

These are sample MCQs to indicate pattern, may or may not appear in examination

University of Mumbai

Online Examination 2020

Program: BE Automobile Engineering

Curriculum Scheme: Revised 2016

Examination: Final Year Semester VIII

Course Code: AEC802 and Course Name: Vehicle Dynamics

Time: 1hour

Max. Marks: 50

Note to the students:- All the Questions carry equal marks .

- Q The deck lid spoiler
A reduces rear lift
B increases rear lift
C produces no change in lift
D Reduces Drag
- Q the shallow angles of wind shield leads to
A increase in solar heating
B decrease in solar heating
C no change in solar heating
D increase or decrease solar heating
- with increase in temperature of the tire the rolling resistance coefficient of
Q the tire will
A increases
B decreases
C no change
D no dependency
- Q The protuberance drag is due to
A front shield
B roof
C drip rail
D bonnet
- Q The deck lid spoiler

- A reduces drag
B increases drag
C produces no change in drag
D none of the above
- The flow blocking surfaces installed at the perimeter of the radiator, to improve flow through radiator at low vehicle speed is called as
- A Car head
B Radiator
C Air blocker
D Air dams
- Q For compressible flow which equation is used
- A Bernoullis equation
B Euler's equation
C Newtons equation
D flow equation
- Q For incompressible flow which equation is used
- A Bernoullis equation
B Euler's equation
C Newtons equation
D flow equation
- Q bernoullis equation is derived from
- A Newtons third law
B Euler's equation
C Newtons second law
D Newtons first law
- Q Aerodynamic resistance becomes equal to rolling resistance at the speed of
- A 10-20mph
B 20-30mph
C 50-60mph
D 70-80mph
- Q the steep angles of wind shield leads to
- A increase in solar heating

- B decrease in solar heating
C no change in solar heating
D increase and decrease solar heating
- Q The scientist who used principle of conjugate point is
A Prof Guest
B Newton
C Bernoulli
D Maurice Oiley
- Q The profile Drag consists of
A underbody drag, Forebody drag, cooling system drag
B forebody drag
C underbody drag
D cooling system drag
- Q The branch of vehicle Dynamics which deals with lateral dynamics is called as
A ride
B handling
C longitudinal
D lateral
- Q While studying vertical dynamics, vehicle is modelled as
A full car model
B half car and quarter car model
C full car model and half car model
D three fourth car model
- Q In comparison with a radial tyre, one advantage of a bias ply tyre is
A Longer life
B Lower rolling resistance
C Smoother ride at low speeds
D less life
- Q The main function of the tread pattern on tyre is that
The tread grooves pass air between the tyre and road surface, thereby
A preventing tyre from overheating

- B The crests between the tread grooves absorb road noise
In wet conditions, the tread grooves expel water that is drawn between the tyre and road surface
- C The tread pattern protects the tyre's inner carcass from small stones and pieces of glass
- D
- Q The basic purpose of tyre rotation on automobiles is to
- A Avoid ply separation
- B Equalize wear
- C Get better ride
- D Act as brake
- Q An overinflated tyre will wear the tread most near the
- A Edges
- B Corners
- C Centre
- D Lateral direction
- Q Two important angles associated with a rolling wheel are
- A Slip angle and Camber angle
- B Camber angle and king pin inclination
- C Toe-in and Toe-out
- D Caster and Camber angle
- Q Zero lateral force coincides with the zero slip angle for
- A Tubeless Tyre
- B Actual Tyre
- C Tube Tyre
- D An ideal Tyre
- Q The plies are referred to as
- A Beads
- B Tread
- C Cords
- D Carcass
- Q In case of wore wheel the vehicle weight is supported by the wires in
- A Tension

