OPSC
MVI
Previous Year Paper
(Mechanical Engg) 2018

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Test Booklet Series

A

TEST BOOKLET

T. B. C. : MVI – II – 17/18

1421

INSPECTOR OF MOTOR VEHICLE/
ADDITIONAL R. T. O (ENFORCEMENT)/
ASSISTANT WORKS ENGINEER

Serial No. _____

(MECHANICAL ENGINEERING)

Time Allowed : 1½ Hours

Maximum Marks : 100

: INSTRUCTIONS TO CANDIDATES :

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET OF THE SAME SERIES ISSUED TO YOU.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D**, AS THE CASE MAY BE, IN THE APPROPRIATE PLACE IN THE ANSWER SHEET USING BALL POINT PEN (BLUE OR BLACK).
3. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. DO NOT write *anything else* on the Test Booklet.
4. **YOU ARE REQUIRED TO FILL UP & DARKEN ROLL NO., TEST BOOKLET / QUESTION BOOKLET SERIES IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET / QUESTION BOOKLET SERIES AND SERIAL NO. AND ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.**
5. This Test Booklet contains **100** items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question).
6. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided by **using BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
7. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. **There will be negative marking for every wrong answer @ 0.25 mark.**
8. Before you proceed to mark (darken) in the Answer Sheet the responses to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions sent to you with your **Admission Certificate**.
9. After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *Answer Sheet* issued to you. You are allowed to take with you the candidate's copy / second page of the Answer Sheet along with the **Test Booklet**, after completion of the examination, for your reference.
10. Sheets for rough work are appended in the Test Booklet at the end.

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SEAL

1. Which of the following arrangement in an automobile engine change the reciprocating motion to rotary motion ?
   (A) Crank shaft and a camshaft
   (B) Pistons and connecting rods
   (C) Connecting rods and a crankshaft
   (D) Camshaft and rocker arms

2. The swept volume of a piston with 0.1 m diameter 0.4 m length will be :
   (A) $0.003\ m^3$
   (B) $0.03\ m^3$
   (C) $0.3\ m^3$
   (D) $3\ m^3$

3. The "firing order" of an engine is the :
   (A) Order in which the cylinders are numbered
   (B) Order in which pistons are arranged
   (C) Order in which the cylinders deliver their power stroke
   (D) Standard arrangement which can be altered by changing the crankshaft

4. A gasoline that detonates easily is called as :
   (A) High-octane gasoline
   (B) Low-octane gasoline
   (C) Unleaded gasoline
   (D) Blended fuel

5. When the last part of air-fuel mixture explodes before being ignited by flame travelling from the spark plug, the effect is known as :
   (A) Detonation
   (B) Preignition
   (C) Stalling
   (D) Vaporization

6. The portion of carburetor that reduces pressure to allow fuel flow, is called as :
   (A) Air bleed
   (B) Fuel nozzle
   (C) Venturi
   (D) Throttle valve

7. Which ONE of the following statements is correct ?
   (A) Diesel engines have throttle valves to restrict air flow
   (B) The power and speed of the diesel engine are controlled, in part by the spark advance
   (C) Diesel engines have lower compression ratios than spark-ignition engines
   (D) Diesel engines compress only air in the compression stroke

8. In the diesel engine, the fuel is injected into the cylinder :
   (A) At the end of power stroke
   (B) Towards the end of compression stroke
   (C) At the beginning of power stroke
   (D) At the end of exhaust stroke

9. Combustion in CI engine cycle takes place in :

(A) Isentropic process

(B) Isochoric process

(C) Isobaric process

(D) Isothermal process

10. For the same compression ratio and initial conditions for Diesel and Otto cycle which of the following statement is true for air standard efficiency :

