. Dwell is the

(A) Length of time it takes the points to close

(B) Length of time the points are open

(C) Number of degrees of cam rotation that the points are closed

(D) Number of degrees of cam rotation that the points are open

(E) Answer not known

87. To adjust the ignition timing

   (A) turn the cam on the camshaft

   (B) turn the distribution in its mounting ✓

   (C) install different centrifugal advances springs

   (D) readjust the contact points

   (E) Answer not known

88. From alternator to battery the following device is necessary while charging

   (A) A capacitor

   (B) A solenoid valve

   (C) A rheostat

   (D) A full wave rectifier ✓

   (E) Answer not known

89. "Maintance free" batteries use about ——————% calcium instead of orbitory

   (A) 0.1 ✓

   (B) 0.3

   (C) 0.4

   (D) 0.6

   (E) Answer not known

90. The central gear of an epicyclic gear set is called a

   (A) Ring gear

   (B) Sun gear ✓

   (C) Planet gear

   (D) Internal gear

   (E) Answer not known

91. The torque Converter has maximum efficiency at

   (A) Lock up ✓

   (B) Low speed

   (C) Stop

   (D) High speed

   (E) Answer not known

92. Maximum torque multiplication by the torque convertor occurs at

   (A) Low speed

   (B) High speed

   (C) Stop ✓

   (D) Medium speed

   (E) Answer not known

93. The number of Shafts in a gear box will be

 (A) 6

 (B) 4

 (C) 3 ✓

 (D) 2

 (E) Answer not known

94. Gear box units emit Hissing noise, due to

 (A) Breakage of gear teeth

 (B) Starvation of oil I bearing ✓

 (C) Low oil level in gear box

 (D) Wrong assembly of gear box

 (E) Answer not known

95. If the transaxle slips out of gear, the cause could be except out the following,

 (A) improperly adjusted linkage

 (B) transmission loose on engine

 (C) dirt between the clutch cover and engine

 (D) worn out of constant mesh gears (or) synchronizer ✓

 (E) Answer not known

96. Clutch chattering (or) grabbing is noticeable

   (A) when engaging the clutch

   (B) at low speed

   (C) during idle

   (D) during acceleration

   (E) Answer not known

97. The tapered finger type or crown type spring is used in

   (A) Centrifugal clutch

   (B) Semi-centrifugal clutch

   (C) Diaphragm clutch

   (D) Cone clutch

   (E) Answer not known

98. Clutch slippage can be caused by all of the following except;

   (A) incorrect linkage adjustment

   (B) loose friction disk facings

   (C) grease on the facings

   (D) broken (or)weak pressure springs

   (E) Answer not known

99. Excessive fire wear at the middle is due to

   (A) Low inflation pressure

   (B) High inflation pressure

   (C) Improper camber

   (D) Improper toe-in setting

   (E) Answer not known

100. Best Spanner for Automobile work is the

   (A) Open-Ended Type

   (B) Combination Type

   (C) Ring Type

   (D) Socket Type

   (E) Answer not known

101. Noise from a rear axla drive, when going around a curve in dineates trouble

   (A) Inside the differential

   (B) Caused by a wom ring gear

   (C) Caused by a wom drive pinon gear

   (D) Due to slippage of the clutch

   (E) Answer not known

102. The Engine Starts, but Stops immediately, the causes would be

   (A) Carburettor overflow

   (B) Chocked Siencer

   (C) Seized Engine

   (D) Both (A) and (B)

   (E) Answer not known

103. The following possible cause and correction measures required, when Engine will not Crank?

(A) Cause   – Run down Battery

      Remedies/Correction – Recharge (or) replace battery

(B) Cause   – Defective fuel system

      Remedies/Correction – Check fuel system

(C) Cause   – Defective starting motor

      Remedies/Correction – Repair (or) Replace starting motor

(D) Cause   – Bad Connection in starting circuit

      Remedies/Correction – Repair (or) clean and tighten the starting circuit

(E) Answer not known

104. To help reduce the stock of engagement, the frictions disc has a series of waved

(A) Cusshiore pads

(B) Facings

(C) Cusshiore springs

(D) Discs

(E) Answer not known

105. The transmission may stick in gear became,

(A) The gear shift linkage is out of adjustment ✓

(B) Excessive clutch pedal freeplay

(C) Worn out bearings

(D) Synchronizer damaged

(E) Answer not known

106. No person under the age of _____ shall drive a motor vehicle in any public place.

(A) 17

(B) 18 ✓

(C) 19

(D) 21

(E) Answer not known

107. Diesel particulate Filter [DPE] is used to control _____ emission.

(A) Hydro carbon [HC]

