Questions for FB25

Parv Jain

*correct answers in bold.

1. **The front hoop requires _____ attachment points, _____ on each side connecting to the front bulkhead support structures and _____ connecting to the front hoop bracing.**
   A) four, one, two
   B) five, two , one
   C) three, one , one
   D) six , two, two

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2. **Find the CORRECT statement in case your vehicle goes off course:**
   A) An OC occurs when the vehicle has two or more wheels outside the course boundary as indicated by edge marking.
   B) When an OC occurs, the driver must look for a red-yellow striped flag and then re-enter the track at the next possible point .
   C) When re-entering the driver needs to wait for a blue flag from track marshals.
   D) **Missing one or more gates of a given slalom at autocross or endurance is counted as one OC per occurrence.**

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3. **Find the CORRECT definition:**
   A) Main hoop – A roll bar located above the driver's legs, in proximity to the steering wheel.
   B) Front bulkhead – A conical structure that defines the forward plane of the chassis and provides protection for the driver's feet (in front view, together with the AIP, covers the driver's feet).
   C) Front bulkhead support (FBHS)– A structure that defines the side of the chassis from front bulkhead back to the top of the upper side impact structure and the main hoop.
   D) Chassis member – A minimum representative single piece of uncut, continuous tubing or equivalent structure.

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4. Alternative materials may be used for all parts of the primary structure and the tractive system accumulator container with the following exceptions:
   A) Option1 :The roll hoops must be aluminium welded structures.

B) Option2 : Any welded structures of the primary structure must be steel.

C) Option3 :The front hoop and the front hoop bracing must be steel.

D) Both Option1 and Option2.

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5. Find the INCORRECT statement regarding main hoop:

A) The main hoop must be constructed of a single piece of uncut, continuous, closed section steel tubing.

B) In the side view the portion of the main hoop which is above its upper attachment point to the side impact structure must be inclined less than 10° from vertical.

C) In the side view any bends in the main hoop above its upper attachment point to the primary structure must be braced to a node of the main hoop bracing support structure with tubing meeting the requirements of main hoop bracing.

D) In the side view any portion lower than the upper attachment point to the side impact structure must be inclined either rearward or not more than 10° forward.

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6. (Q) In the Cost and Manufacturing event a team score of BOM discussion without penalties is seven, they have missed a part , material specifications for four items and process for three items, they scored fifteen in real case discussion, and got two thirds of the remaining marks, what is their cost scoring rounded off to ones place if they are non-finalists and highest scoring non-finalist got seventy two as their score?

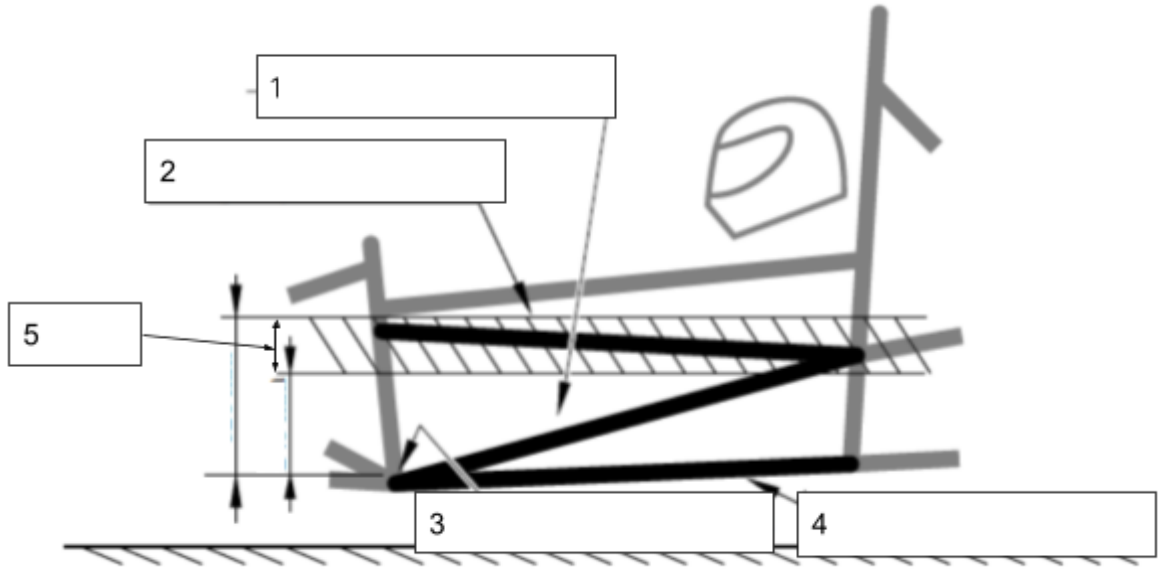
A) 45

B) 42

C) 53

D) 50

7. Determine the indicated parts in order: (SI = Side Impact)



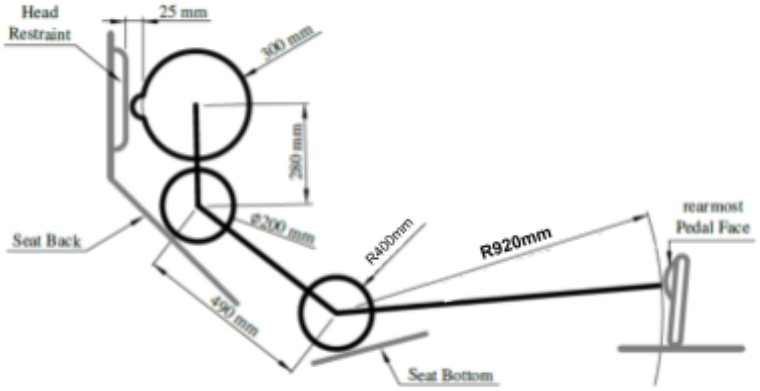
A) 1:Diagonal SI member 2:Upper SI member 4:Lower SI member 5: 80mm