(A) Diesel cycle efficiency is higher

(B) Diesel and Otto cycle efficiencies are same

(C) Otto cycle efficiency is higher

(D) Can't conclude from this

11. Which fuel has higher Octane number ?

(A) Petrol

(B) Diesel

(C) Bio-diesel

(D) Bio-gas

12. Stoichiometric burning of the hydrocarbon fuel in air leads to product as :

(A) CO, H_2O, O_2, N_2

(B) CO_2, H_2O, N_2

(C) CO, O_2, N_2

(D) H_2O, O_2, N_2

13. Major constituent of Natural gas is :

(A) Ethane

(B) Hydrogen

(C) Methane

(D) Carbon monoxide

14. With reference to Cartesian coordinate frame x – y – z, stresses at a point in a loaded body are σ_x = 10 MPa, $\sigma_2 = 5$ MPa, $\sigma_y = \tau_{xy} = \tau_{yz} = \tau_{zx} = 0$. The maximum shear stress at that point in MPa is :

(A) 2.5

(B) 5

(C) 7.5

(D) 0

15. In a beam of length 'L', the bending moment at any $x(0 < x < L)$ is $M(x) = 5x + 10$ N – m. Shear force at a section x = 2 m is :

(A) 10 N

(B) 5 N

(C) – 10 N

(D) 0

16. A square cross section (b × b) cantilever beam with length L is subjected to point load P at the free end. The maximum bending stress induced is :

(A) $\frac{6PL}{b^3}$

(B) $\frac{6PL}{b^2}$

(C) $\frac{3PL}{b^3}$

(D) $\frac{3PL}{b^2}$

17. A metallic rod of length 1 m and diameter 1 cm is subjected to uniaxial tensile force of 2000 kN results in an increase in length of 1 mm and a reduction in diameter of 0.0028 mm. The Poisson's ratio is :

(A) 0.28

(B) 0.3

(C) 0.25

(D) 0.33

18. A circular shaft of diameter 'd' is subjected to torque 'T'. Maximum shear stress induced is :

(A) $\frac{32T}{\pi d^3}$

(B) $\frac{16T}{\pi d^3}$

(C) $\frac{16T}{\pi d^2}$

(D) $\frac{32T}{\pi d^2}$

19. A thin walled cylinder closed at ends is filled with fluids to a gauge pressure 'p'. If 'd' and 't' are the diameter of the cylinder and the thickness of the Wall, the maximum normal stress induced in the wall of the cylinder is :

(A) $\frac{pd}{2t}$

(B) $\frac{pd}{4t}$

(C) $\frac{pd}{8t}$

(D) $\frac{pd}{16t}$

20. The ratio of buckling load for a long column pinned at both ends to the buckling load for the same column if the ends are fixed is :

(A) 1/2

(B) 1/3

(C) 1/4

(D) 1/5

21. For a uniform circular cross section rod subjected to uniaxial tensile load P, the strain energy stored is E. If the load is reduced to P/2, the strain energy stored will be :

(A) E/2

(B) E/4

(C) E/8

(D) E/16

22. Two closely coiled helical springs 'S1' and 'S2' are identical in all respects but the number of active turns of spring 'S1' is half that of spring 'S2'. The ratio of deflections in spring 'S1' to that in spring 'S2' is :

(A) 1/2

(B) 2

(C) 4

(D) 8

23. At the neutral axis of a cross section of a beam subjected to bending the bending stress is :

(A) Minimum

(B) Zero

(C) Maximum

(D) Compressive

24. On the principal planes the shear stress :

(A) Is zero

(B) Is not zero and is minimum

(C) Is not zero and is maximum

(D) May or may not be zero

25. When a preload only is applied to the bolted joint then the force developed in bolt is :

(A) Tensile force

(B) Shear force

(C) Compressive force

(D) Transverse force

26. The margin in a rivet joint is the distance between :

(A) The edge of the plate to the center of the any rivet

(B) The center of one rivet to the center of the adjacent rivet in the same row

(C) Two consecutive rows of rivets in the same plate

(D) The edge of the plate to the center of the rivet that is close to the edge

27. The design of transverse fillet welds is primarily based on maximum :

(A) Tensile stresses in the throat

(B) Compressive stresses in the throat

(C) Shear stress in the throat

(D) Stresses acting at both the legs of the weld

28. If the external tensile force acts on a preloaded bolted joint then :

(A) The clamping force increases with increase in tensile force

(B) The clamping force decrease with increase in tensile force

(C) The clamping force remains constant at a non-zero value irrespective of changes in tensile force

