



Myfuture CBC Revision

power mechanics - Grade 10

Question Paper

1. What does the speed rating letter on a tyre indicate?

- A. The tyre's colour
- B. The maximum safe speed the tyre can handle
- C. The year the tyre was manufactured
- D. The amount of air needed in kPa

2. What is the minimum legal tread depth commonly required for passenger cars (in many countries including Kenya)?

- A. 0.5 millimetres
- B. 1.6 millimetres
- C. 10 millimetres
- D. 5 millimetres

3. In an illustrated cross-section of a four-stroke engine during the intake stroke, what is the piston movement and valve state?

- A. Piston moves up and intake valve is open
- B. Piston moves down and both valves closed
- C. Piston stationary and exhaust valve open
- D. Piston moves down and intake valve is open

4. What is the primary fuel used by most heavy buses and many public service vehicles in Kenya today?

- A. Kerosene
- B. Diesel
- C. Hydrogen
- D. Biogas

5. What does wheel alignment adjust?

- A. The engine idle speed
- B. The wheel nut torque only
- C. The tyre chemical composition
- D. Camber, caster and toe angles of the wheels

6. Which labelled arrow on an illustration would show the direction of fresh mixture entering a two-stroke cylinder during scavenging?

- A. Arrow pointing from oil sump into the piston rings
- B. Arrow pointing from spark plug into the cylinder
- C. Arrow pointing from exhaust pipe into the fuel tank
- D. Arrow pointing from transfer port into the cylinder

7. Which property is always true at the point where a radius meets a tangent to a circle?

- A. The radius is parallel to the tangent
- B. The radius bisects the tangent
- C. The radius is perpendicular to the tangent
- D. The radius is equal in length to the tangent

8. Which action helps improve a rough curve into a fair curve using a pencil and eraser?

- A. Add extra sharp angles to remove wiggles
- B. Make small, incremental corrections and redraw lightly until the curve flows smoothly
- C. Press harder to make the rough marks darker
- D. Erase the whole sheet and start a different drawing

9. How many tangents can be drawn from an external point to a circle?

- A. Infinite tangents
- B. One tangent
- C. Two tangents
- D. Zero tangents

10. When constructing a tangent from a point on the circumference of a circle, what is the correct direction of the tangent at that point?

- A. Towards the circle centre
- B. Along the radius drawn to that point
- C. At any random angle
- D. Perpendicular to the radius drawn to that point

11. How can worn suspension parts affect tyre condition?

- A. They increase the tyre's legal speed rating
- B. They convert tubeless tyres into tube tyres
- C. They make the tyres change colour
- D. They can cause uneven tyre wear and poor handling

12. Why is regular inspection of chassis mounting points and welds important?

- A. To increase tyre pressure automatically
- B. To detect cracks, corrosion or looseness that could weaken vehicle structure
- C. To reduce engine compression slowly
- D. To improve the colour of the paint on the roof

13. When drawing an illustration of the four-stroke cycle, what label should be placed at the top dead centre (TDC) at the end of the compression stroke?

- A. Spark plug fires (start of power stroke)
- B. Exhaust valve opens
- C. Transfer port opens
- D. Intake valve opens

14. What is the advantage of having a designated tool storage area in the workshop?

- A. Tools will rust faster
- B. Tools will be easier to find, reducing downtime and loss
- C. It increases clutter on workbenches
- D. It prevents anyone from using tools

15. On an illustration showing piston movement, which position corresponds to the end of the exhaust stroke in a four-stroke engine?

- A. Outside the cylinder
- B. Mid-stroke with valves closed
- C. Top Dead Centre (TDC)
- D. Bottom Dead Centre (BDC)

16. What does fairing a curve mean in drawing practice?

- A. Making the curve as wavy as possible
- B. Removing the curve entirely
- C. Checking and adjusting the curve so it is smooth with gradual changes in slope
- D. Filling the area under the curve with shading

17. When illustrating valve overlap on a four-stroke engine, what does valve overlap mean?

- A. The valves are replaced by ports
- B. The valves are removed for maintenance
- C. Intake and exhaust valves are open at the same time briefly
- D. Both valves are permanently closed to save fuel

