Knowledge Of Material And Automotive Technology National Exam Correction 2015

SECTION A

1. Purpose of compression rings of piston
   - Sealing on the combustion chamber
   - Heat dissipation of the piston
   - Allow the compression of the engine
   - Limiting oil to enter in the combustion chamber
2. Same manufacture use a dual coil spring in the valve closing the system
   - It increase the valve closing pressure
   - It help better closing of the valves
   - It participate in noise damping
3. The proper tool used for tightening the cylinder head is:
   - Torque wrench
4. Any ten (10) parts or components of modern automobile are:
   - Cylinder head
   - Cylinder block
   - Crank shaft
   - Cam shaft
   - Piston
   - Piston ring
   - Electromagnetic fuel injector
   - Connecting rod
   - Main seal
   - Thrust bearing
   - Oil pan
   - Rocker arm
   - High pressure pump
5. Give five(5) courses of too much rich or lean mixture
   - Lack of intake system
   - Charging of intake system
   - Closing of fuel system
   - Low or high pressure
   - Oxygen sensor
   - Air flitter clogged
   - Excessive advanced
   - Injection nozzle dribbling

- Damaged pressure regulator
- Faulty air flow sensor
- Engine over heating

6. The crank shaft is made from the flowing materials
   - Alloyed tempering steel
   - Nit riding steel
   - Modular graphic cast iron
7. A six cylinder engine a bore 70mm and stork of 80mm,if clearance volume of one cylinder is $4800mm^3$,calculate a. Compression ratio

   b. Capacity engine

   Given data

   Bore (l) =70mm

   Stroke(s) =80mm

$Vc=42000mm^3$

8. Define the term Additives
   - ✓ is chemical substance that added in the oil in other to improve their property

     or

   - ✓ is chemical substance that is added in the oil to suppress in the un wanted properties and other to give the oil desirable properties

9. what are the Function of additives
   - Oiliness agent
   - Anti-wear agent
   - Detergents
   - Oxidation and corrosion in habitus
   - Poor depressants
   - Viscosity index improves
   - Change color

10. List two types of valves guide used in thermal engine
    - Internal valve guide
    - Pressed in guide
    - Cast in bronze valve guide
    - Special cast iron valve guide
    - Cast in aluminum cast iron

11. List the Function of relief valve (by pass valve) in lubrication system
    - To protect the lubrication system from over or high pressure
    - To protect the lubricating component from damaged or destroying
    - To keep the normal operating of the system
    - Allow excessive oil to be cooled
    - It bypass oil when oil clogged

12. What are the Difference between dry cylinder sleeves and wet cylinder sleeves

Dry cylinder	Wet cylinder
• They not indirect contact with the coolant	• Are nicker
• Are removable	• We are not removable
• Are generally passed into the block	• Are not passed into the block

13. List Three types(3) of cast iron do you know?
    - Flack graphic cast iron
    - Modular graphic cast iron
    - Vermicular graphic cast iron
    - Malleable graphic cast iron
    - Cast steel

14. What are the forms of the mental crystal
    - Baby – centered cubic crystal
    - Force– centered cubic crystal
    - Hexagonal crystal

15. List six properties that are required for a choosing material
    - Low density
    - High strength
    - Good thermal conductivity
    - Low thermal expansion
    - Friction resistance

16. What are three method for checking fuel pump on gasoline engine
    - Checking the connecters
    - Checking the operation voltage
    - Checking the fuel pressure
    - Checking the pump delivery flow rate
17. List the Two component of fuel injection system on diesel engine
    - Fuel pump
    - Fuel primer pump
    - Low pressure level pipe
    - High pressure pump
    - Fuel injection
    - Fuel rail
    - Fuel pressure regulator
    - Fuel injection pump
18. List Two types of diesel engine
    - Direct injection diesel engine
    - Indirect injection diesel engine
    - Two stork diesel engine
    - Four stork diesel engine

SECTION B

19. A. Name Same of the troubles which usually occur in the cooling system of an engine
    - Less of coolant due to leak over heating
    - Incorrect temperature gauge reading
    - Noise
    - Frozen coolant
    - Coolant level to low
    - Fan –v- belt damaged
    - Water pump defective
    - Fan electrical motor defective
    - Thermostat faire open or thermostat remain closed
    - Thermostat stuck open
    - Radiator clogged
    - Faulty coolant temperature sensor

B. Explain the working of the thermostat

- The thermostat is closed position when the engine is closed
- It does not permit water to enter in radiator
- Water re-circulates through the engine fill the engine reach the operating temperature quickly
- At that stage the thermostat opens by passage and is permitted enter radiator