(D) The clamping force is always zero for any changes in tensile force

29. The condition for both the infinite fatigue life and no first cycle yielding can definitely be achieved if one uses :

(A) The Soderberg line

(B) The Goodman or modified Goodman line

(C) Yield line

(D) The Gerber line

30. If q is the notch sensitivity factor, K_t is the theoretical stress concentration factor and K_f is the fatigue stress concentration factor then for a material that is fully sensitive to the notches under fatigue loads :

(A) $q = 1$ and $K_f = 1$

(B) $q = 1$ and $K_f = K_t$

(C) $q = 0$ and $K_f = 1$

(D) $q = 1$ and $K_t = 1$

31. The stress concentration occurs in a power transmitting stepped shaft :

(A) Only at the keyways

(B) Only at the fillets at the shoulders

(C) Only at both the ends of shaft

(D) At both the keyways and fillets

32. If N_a is the active number of coils, N_t is the total number of coils and d is the diameter of wire of the coils of a helical compression spring then the solid length is defined as :

(A) $N_t/N_a d$

(B) $N_a d$

(C) $(N_t+N_a)d$

(D) $N_t d$

33. In which of the following power transmission elements, high frictional forces developed on surface due to wedge action are responsible for the transmission of power ?

(A) Gear drives

(B) Flat belts

(C) V-belts

(D) Chain drives

34. Which of the following statement is true with reference to a power transmission shaft carrying Herringbone gear :

(A) Only the right hand side teeth subjected to axial forces

(B) Only the left hand side teeth subjected to axial forces

(C) The net axial force that act on the bearing is zero

(D) Transmits very low power

35. A static fluid can have :

(A) Non zero normal and shear stresses

(B) Positive normal stress and zero shear stress

(C) Zero normal stress and non-zero shear stress

(D) Negative normal stress and zero shear stress

36. If 'x' is the distance measured from the leading edge of a flat plate, then laminar boundary layer thickness varies as :

(A) $1/x$

(B) $x^{4/5}$

(C) $x^{\frac{1}{2}}$

(D) x^{2}

37. Cavitation in a hydraulic reaction turbine is most likely to occur at the turbine :

(A) Entry

(B) Exit

(C) Stator exit

(D) Rotor exit

38. The parameters which determines the friction factor for turbulent flow in a rough pipe are :

(A) Froude number and Mach number

(B) Froude number and relative roughness

(C) Mach number and relatives roughness

(D) Reynolds number and relatives roughness

39. For a floating body, if the center of gravity, centre of buoyancy and the metacentre, are respectively at point G, B and M, then for stable equilibrium of the body :

(A) GM > BM

(B) BM > BG

(C) BM < BG

(D) BM = 0

40. A Pelton wheel is an :

(A) Inward flow impulse turbine

(B) Axial flow impulse turbine

(C) Outward flow impulse turbine

(D) Inward flow reaction turbine

41. In case of a one dimensional heat conduction in a medium with constant properties, T is the temperature at position x at time t, then $\partial T/\partial t$ is proportional to :

(A) T/x

(B) $\partial T/\partial x$

(C) $\partial^2 T/\partial x \partial t$

(D) $\partial^2 T/\partial x^2$

42. For laminar forced convection over a flat plate, if the free stream velocity increases by a factor 2, the average heat transfer coefficient :

(A) Remain same

(B) Decreases by a factor of $\sqrt{2}$

(C) Rises by a factor of $\sqrt{2}$

(D) Rises by a factor of 4

43. Biot number signifies the ratio of :

(A) Convective resistance in the fluid to the conductive resistance in the solid

(B) Conductive resistance in the fluid to the conductive resistance in the solid

(C) Inertia force to viscous force

(D) Buoyancy force to viscous force in the fluid

44. Environment friendly refrigerant R134 is used in the new generation domestic refrigerators. Its chemical formula is :