18. What role does an oil drain and collection area play in workshop layout?

- A. A safe place to collect and store oil for recycling and disposal
- B. It is an area to wash hands with oil
- C. A decorative pond to attract wildlife
- D. A place to dump city waste

19. When constructing a tangent from a point outside a circle using compass and straightedge, which step is essential?

- A. Joining the external point to the circle's centre and constructing a right triangle to
- B. Using the external point as a centre to draw an auxiliary circle equal to the given circle
- C. Drawing a circle with centre at the external point to find chord midpoints
- D. Joining the external point to the circle's centre and constructing the perpendicular

20. How can worn wheel bearings commonly be identified while driving?

- A. By a constant humming or grinding noise that changes with speed
- B. By the horn sounding different
- C. By increased fuel consumption only at idle
- D. By a sudden loss of tyre pressure

21. Which wheel component allows the wheel to rotate smoothly around the axle?

- A. Valve stem
- B. Tyre tread
- C. Wheel nut
- D. Wheel bearing

22. In pulley layout for a flat belt, the belt segments between pulley contact points are approximated as:

- A. Arcs of smaller radius
- B. Straight tangents between pulleys
- C. Spiral curves joining the pulleys
- D. Random curvy lines

23. Which is the correct relation for the tangent length t from external point P to circle centre O with radius r and $OP = d$?

- A. $t = r - d$
- B. $t = d * r$
- C. $t = d + r$
- D. $t = \sqrt{d^2 - r^2}$

24. Why is it important in mechanical parts to blend lines and curves at joints rather than leave sharp corners?

- A. To hide the join so it cannot be measured
- B. To make manufacturing impossible
- C. To reduce stress concentration and improve strength
- D. To make the drawing take up less ink

25. Why is engine lubrication important?

- A. To improve the flavour of the fuel
- B. To reduce friction and wear between moving parts and help remove heat
- C. To make the engine heavier
- D. To block the fuel injectors

26. A worn wheel bearing is likely to produce which symptom?

- A. A humming or growling noise that changes with vehicle speed
- B. The brakes locking permanently
- C. A sudden drop in engine oil level
- D. Flickering dashboard lights

27. What happens to the tangent points when a line is tangent to two concentric circles (same centre)?

- A. Tangent points overlap with the centre
- B. There are no common tangents because concentric circles cannot be tangent to the
- C. A line touches both circles always at two points each
- D. The tangent points are at the same place on both circles

28. Why is tyre rotation (moving tyres between positions) recommended?

- A. To increase the tyre's legal load index
- B. To change the tyre's speed rating
- C. To make the tyre wider
- D. To even out tyre wear and extend tyre life

29. How should workshop entrances be designed to suit a Kenyan school workshop environment?

- A. Wide enough for equipment and supplies, with ramps if needed and secure doors
- B. Only accessible through windows
- C. With no doors to save costs
- D. They should be narrow and hard to access

30. What is the purpose of marking floor aisles and safety zones in the workshop?

- A. To hide spills from supervisors
- B. To decorate the floor with colours
- C. To guide material flow, separate work areas and improve safety
- D. To make the floor slippery

31. If an illustration shows a piston at bottom dead centre (BDC) with ports open in a two-stroke engine, what is likely happening?

- A. Compression reaching its peak right before ignition
- B. Valves closing to lock gases in
- C. Spark plug firing to start power stroke
- D. Transfer of fresh mixture into the cylinder and exhaust leaving

32. Which classroom drawing best explains why two-stroke engines tend to make more noise than four-stroke engines?

- A. Diagram showing larger muffler on two-stroke engines
- B. Chart of tyre pressure
- C. Picture of a car driving quietly
- D. Drawing showing power strokes each revolution and overlapping intake/exhaust

33. Which technological development has most directly helped reduce harmful exhaust emissions from modern petrol cars?

- A. Introduction of catalytic converters
- B. Extra cup holders
- C. Larger radios
- D. Wider tyres

34. Which greenhouse gas is produced in large amounts by burning petrol and diesel in vehicle engines?

- A. Helium (He)
- B. Carbon dioxide (CO₂)
- C. Argon (Ar)
- D. Ozone (O₃)