(B) Carbon monoxine [CO]

(C) Particulate matter [PM] ✓

(D) Nitrogen oxides [NOx]

(E) Answer not known

108. Chapter VIII of motor vehicle act deals with

   (A)   Licensing of driver

   (B)   Vehicle Registration

   (C)   Motor vehicle insurance ✓

   (D)   Miscellaneous

   (E)   Answer not known

109. As per resolution adopted by WP29 of UNECE _____ falls under category N.

   (A)   Motor vehicles with less than 4 wheels

   (B)   Power driver vehicles with a least 4 wheels for carriage of passengers

   (C)   Agricultural and forestry tractors

   (D)   Power driver vehicles with at least 4 wheels for carriage of goods ✓

   (E)   Answer not known

110. Thinner is added to the paint in order to

   (A)   Make pigments and resins mix easily

   (B)   Reduce paint viscosity ✓

   (C)   Make paint film hard

   (D)   Good apperance

   (E)   Answer not known

111. _____ is the longitudinal framing of the roof at the joining.

    (A) Can't panel

    ✓(B) Can't rail

    (C) Cowl panel

    (D) Drip rail

    (E) Answer not known

112. Which one of the following is incorrect with respect to integral bus body design?

    (A) Lower floor level

    (B) Supports rear engine location

    ✓(C) Easy repair and maintenance

    (D) Low noise level in passenger region

    (E) Answer not known

113. In a Driver's seat design the brake pedal force is

    ✓(A) Directly proportional to knee angle

    (B) Inversely proportional to knee angle

    (C) Constant to knee angle

    (D) Exponentially to knee angle

    (E) Answer not known

114. ———————— cross section test region is adopted in automotive testing.

    (A) Circular   (B) Elliptical

    (C)✓ Rectangular   (D) Triangular

    (E) Answer not known

115. Which of the following statements are true for Aerodynamic Noise?

    (i)   Noise from wing mirror, Aerial and Door Handles

    (ii)   Noise created by door seals

    (iii) Noise from the under side of the hood

    (iv) Noise from the exhaust system

    (A) (i) and (iii) only

    (B)✓ (i) and (ii) only

    (C) (iii) and (iv) only

    (D) (ii) and (iv) only

    (E) Answer not known

116. Hatch back cars are subjected to dirt formation at

    (A)✓ Rear wind screen

    (B) Front wind screen

    (C) Front grille

    (D) The Car roof

    (E) Answer not known

117. Which one of the following influence the increase of aerodynamic coefficient of a car?

    (A)✓ Reducing roof Camber

    (B) Rounding off bonnet edges

    (C) Rounding of A – Pillars

    (D) Increasing sider Camber

    (E) Answer not known

118. Sport car with fold flat wind screen is called

　(A)　Torpedo

　(B)　Estate car

　(C)　Limousine

　(D)　Sedan

　(E)　Answer not known

119. Jacking points of a car must always be located in a zone of

　(A)　High Bending Strength

　(B)　Moderate Bending Strength

　(C)　Moderate Twisting Strength

　(D)　High Twisting Strength

　(E)　Answer not known

120. The chemicals that undergo reaction during airbag deployment are
——————— to produce N_2 gas.

　(A)　$Na_2O_3 + NaCl + NO_2$

　(B)　$Na_2O_3 + KNO_3 + NO_2$

　(C)　$NaN_3 + NaCl + SiO_2$

　(D)　$NaN_3 + KNO_3 + SiO_2$

　(E)　Answer not known

121. 'Fading' action occurs in the brake linings due to ———————.

　(A)　Continuous brake application

　(B)　High speed of vehicle

　(C)　Low speed of vehicle

　(D)　Worn brake linings

　(E)　Answer not known

122. In case of front wheel disc brake, the caliper assembly is secured to

    (A) King pin   (B) Steering gear box

    (C) Steering knuckle   (D) Tie rod

    (E) Answer not known

123. The brake shoes used in drum brakes are —————.

    (A) Front and rear shoes

    (B) Dependent and Independent shoes

    (C) Leading and trailing shoes

    (D) Floating and sliding shoes

    (E) Answer not known

124. Which is / are correct relating to brake shoe

    (1) The lining on a secondary shoe is usually longer than that on a primary shoe.