(A) $CHClF_2$

(B) $C_2Cl_2F_3$

(C) $C_2Cl_2F_4$

(D) $C_2H_2F_4$

45. Knocking tendency in SI engine reduces with increasing :

(A) Compression ratio

(B) Engine speed

(C) Wall temperature

(D) Supercharging

46. If a closed system is undergoing an irreversible process, the enthalpy of the system :

(A) Must increase

(B) Always remain constant

(C) Must decrease

(D) Can increase, decrease or remain constant

47. For a reversible adiabatic compression process in a steady flow process, the work transfer per unit mass is :

(A) $\int P dv$

(B) $\int v\, dP$

(C) $\int T ds$

(D) $\int s\, dT$

48. At the time of starting, idling and low speed operation, the carburettor supplies a mixture which is termed as :

(A) Lean

(B) Slightly leaner than stoichiometric

(C) Stoichiometric

(D) Rich

49. In a Diesel cycle, the ratio of the cylinder volumes after and before the combustion process is called :

(A) Back work ratio

(B) Work ratio

(C) Pressure ratio

(D) Cut-off ratio

50. A perfect gas at $27^{\circ}C$ was heated at constant pressure until its volume was doubled. The temperature of the gas will now be :

(A) $270^{\circ}C$

(B) $427^{\circ}C$

(C) $600^{\circ}C$

(D) $900^{\circ}C$

51. A heat engine operates on a Carnot cycle with an efficiency of 75%. The low temperature reservoir is at $0^{\circ}C$. Now, if a refrigerator operates on the same cycle, the COP of the refrigerator would be :

(A) 0.23

(B) 0.33

(C) 0.43

(D) 0.56

52. At what temperature do the Fahrenheit and Celsius scales coincide ?

(A) – 44

(B) – 40

(C) 44

(D) – 42

53. MacLeod Gauge works based on the principle of :

(A) Boyle's Law

(B) Euler's Law

(C) Idle Gas Law

(D) Dalton's Law

54. Bernoulli's equation is not valid within the hydrodynamic boundary layer due to :

(A) Viscous dissipation

(B) Compressible effect

(C) Temperature drop

(D) Pressure drop

55. When the air gets humidified, its density :

(A) Increases

(B) Decreases

(C) Remains the same

(D) Mainly depends on temperature

56. Thermoplastic material are those materials which :

(A) Are formed into shape under heat and pressure that results in a permanently hard product

(B) Do not become hard with the application of heat and pressure as well as no chemical change occurs

(C) Are flexible and can withstand considerable wear under suitable conditions

(D) Are used as a friction lining for clutches and brakes

57. A material is said to be allotropic, if it has :
(A) Fixed structure at all temperatures
(B) Atoms distributed in random pattern
(C) Different crystal structures at different temperatures
(D) Molecules distributed in random pattern

58. Hardness and tensile strength in austenitic stainless steel can be increased by :
(A) Hardening and cold working
(B) Normalising
(C) Martempering
(D) Full Annealing

59. The presence of hydrogen in steel causes :
(A) Corrosion resistance
(B) Improved weldability
(C) Embrittlement
(D) Reduced neutron absorption cross-section

60. Blast furnace is used to produce :
(A) Pig Iron
(B) Cast Iron
(C) Wrought Iron
(D) Steel

61. Monel metal is an alloy of :
(A) Nickel and copper
(B) Nickel and chromium
(C) Nickel, chromium and iron
(D) Copper and chromium

62. Shock resisting steels should have :
(A) Low wear resistance
(B) Low hardness
(C) Low tensile strength
(D) Toughness

63. The temperature point at which the change starts on heating the steel is called :
(A) Lower critical point
(B) Upper critical point
(C) Point of recalescence
(D) Point of decalescence

64. When medium carbon steel is heated to coarsening temperature :
(A) There is no change in grain size
(B) The average grain size is minimum
(C) The grain size increases very rapidly
(D) The grain size first increases and then decreases rapidly

65. Malleability is the property of a material by virtue of which a material :
(A) Regains its shape and size after the removal of external forces
(B) Retains the deformation produced under load permanently
(C) Can be drawn into wires with the application of a tensile force
(D) Can be rolled or hammered into thin sheets