B) 1:Diagonal SI member 2:Lower SI member 3:Lowest point in cockpit 5: 80mm

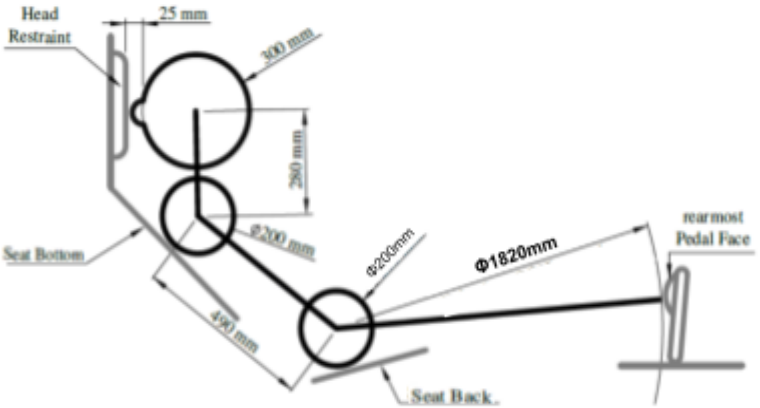
C) 1:Diagonal SI member 2:Lowest point in cockpit 4:Lower SI member 5: 80mm

D) 1:Diagonal SI member 3:Lower SI member 4:Lowest point in cockpit 5: 80mm

8. **Which of the following specifications are legitimate with respect to FB25?**

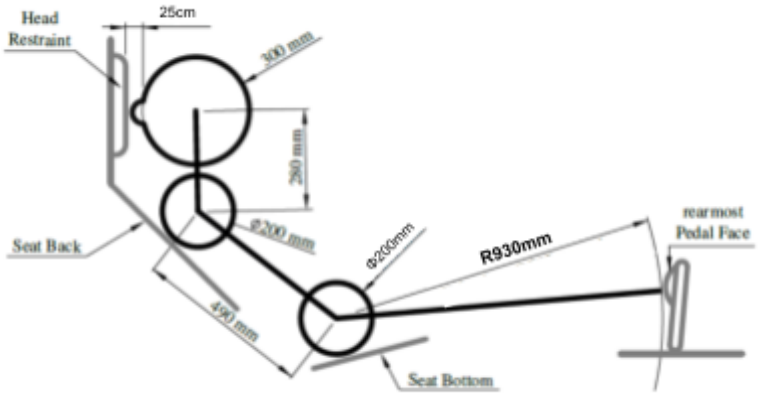


A) **Driverless**

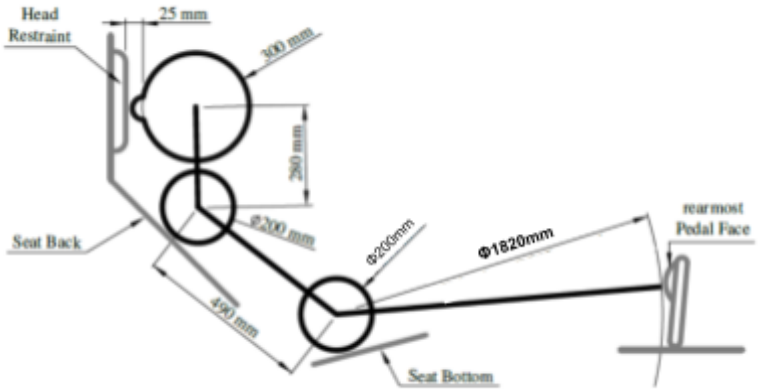


Driverless

B)



C)



D) Driverless

Correct: D

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9. **(Q) Your car has three accumulator segments with 83.33% of the maximum static voltage cap in each. Also, the TS current is 10 Amp at the beginning . Both the TS Voltage and the TS Current vary by a factor of $e^{-\frac{t}{2\times10^4}}$ as described by the data logger. Suppose your car completes the endurance test in 33 minutes and 20 seconds. If the lowest efficiency factor is $8 \times 10^6\ MJ\ sec^2$,find the efficiency score of your team. Given regenerated energy by the car is 3MJ.**
   - **A) 30**
   - B) 32
   - C) 34
   - D) 28

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10. **(Q) Your team participates in the skid pad event , your car's average speed over Left circle in run 1 is 5.60 m/sec and in run 2 is 5.99 m/sec. Whereas the latter over the right circle in run 1 is 5.63 m/sec and in run 2 is 5.64 m/sec . If the fastest car took on average 8 seconds. What is your team's final score? Take Inner radius.**
    - **A) 63.19**
    - B) 59.44
    - C) 66.32
    - D) 58.14

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11. During the brake test, your driver fails to lock the wheels, but the vehicle comes to a complete stop.
    After analysing the results you have the following data: Vehicle speed before braking point: 54 km/h Distance between braking point and complete stop: 15 m, Time between braking point and complete stop: 2s

Resultant force during braking: 1350 N What is the mass of your vehicle?

A. 180 kg
B. 200 kg
C. 190 kg
D. 160 kg