    (2) Rivitted lining is secured to the shoe by a group of hardened steel rivets

    (A) (1) only   (B) (2) only

    (C) Both (1) and (2)   (D) Neither (1) nor (2)

    (E) Answer not known

125. A rear disc brake with an integral parking brake has

    (A) a separate fluid reservoir for parking brake

    (B) a piston that can be operated hydraulically or mechanically

    (C) a small brake drum mounted on the rear axle half shaft

    (D) two shoes in a hub mounted drum brake

    (E) Answer not known

126. Which of the following is / are correct with respect to rear axle housing

    (i)   One piece housing is called as split type

    (ii)   In Banjo type, the complete differential is carried in a separate carried. Which is bolted to the axle housing.

    (iii) In split type if there is any fault, the whole of the rear axle has to be removed as an unit and then service

    (A)   (i), (ii) only   (B) (ii), (iii) only

    (C)   (i), (iii) only   (D) (i), (ii), (iii)

    (E)   Answer not known

127. The disadvantage of using transverse leaf springs is a tendency of a vehicle to —————— when it runs fast on sharp corners.

    (A)   Pitch   (B) Yaw

    (C)   Roll   (D) Slide

    (E)   Answer not known

128. The arrangement in automobile used to maintain correct alignment of the axle with the frame is

    (A)   Coil springs   (B) Torsion Bars

    (C)   Torque Rods   (D) Stabilizer unit

    (E)   Answer not known

129. When the shock absorber is compressed or telescoped, fluid passes through the piston orifices and

    (A)   Out of the reservoir

    (B)   Into the upper part of the cylinder

    (C)   Into the piston rod

    (D)   Out of the piston rod

    (E)   Answer not known

130. In p-metric tire designation of P265/70 R17, the value 17 represents

    (A)   Wheel diameter

    (B)   Rim diameter

    (C)   Wheel width

    (D)   Rim width

    (E)   Answer not known

131. Which part of the automobile tyre is subjected to greatest flexing action?

    (A)   Bead

    (B)   Sidewall

    (C)   Shoulder

    (D)   Tread

    (E)   Answer not known

132. The sectional width and sectional height of a tyre designated as 180/60 R 16 92 H is ——————— and ——————— respectively

    (A)   180 mm and 60 mm

    (B)   60 mm and 180 mm

    (C)   180 mm and 108 mm

    (D)   60 mm and 108 mm

    (E)   Answer not known

133. The high frequency and low amplitude vibration are absorbed by

    (A)   Spring

    (B)   Damper

    (C)   Wheel and Seat

    (D)   Chanis frame

    (E)   Answer not known

134. —————————— system selectively applies brakes. when one or more wheels are slipping, so that the remaining wheels gains speed.

(A) Anti-lock braking

(B) Traction control ✓

(C) Tire pressure monitoring

(D) Lane assist

(E) Answer not known

135. When a vehicle is Negotiating left turn, the torque due to differential action is ——————————

(A) Zero on both wheels

(B) Greater in left wheel than right wheel

(C) Greater in right wheel than left wheel

(D) Equally divided to both wheels ✓

(E) Answer not known

136. Noise from a rear wheel drive axle when going around a curve indicates trouble

(A) Caused by a worn ring gear

(B) Caused by a worn drive – pinion gear

(C) Due to slippage of the clutch

(D) Inside the differential ✓

(E) Answer not known

137. Which of the following is/are correct?
  1. A worm and roller type steering gear is also called as Gemmer gear
  2. Pack and pinion type steering gear is also called as Ross gear
  (A) 1 only
  (B) 2 only
  (C) Both 1 and 2
  (D) Neither 1 nor 2
  (E) Answer not known

138. In a steering gear box, the forward and reverse efficiency is defined by ——————— and ——————— respectively.

  (A) $\dfrac{\text{Output work at steering wheel}}{\text{Input work at drop arm}} \times 100\%$;

  $\dfrac{\text{Output work at steering wheel}}{\text{Input work at drop arm}} \times 100\%$