66. Limestone in the charge of a blast furnance decomposes to give lime and carbon dioxide. The lime thuss obtained :

(A) Controls the grade of pig iron

(B) Acts as an iron-bearing mineral

(C) Supplies heat to reduce ore and melt the iron

(D) Forms a slag by combining with impurities

67. According to Indian standard specifications, SG400/15 means :

(A) Spheroidal graphite cast iron with B. H. N. 400 and minimum tensile strength 15MPa

(B) Spheroidal graphite cast iron with minimum tensile strength 400MPa and 15% elongation

(C) Spheroidal graphite cast iron with minimum compressive strength 400MPa and 15% reduction in area

(D) Spheroidal graphite cast iron with maximum tensile strength 400MPa and 15% reduction in area

68. Which pair of following statements is correct for orthogonal cutting using a single point cutting tool ?

P. Reduction in friction angle increase cutting forces

Q. Reduction in friction angle decreases cutting forces

R. Reduction in friction angle increases chip thickness

S. Reduction in friction angle decreases chip thickness

(A) P and R

(B) P and S

(C) Q and R

(D) Q and S

69. In a typical metal cutting operation, using a cutting tool of positive rake angle = 10^{o}, it was observed that the shear angle was 20^{o}. The friction angle is :

(A) 45^{o}

(B) 30^{o}

(C) 60^{o}

(D) 40^{o}

70. Material which on machining produces chips with built up edge is :

(A) Brittle materal

(B) Ductile material

(C) Ceramic material

(D) Hard material

71. In a single point turning operation of steel with a cemented carbide tool, Taylor's tool life exponent is 0.25. If cutting speed is halved, the tool life will increase by :

(A) Two times

(B) Four times

(C) Eight times

(D) Sixteen times

72. Small amount of which one of the following elements / pair of elements is added to steel to increase its machinability ?