- B Compression
C Bending
D Shear
Q The frequency of resonance of tyre vibrations is 90Hz
A Modal resonance of tyre in vertical plane showing second mode
B Modal resonance of tyre in vertical plane showing Third mode
C Tyres Cross ply direction
D Modal resonance of tyre in vertical plane showing Fourth mode
Q The frequency of resonance of tyre vibrations is 110Hz
A Modal resonance of tyre in vertical plane showing second mode
B Modal resonance of tyre in vertical plane showing Third mode
C Tyres Cross ply direction
D Modal resonance of tyre in vertical plane showing Fourth mode
Q Friction circle is the graph showing limit of friction force produced during
A cornering
B combined braking and cornering
C braking
D acclerating
Q coefficient of friction needed for design of ABS system is
A peak coefficient of friction and sliding coefficient of friction
B peak coefficient of friction
C sliding coefficient of friction
D coefficient of friction
Q In the Tyre magic formula developed by Hans Bastiaan Pacejka, What the
letter "D" denotes?
A Shape Factor
B Peak value
C Stiffness Factor
D Curvatutre factor
Q In the Tyre magic formula developed by Hans Bastiaan Pacejka, What the
letter "E" denotes?
A Shape Factor

- B Peak value
C Stiffness Factor
D Curvature factor
- Q The most usual cause of excessive tyre wear is:
A Sudden braking
B Over inflation
C Under inflation
D excessive speed
- Using Tyre magic formula estimate braking effort developed by the tire with a normal load 6kN at a skid of -25 percent. (take $B=0.210$, $C=1.87$, $D=6090$ and $E=0.686$)
A (3173.74 N)
B (- 1433.4 N)
C (- 5178.56 N)
D (5178.56 N)
- Q The cross ply tyre also called as
A Radial ply tyres
B bias ply tyres
C belted bias tyres
D radial bias ply tyres
- Q Magic formula is used to calculate
A force generated by tyre
B resistance to motion
C friction between road and tyre
D Tyre stiffness
- Q The function of tyre is
A to support vehicle load and to cushion road shocks
B to damp road shocks
C to have good friction coupling
D to change direction of vehicle
- Q Rolling resistance increases as vertical load
A increases
B decreases

C no effect
D diminishes
Q Solid suspension used now a days mainly for
A passenger cars
B racing cars
C two wheelers
D heavy vehicles
Q Four link suspension used on
A cars
B trucks
C buses
D motorcycles
Q The main advantage of independent suspension is
A no camber change
B High Roll stiffness
C friction between springs
D low antidive characteristics
Q In full active suspension
A spring and damper are absent
B spring and damper are present
C spring is absent and actuator with damper is present
D damper is absent
Q The front suspension should have a ---- lower rider rate than the rear
A 32%
B 40%
C 28%
D 30%
Q In passive isolators the spring or spring damper has a typical natural
frequency of-----
A 5-10 Hz
B 3-7 Hz
C 7-15 Hz

D 3-9 Hz
In passive isolators the molded or bounded elastomer mounts has a typical

Q natural frequency of-----

A 0.17-2.5 Hz

B 0.15-2.5 Hz

C 0.10-2.0 Hz

D 1.0-1.5 Hz

Q The function of suspension system is

A To absorb shocks

B To control speed

C to have directional control

D to reduce friction

Q In leaf spring, variable rate is attained by

A using one quarter leaf

B using helper spring

C using only one long leaf

D using two quarter leaves

Q Damping in Jounce is

A desirable

B undesirable

C easy

D less effective

Q The range of the ride frequency

A 0-50Hz

B 0-25 Hz

C 0-100 Hz

D 0-1000 Hz

Q The range of the Noise frequency

A 25-20000 Hz

B 25-250000 Hz

C 0-25 Hz

D 0-100 Hz

Q Noise is usually present when lower frequency _____

- A vibrations are excited
B Vibration is reduced
C Vibration is same
D Vibration is increased
- Q Ride involves the study of the main
A Ride excitation source
B Ride
C ride zone
D Ride Area
- Q Road roughness is
A Excitation source
B Vehicle Dynamics
C implicit function
D Explicit Function
- Q The quarter-car model is limited to study of dynamics behavior in
A Horizontal direction only
B vertical direction only
C Upward direction only
D Downward direction only
- Q Effective static deflection of the vehicle should exceed roughly
A 4 inch
B 3 inch
C 6 inch
D 5 inch
- Q The roll frequency should be approximatly equal to the
A pitch and bounce frequencies
B Pitch and Roll
C Pitch and Yaw
D Yaw and Roll
- Q The actual steer angles achieved are modifies are
A suspension system
B beake system
C driving torque