  (B) $\dfrac{\text{Input work at steering wheel}}{\text{Output work at drop arm}} \times 100\%$;

  $\dfrac{\text{Input work at steering wheel}}{\text{Output work at drop arm}} \times 100\%$

  (C) $\dfrac{\text{Output work at drop arm}}{\text{Input work at steering wheel}} \times 100\%$;

  $\dfrac{\text{Output work at steering wheel}}{\text{Input work at drop arm}} \times 100\%$

  (D) $\dfrac{\text{Input work at drop arm}}{\text{Output work at steering wheel}} \times 100\%$;

  $\dfrac{\text{Input work at steering wheel}}{\text{Output work at drop arm}} \times 100\%$

  (E) Answer not known

139. The turning circle radius of outer rear wheel is expressed by ———————, where
  a → wheel track
  b → wheel base
  c → distance between pivots
  Q → angle of inside lock
  ϕ → angle of outside lock

  (A) $\dfrac{b}{Sin\theta} - \left[\dfrac{a-c}{2}\right]$

  (B) $\dfrac{b}{Sin\phi} + \left[\dfrac{a-c}{2}\right]$

  (C) $\dfrac{b}{\tan\theta} - \left[\dfrac{a-c}{2}\right]$

  (D) $\dfrac{b}{\tan\phi} + \left[\dfrac{a-c}{2}\right]$

  (E) Answer not known

140. Stub axle may be

    (A)   Dropped type

    (B)   Elliot type ✓

    (C)   Three quarter floating type

    (D)   Fully floating cars

    (E)   Answer not known

141. Transfer case is employed for

    (A)   Six wheel drive vehicles

    (B)   Four wheel drive vehicles ✓

    (C)   Multi axle vehicles

    (D)   Passenger cars

    (E)   Answer not known

142. Pre combustion chamber engines produce

    (A)   High mean effective pressures

    (B)   Low mean effective pressures ✓

    (C)   Moderate mean effective pressures

    (D)   Very high mean effective pressures

    (E)   Answer not known

143. A multigrade oil such as sae low-30 means that the oil has properties of

    (A)   10 viscosity at hot and 30 viscosity at cold

    (B)   10 viscosity at cold and 30 viscosity at hot

    (C)   10 viscosity at both hot and cold

    (D)   30 viscosity at both hot and cold

    (E)   Answer not known

144. The type of lubricating system generally adopted in two-stroke petrol engine, like scooters and motor cycles

    (A)   Dry sump lubrication system

    (B)   Pressure lubrication system

    (C)   Petrol lubrication system

    (D)   Splash lubrication system

    (E)   Answer not known

145. The radiator cap contains two valves these are the

    (A)   Pressure valve and by pass valve

    (B)   Atmospheric valve and vacuum valve

    (C)   Pressure valve and vacuum valve

    (D)   By pass valve and connector valve

    (E)   Answer not known

146. The example for the variable venturi carburettor is

    (A) Carter carburettor   (B) Solex carburettor

    (C) S.U. carburettor   (D) Zeraitte carburettor

    (E) Answer not known

147. In the variable venturi carburettor, the position of venturi valves is controlled by

    (A) Slow idle cam   (B) Fast idle cam

    (C) Venturi Vacuum   (D) Intake manifold vacuum

    (E) Answer not known

148. Hot - Idlong condition causes

    (A) Shutting - off fuel supply

    (B) Shutting - off air supply

    (C) Excessively enriching the mixture

    (D) Excessively leaning the mixture

    (E) Answer not known

149. The size of the diesel droplet after atorraization process is in the range of

    (A) 20 -100 microns   (B) 100 - 500 microns

    (C) 10 - 20 microns   (D) 5 - 10 microns

    (E) Answer not known

150. Number '1' is assigned to start of compression in the PV diagram of a theoretical Dual cycle. Heat supplied process is given by

    (A) Process 1-2   (B) Process 2-3

    (C) Process 2-3 and process 3-4   (D) Process 2-3 and process 4-5

    (E) Answer not known

151. Which of the following causes the photochemical smog?

(A) Excess O_2

(B) CO and CO_2

(C) Soot and particulate Matter

(D) NO_x and HC

(E) Answer not known

152. Order of affinity towards Soot formation in the premiered flame is

(A) Alcohols < Parafins < Olefins < Acetylene

(B) Aromatics < Parafins < Olefins < Acetylene

(C) Aromatics < Olefins < Parafins < Acetylene

(D) Acetylene < Olefins < Parafins < Aromatics

(E) Answer not known

153. In, flame Ionization Detector the inert gas used is

(A) Argon

(B) Neon

(C) Helium

(D) Nitrogen

(E) Answer not known

154. Synthetic way of generating test data sets, to evaluate the exhaust gas emissin content in laborious environment to certify the vehicle emission compliances. This is attained by