(A) Nickel

(B) Sulphur and Phosphorus

(C) Silicon

(D) Manganese and Copper

73. In which one of the following machining manual part programming is done ?

(A) CNC machining

(B) NC machining

(C) DNC machining

(D) FMS machining

74. In a turning operation, peak to valley surface roughness is 32 μm. The R_a value will be approximately :

(A) 4 μm

(B) 8 μm

(C) 16 μm

(D) 32 μm

75. The mechanism of material removal in Electrochemical machining process is :

(A) Anodic dissolution

(B) Melting and Corrosion

(C) Erosion and Cavitation

(D) Cavitation and Evaporation

76. During ultrasonic machining, the metal removal is affected by the :

(A) High frequency eddy current

(B) Hammering action of abrasive particles

(C) High frequency sound waves

(D) Rubbing action between tool and workpiece

77. The condition in which the grinding wheel shines due to dull abrasive grains is called :

(A) Lapping

(B) Bearing

(C) Glazing

(D) Truing

78. Material after cold working are subjected to following process to relieve stresses :

(A) Annealing

(B) Hot working

(C) Tempering

(D) Normalizing

79. An operation of embossing a diamond shaped pattern on the surface of a workpiece is known as :

(A) Grooving

(B) Knurling

(C) Facing

(D) Counter-boring

80. G01 in CNC codes represents which one of the following :

(A) Rapid transverse

(B) Linear interpolation

(C) Circular interpolation

(D) Dwell

81. Break-even analysis can be applied to :

(A) Determine optimum order quantity

(B) Determine optimum demand quantity

(C) Compare two production methods

(D) Monitor progress of orders and report their status

82. Which of the following is independent of sales forecast ?

(A) Inventory management

(B) Master production scheduling

(C) Resource planning

(D) Productivity

83. The distinguishing feature of an LP model is :

(A) Relationship among all variables is linear

(B) Relationship among all variables is non-linear

(C) Relationship among all variables can be linear or non-linear

(D) Relationship among variables is unknown

84. Which of the following statements is true with respect to the optimal solution of an LP problem ?

(A) Every LP problem has an optimal solution

(B) Optimal solution of an LP problem always occurs at an extreme point

(C) If an optimal solution exists, then the solution space is bounded

(D) If an optimal solution exists, there will always be at least one at a corner

85. The method used to solve an assignment problem is called :

(A) Reduced matrix method

(B) Hungarian method

(C) MODI method

(D) VAM method

86. A calling population is considered to be infinite when :

(A) Capacity of the system is infinite

(B) Arrivals are dependent upon each other

(C) All customers arrival at once

(D) Arrivals are independent of each other

87. Which of the following is not an objective of scheduling ?

(A) Maximize machine utilization

(B) Minimize job completion time

(C) Minimize job lateness

(D) Maximize job quality

88. The coefficient of friction between a block of weight 100N and the flat surface on which it is resting is 0.2. If a force of 15N acts on the block parallel to the surface, the magnitude of the friction force is :

(A) 0

(B) 15 N

(C) 20 N

(D) 30 N

89. If a block is sliding with a linear velocity of 5 m/s on a bar which is rotating with an angular speed of 1 rad/s, then the Coriolis acceleration is :

(A) $5\ m/s^2$

(B) $7\ m/s^2$

(C) $10\ m/s^2$

(D) $20\ m/s^2$

90. In the single plane balancing of a rotating machine, if an unbalanced mass of 4 gm is found at a radius of 10 cm, to balance the system a mass of 5 gm should be placed at a radial distance of :

(A) 2 cm

(B) 4 cm

(C) 8 cm

(D) 15 cm

91. The number of instantaneous centre of velocity in a plannar 4 bar mechanism with all revolute joints is :

(A) 4

(B) 6

(C) 8

(D) 10

92. A flywheel gives up 302 kJ in changing its angular speed from 152 rad/s to 150 rad/s. The moment of inertia of the flywheel is :

(A) $5612\ kg\text{-}m^2$

(B) $6212\ kg\text{-}m^2$

(C) $1000\ kg\text{-}m^2$

(D) $9231\ kg\text{-}m^2$

93. In a simple gear train speed ratio depends :

(A) Only on the number of teeth on driving and driven gears

(B) On the number of teeth on idlers

(C) On the diameter of intermediate gears

(D) On the number of teeth of driver, driven and idler gears

94. A gear with infinite radius is known as :

(A) Pinion

(B) Rack

(C) Worm

(D) Fillet

95. The shape of a cable carrying a load uniformly distributed along the cable itself is :

(A) Linear

(B) Parabolic

(C) Sinusoidal

(D) Catenary

96. The module in a pair of spur gears with 20 and 40 teeth and 5 mm pitch circle radius of the pinion is :

(A) 0.25 mm

(B) 0.5 mm

(C) 1 mm

(D) 2 mm

97. A vehicle which is modelled as a single degree of freedom spring mass damper system while moving on a harmonically varying undulated road, the transmissibility will be "1" when the ratio of the frequency of the force due to road undulation to the natural frequency of the system is equal to :

(A) $1 / \sqrt{2}$

(B) 1

(C) $\sqrt{2}$

(D) $2\sqrt{2}$

98. When a four wheeler, moving forward at a speed above critical takes a turn to the right the wheel(s) that tends to leave the ground is :

(A) Outer front wheel

(B) Both the inner wheels

(C) Rear two wheels

(D) Outer two wheels

99. In a locomotive where the primary forces are partially balanced, the maximum magnitude of the unbalanced force along the perpendicular to the line of stroke is known as :

(A) Hammer blow

(B) Swaying couple

(C) Tractive effort

(D) Hunting

100. A connecting rod of length 30 cm between crank pin and gudgeon pin centers has a radius of gyration of $5\sqrt{3}$ cm. For the dynamic equivalent system of the connecting rod, if the first mass is placed at a distance 25 cm from the center of mass of the connecting rod, the distance of the second mass from the center of mass in cm will be :

(A) $\sqrt{3}$

(B) 3

(C) $2\sqrt{3}$

(D) 8

SPACE FOR ROUGH WORK

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