35. What does the term 'horsepower' measure in a vehicle?

- A. The fuel tank size
- B. The tyre pressure standard
- C. The power output of an engine
- D. The number of horses needed to tow the vehicle

36. What is the main function of a road wheel on a motor vehicle?

- A. To control the engine speed directly
- B. To support the vehicle's weight and transmit driving, braking and cornering forces to the ground
- C. To act as the vehicle's primary electrical ground
- D. To store fuel for the engine

37. In a labelled diagram of a two-stroke engine, what is 'scavenging' referring to?

- A. The upward movement of the camshaft
- B. The process of pushing out exhaust gases and drawing in fresh mixture
- C. The electronic ignition timing adjustment
- D. The cooling of the engine by coolant

38. How did the spread of motor vehicles help Kenya's economy in the 20th century?

- A. By eliminating the need for roads
- B. By replacing all trains immediately
- C. By making farming impossible everywhere
- D. By improving transport of people and goods, creating jobs and supporting trade

39. What is the primary role of a carburettor in older petrol vehicles?

- A. To act as the battery for the vehicle
- B. To filter engine oil
- C. To compress the air-fuel mixture to ignite it
- D. To mix air and petrol in the correct ratio before entering the cylinder

40. What is the main advantage of tubeless tyres over tube-type tyres?

- A. They are less likely to blow out suddenly and can be repaired more easily
- B. They are always cheaper
- C. They do not require air pressure
- D. They never get punctures

41. What is the correct way to tighten wheel nuts when fitting a wheel?

- A. Tighten in a star or crisscross pattern to seat the wheel evenly
- B. Leave nuts finger-tight only
- C. Tighten each nut fully in clockwise order around the wheel
- D. Tighten only one nut and drive a short distance

42. What is a common internal tangent to two circles?

- A. A line that touches both circles and crosses the line joining their centres
- B. A line that touches only one circle
- C. A line that touches both circles without crossing the line joining their centres
- D. A line that goes through both circle centres

43. What is the effect of excessive toe-in or toe-out on tyres?

- A. Better fuel economy and longer engine life
- B. Improved radio reception
- C. Cooler brake discs and longer brake life
- D. Uneven and rapid tyre wear and poorer steering response

44. For two non-overlapping circles, what is the easiest indicator that a straight line is an external common tangent?

- A. It passes through both centres
- B. It touches each circle at multiple points
- C. It does not intersect the line joining the two centres
- D. It intersects both circles' interiors

45. When repairing a small puncture in a tubeless tyre, what is the common safe repair method at a workshop?

- A. Pouring oil into the tyre to seal the hole
- B. Taping the outside of the tyre with duct tape
- C. Plugging and patching from the inside (combination repair) by a trained technician
- D. Welding the rubber closed

46. If two circles are tangent externally, what is true about the distance between their centres?

- A. It equals zero
- B. It equals the sum of their radii
- C. It equals the difference of their radii
- D. It equals twice the larger radius

47. What is a run-flat tyre designed to do?

- A. Remove stones from the tread while driving
- B. Change colour when air pressure is low
- C. Allow limited driving after a puncture so the vehicle can be driven to safety or a repair shop
- D. Automatically inflate itself to correct pressure when punctured

48. What is the purpose of the differential in the rear axle of a vehicle?

- A. To increase the fuel efficiency of the engine directly
- B. To pump more oil into the engine
- C. To allow the driven wheels to rotate at different speeds while cornering
- D. To connect the engine to the battery

49. What does the tyre marking 175/70 R14 tell you?

- A. Tyre width 175 cm, rim diameter 70 inches, radial tyre, 14 ply
- B. Tyre pressure 175 kPa, tread depth 70 mm, rim type R14
- C. Tyre width is 175 mm, aspect ratio 70%, radial construction, rim diameter 14 inches
- D. Maximum speed 175 km/h, 70 kg load index, rim size 14 mm

50. What replaced horse-drawn carts as the main means of city transport during the early 20th century?

- A. Sailing ships
- B. Motor vehicles (cars, buses)
- C. Hot-air balloons
- D. Steam locomotives in every street