(A) Fuel consumption analysis

(B) Crash test

(C) Product life cycle

(D) Drive cycle analysis

(E) Answer not known

155. Smoke emission is controlled by

    (A) Adding lead with fuel

    (B) Fumigation ✓

    (C) Low pressure injection

    (D) High engine load

    (E) Answer not known

156. Newer catalytic convertors contain a base metal called

    (A) Rhodium

    (B) Silver

    (C) Cerium ✓

    (D) Copper

    (E) Answer not known

157. In SI engines flame quenching ———— can be minimized by

    (A) Increasing the surface to volume ratio

    (B) Reducing the squish area ✓

    (C) Increasing the compression ratio

    (D) Exhaust gas recirculation

    (E) Answer not known

158. Evaporative emission in SI engines accounts for the emission of

    (A) 50% CO

    (B) 50% HC

    (C) 20% CO

    (D) 25% HC ✓

    (E) Answer not known

159. BS-III emission norms for 4-wheeles for entire country in India was introduced in the year

   (A) 2000
   (B) 2005
   (C) 2010
   (D) 2015
   (E) Answer not known

160. Platinum and Rhodium promote two oxidation of

   (A) CO and HC
   (B) CO and NO_x
   (C) CO
   (D) HC and NO_x
   (E) Answer not known

161. According to BS – VI emission standards, the sulphur content of diesel is less than

   (A) 30 ppm
   (B) 50 ppm
   (C) 10 ppm
   (D) 100 ppm
   (E) Answer not known

162. Which one of the following reason is not contributing HC formation in SI engine?

   (A) Exhaust valve leakage
   (B) Flame quenching in crevices
   (C) Misfired combustion
   (D) Impingement of fuel spray
   (E) Answer not known

163. The responses time of zirconium dioxide type oxygen sensor ranger from

    (A)   5 to 10 ms

    (B)   15 to 30 ms

    (C)   35 to 50 ms

    (D)   55 to 70 ms

    (E)   Answer not known

164. Increasing a proportion gain will

    (A)   Increase the overshoot, decrease the steady state error

    (B)   Decrease the overshoot, increase the steady state error

    (C)   Increase the overshoot, increase the steady state error

    (D)   Decrease the overshoot, decrease the steady state error

    (E)   Answer not known..

165. Choosing a PI controlles to stabilise a control system means choosing the value of K_p and K_i, such that

    (A)   There is no overshoot

    (B)   The steady state error is zero

    (C)   The closed-loop characteristic equation has roots on the real axis

    (D)   The closed-loop characteristic equation has roots in the LHP.

    (E)   Answer not known

166. Emissions of HC, CO and NO_x in SI engines are relatively low for

    (A) $\lambda = 0$

    (B) $\lambda = 1$

    (C) $\lambda = 2$

    (D) $\lambda = 3$

    (E)   Answer not known

167. Choose the correct answers :

    (1) Active suspension controls both the springing an damping functions.

    (2) Active suspension control is useful for enhancing safety and comfort while towing heavy vehicles

    (3) Damping element is set to concentrate on wheel movements.

    (A) (1) Only   (B) Both (1) and (2)

    (C) (2) Only   (D) (1), (2) and (3) ✓

    (E) Answer not known

168. Preview control system is required for the following

    (A) Active suspension control ✓   (B) Emission control

    (C) Traction control   (D) Yaw stability control

    (E) Answer not known

169. The damping ratio of over-damped system is _____.

    (A) Equal to 1   (B) Equal to 0

    (C) Less than 1   (D) Greater than 1 ✓

    (E) Answer not known

170. The dynamic performance of the lambda control is strongly restricted by

_____.

    (A) $\Delta\lambda_g < 10\%$ (B) $\Delta\lambda_g > 10\%$

    (C) $\Delta\lambda_g < 3\%$ ✓   (D) $\Delta\lambda_g > 3\%$

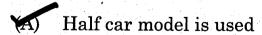   (E) Answer not known

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[Turn over

171. What are the pole, P, and Zero, Z, of the transfer function $G(S)=\dfrac{S+2}{S+3}$

    (A)   P = 2, Z = 3

    (B)   P = 3, Z = 2

    (C)   P = –2, Z = 3

    (D)   P = –3, Z = –2

    (E)   Answer not known

172. In an engine control system if λ=1.0, N_{ox}, Co and HC conversion efficiency will be _____. If λ>1, then _____ decreases and _____ increases.