- D braking torque
- Q When slip angles at front wheels is equal to slip angles at rear wheels then vehicle is said to be
- A understeer
- B oversteer
- C neutral steer
- D center steer
- Q When slip angles at front wheels is greater than the slip angles at rear wheels then vehicle is said to be
- A understeer
- B oversteer
- C neutral steer
- D center steer
- Q When slip angles at front wheels is lesser than the slip angles at rear wheels then vehicle is said to be
- A understeer
- B oversteer
- C neutral steer
- D center steer
- Q the lateral distance from the ground intercept to the wheel centerline is the offset at the ground and is called as
- A aligning moment
- B scrub radius
- C center point steering
- D neutral steer
- Q The force acting in Y direction of steering system is called as
- A normal force
- B lateral force
- C tractive force
- D cornering force
- Q The moment in Y direction of steering system is called as
- A aligning moment
- B rolling moment

- C overturning moment
D turning moment
Q The force acting in X direction of steering system is called as
A normal force
B lateral force
C tractive force
D cornering force
Q The force acting in Z direction of steering system is called as
A normal force
B lateral force
C tractive force
D cornering force
Q The moment in Z direction of steering system is called as
A aligning moment
B rolling moment
C overturning moment
D turning moment
Q Following is one of type of Mass Air Flow sensor
A Bernoulli's Meter
B Vane Meter
C Delta sensor
D Cool air sensor
Q The main purpose of engine speed sensor is to
A Monitor crankshafts rotating speed
B Monitor Air-Fuel ratio inside engine
C Monitor density of air
D monitor camshaft rotating speed
Q Oxygen sensor is also known as
A Alpha sensor
B Lambda Sensor
C Gamma Sensor
D Beta Sensor
Q Oxygen sensor is located

- A Before Intake manifold
- B Before Catalytic converter
- C Near Exhaust manifold
- D Inside combustion chamber
- Q MAP stands for
- A Manifold Absolute pressure Sensor
- B Main Absolute Pump Sensor
- C Manipulated Absolute Pressure Sensor
- D Manifold Absolute Pressure Sensor
- Q When there is significant fall while speeding up, is the sign of following faulty sensor
- A Voltage Sensor
- B Throttle Position Sensor
- C Fuel Temperature Sensor
- D Oxygen Sensor
- Q This sensor interprets Gas pedal movement by the driver and allows for precise throttle control
- A CMP
- B ETC
- C TPS
- D CKP
- Q This sensor uses voltage signals to inform the ECM about stoichiometric ratio
- A TPS
- B MAP
- C Air/Fuel ratio sensor
- D ETC
- Q This sensor has its own internal heater
- A A/F sensor
- B HO2S
- C TPS
- D MAP
- Q PCM stands for

- A Powertrain Control Module
- B Paze Candy Machine
- C Positive Crankshaft Movement
- D None of above
- Q This sensor calculates Engine load by reading engine vaccum
- A ECT
- B MAP
- C CMP
- D CKP
- Q This sensor is usually located on the transmission and provides information about vehicle speed
- A VSS
- B CMP
- C MAP
- D ETC
- Q Bimetallic thermostat is ----- controller.
- A On-Off
- B Zero term
- C One-term
- D Two-term
- Q The brake warning light warns the driver of
- A Water in the master cylinder
- B Air in hydraulic system
- C Failure of primery and secondary circuit of hydraulic system
- D Powerbrake failure
- Q Electronic stability programme means
- A Vehicle Dynamics control system
- B Traction control system
- C central tyre Inflation System
- D Antilock Braking system
- Q
- A
- A

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