20. A. by what can the corrosion of material be influenced?
    - The chemical composition
    - The percentage per unity
    - The surface quality
    - Composition of corrosion medium
    - Pressure and temperature of the corrosion medium

B. name four Technological properties

- Cast ability
- Machinability
- Weld ability
- Formability

C. Explain the term of composite material

- Composition material are material in which two or more individual material have been combined to form new material

21. A. Explain what is phasing and what is calibration of injection pump
    - Phasing : is testing and if necessary adjusting and injector pump to ensure that which pumping element cause injection of exactly the correct internal of degrees the proceeding element
    - Calibration : testing and if required an injection pump to ensure that deriving the contact amount of fuel out corrosions speed and which setting and each element is supplying equal amount of fuel

B. To what degree of occurs must be the flowing operation is carried out

- To within ½ degree (1) and within i_2 percent

22. A. The excellent performance of modern ci engine is largely due to great amount of research work done on combustion chamber design. Summarize eight derisible characteristics of good combustion chamber
    - Good compression ratio
    - Low tendency to knock
    - Normal operating temperature

- Compact combustion chamber
- Good scavenging of exhaust gas
- High volumetric efficient
- Combustion completed wear the TDC
- Maximum thermal efficiency
- Maximum heat loose zone around spark engine
- Short combustion distance
- Large opening cross section of in let valve

b. They are two main function of vale in engine. What are these functions?

- To open and closed the inlet and exhaust passage of the cylinder
- To dissipate heat through its seat to the cylinder heat

23. A. what Potential consequence of an adequate seal between the cylinder head and the cylinder block are :

- Power loss(part of the gases is lost)
- Burning of the cylinder head gasket oil loss
- Engine damaged caused by coolant entering the combustion chamber
- Presence of oil in the combustion chamber
- Low completion pressure
- Leakage of oil
- Leakage burned of burned gases
- Engine smoke
- Presence of water in the combustion chamber
- Oil consumption
- Overheating engine
- Engine knocking

B. Explain the point must be observed when the cylinder gasket is replaced

- Before releasing the cylinder head belt allow the engine to clod down the in order to prevent the cylinder head from being destroyed
- Remove all gasket remnant which are stick gasket
- The sealing surface of the cylinder head one cylinder block must be level
- The thickness of the cylinder head must conform to manufactures speciation
- The coolant and engine oil passage much up
- Combustion chamber living must not pressure into combustion chamber as this could result auto-ignition

SECTION C

24. Explain how can you perform

A. The compression pressure test for petrol engine

- Carry out the check only when the engine is at normal operating temperature
- De active the electronic ignition system
- Insert the test chord in the compression tester so that the point is at cylinder so that they spark plug hole (1) and open the throttle valve fill
- Crank the engine with starter by approximately revolution
- Vent the completion tester before the test chart is moved to the cylinder head 2 position

B. The compression loos test for the same engine

- The position must be TDC of the completion stork
- Connect the pressure loss tester to the compressed air system (5bar—10bar) and corroborate using the knocked screw
- Connect the tester via the spark plug threat of cylinder
- The pressure loss tester by leak is indicted in the percentage at the pressure gauge and must not exceed the valve specified
- In the event of large leak the faulty source of can determined by identifying the air out let

25.Name the possible cause of diesel engine

A. Engine crank normally but will not start

- Incorrect or dirty fuel
- No fuel to the nozzle or injection pump
- Plugged fuel return
- Pump timing off
- In operative grow plug
- No fuel in the tank
- Low level of the fuel
- Low comparison of the engine
- Engine out of the engine
- Defective injection nozzle
- Leakage of fuel nozzle
- Leakage of fuel lines
- Air filter clogged

B. The possible cause of diesel engine has loss of power

- Incorrect or dirty fuel
- Restricted fuel return

- Plugged fuel tank vent
- Restricted fuel supply
- Engine temperature sensor
- Electrohydraulic valve
- Hydraulic tappet or cam follower
- EGR valve
- Idle speed actuator
- Air mass meter
- Potentiometer
- Knocking sensor
- Electronic throttle valve actor
- Secondary air pump
- Carbon canister
- Electronic carburetor
- Air pressure sensor
- Oil temperature sensor
- Fuel temperature sensor
- Fuel pressure sensor
- Cylinder head gasket
- Crank shaft position sensor
- Cylinder head caver
- Cylinder head gasket

C. The possible cause of diesel engine has

- Plugged fuel or air filter
- Injection pump timing off
- Hydraulic timing device
- Faulty speed governor
- Engine speed sensor defective
- Faulty ECU
- Excessive retard

Knowledge Of Material And Automotive Technology National Exam Correction 2016

Section a: do all question

1. Give an Advantages of cylinder sleeves