    (A)   minimum, N_{ox} and HC

    (B)   maximum, HC and N_{ox}

    (C)   maximum, N_{ox} and HC

    (D)   minimum, HC and N_{ox}

    (E)   Answer not known

173. To Examine and Optimize the roll vibration of a Vehicle

    (A)   Half car model is used

    (B)   Quarter car model is used

    (C)   Full car model is used

    (D)   No such models used

    (E)   Answer not known

174. In an unstable motion of a vehicle, For a negative damping Ratio,

    (A) The Amplitude Decreases with time

    (B) The Amplitude Increases with time

    (C) Become Stable

    (D) There is no Negative Damping ratio

    (E) Answer not known

175. A passenger car has weight of 20 KN, and wheel base 3.0m, the weight distribution of front and near axle are 55 and 45% respectively. Determine the characteristic speed for under steer co-efficient of the car is 0.02.

    (A) 37.45 m/s   (B) 39.5 m/s

    (C) 38.3 m/s   (D) 39.8 m/s

    (E) Answer not known

176. A Vehicle will have over steer characteristics when

    (A) Slip angle of front wheels more than rear wheel

    (B) Slip angle of rear wheels more than front wheel

    (C) Side slip angle is high

    (D) Front axle weight is higher than rear axle

    (E) Answer not known

177. There are Three forces and Three moments acting on the Tyre from the ground, They are

    (A) Rolling force, Overturning force, Aligning force and Tractive moment, Lateral moment, Normal moment

    (B) Tractive Force, Lateral Force, Normal Force and Overturning Moment, Rolling Resistance Moment and Aligning Torque moment

    (C) Camber Force, Contact Force, Slip Force and Carcass Moment, Sidewall Moment, Bead Moment.

    (D) Torque Force, Drag Force, Driving Force and Hysteresis Moment, Rolling Resistance Moment, Overturning Moment

    (E) Answer not known

178. The degree of freedom of a system denotes the _____ no of independent _____ necessary to describe the position of all parts of the system at any instant of time.

(A) Minimum, Linear displacement

(B) Minimum, Coordinates

(C) Maximum, Coordinates

(D) Maximum, Linear displacement

(E) Answer not known

179. For an under Damped Harmonic Oscillator, Resonance

(A) Occurs when excitation frequency is greater than undamped natural frequency

(B) Occurs when excitation frequency is less than undamped natural frequency

(C) Occurs when excitation frequency is equal to undamped natural frequency

(D) Never occur

(E) Answer not known

180. A _____ is an Auxillary mass spring system that is attached to a machine that is experiencing large amplitude vibrations due to near-resonance conditions.

(A) Non-linear vibrations

(B) Random vibrations

(C) Free vibrations

(D) Vibration absorber

(E) Answer not known

181. Consider three springs with stiffness $K_1 = 20$ N/m; $K_2 = 50$ N/m; $K_3 = 100$ N/m. The equivalent spring stiffness when three spring are in series is _____ N/m and when three springs are in parallel is _____ N/m.

   (A)   170 and 0.08

   (B)   0.08 and 170

   (C)   12.5 and 170

   (D)   170 and 12.5

   (E)   Answer not known

182. The damping capacity of suspension damper is varied continuously in case of

   (A)   Torsion bar suspension

   (B)   Coil spring suspension

   (C)   Semi-active suspension system

   (D)   Active suspension system

   (E)   Answer not known

183. Strain gauge type sensors are used to measure

   (A)   rpm

   (B)   torque

   (C)   temperature

   (D)   flow rate

   (E)   Answer not known

184. Which of the following statements are correct about AC generator?

1. The stator is a rotating magnetic field inside the alternator.

2. Increasing field current through the coil increases the strength of the magnetic field.

(A) 1 and 2 correct

(B) 1 and 2 incorrect

(C) 1 only correct

(D) 2 only correct

(E) Answer not known

185. The purpose of the pull-in winding in the operating solenoid of a pre-engaged starter motor is to

(A) Hold the pinion in mesh

(B) Pull the pinion out of mesh

(C) Hold the pinion out of mesh

(D) Pull the pinion in to mesh

(E) Answer not known

186. A voltmeter is connected between the main starter terminal and earth. On cranking the engine, the reading should be

(A) No more than 0.5 v below battery voltage

(B) Approximately 0.5 v above battery voltage

(C) The same as battery voltage

(D) More than battery voltage

(E) Answer not known

187. The ignition coil is a

 (A) Voltage distributor

 (B) Step up transformer ✓

 (C) Step down transformer

 (D) Current Amplifier

 (E) Answer not known

188. As the engine speed increases, the spark timing should be

 (A) Retarded

 (B) Advanced ✓

 (C) Kept constant

 (D) after TDC

 (E) Answer not known

189. Match the following :

 (a) Ignition coil   1. Connects ignition coil to battery
 (b) Ignition Distributor   2. To ignite the compressed Air fuel mixture

 (c) Ignition switch   3. A Fast acting switch, to open and close the current flow to the coil

 (d) Battery   4. To raise the battery voltage to a high voltage

                             5. Supplies current to the ignition system

	(a)	(b)	(c)	(d)
(A)	4	3	1	2
(B)	3	4	5	1
(C) ✓	4	3	1	5
(D)	3	4	5	2
(E)	Answer not known			

190. The most widely used battery in automobile is

    (A)   Alkaline battery

    (B)   Lead acid battery

    (C)   Lithium – Ion battery

    (D)   Zinc–air battery

    (E)   Answer not known

191. The duration of a high rate discharge test should not exceed about

    (A)   10 Seconds

    (B)   30 Seconds

    (C)   50 Seconds

    (D)   70 Seconds

    (E)   Answer not known

192. Match the following :

(a) Hydrometer	1.	To determine the load to be placed on the battery
(b) Charge Indicator	2.	To measure the terminal voltage of a battery
(c) Battery Load tester	3.	State of charge for a vent cap battery
	4.	State of charge for a maintenance free battery

	(a)	(b)	(c)
(A)	4	3	1
(B)	4	3	2
(C)	3	4	2
(D)	3	4	1
(E)	Answer not known		

193. When the sungear is held and the planet carrier is turned, the epicyclic gear train provides

    (A) Speed reduction
    (B) Speed increase
    (C) Direct drive
    (D) Reverse
    (E) Answer not known

194. In torque converter, the torque multiplication is achieved by using

    (A) Pump
    (B) Turbine
    (C) Stator
    (D) Impeller
    (E) Answer not known

195. In a sliding mesh gear box, the following is valid when the transmission is neutral

    (A) Only the clutch shaft gear is connected to the counter shaft gear
    (B) Only the clutch shaft gear is connected to the main shaft gear
    (C) Only the clutch shaft gear is connected to idler gear
    (D) Only the main shaft gear is connected to idler gear
    (E) Answer not known

196. Two advantages of using helical gears rather than spur gears in a transmission are

    (A) Strength and cost
    (B) Strength and less end thrust
    (C) Noise level and strength
    (D) Noise level and economy
    (E) Answer not known

197. The part of a clutch assembly which hold's the pressure plate against the clutch plate is

    (A)   Release lever

    (B)   Strut's

    (C)   Spring's ✓

    (D)   Thrust bearing's

    (E)   Answer not known

198. Type of clutch is used in motor cycles

    (A)   Single plate clutch

    (B)   Multiplate clutch ✓

    (C)   Cone clutch

    (D)   Semi - centrifugal clutch

    (E)   Answer not known

199. For multiplate friction clutch with 'n' plates, the number of active surfaces 'n_a' for transmission power is

    (A) $n_a = 2n$

    (B) $n_a = (n - 1)$ ✓

    (C) $n_a = (2n - 1)$

    (D) $n_a = 2(n - 1)$

    (E)   Answer not known

200. The clutch plate is hold in between _____ and pressure plate

    (A)   flywheel ✓

    (B)   gear box

    (C)   engine

    (D)   propeller shaft

    (E)   Answer not known

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