KUMARAGURU
college of technology
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Register Number:……..

B.E DEGREE EXAMINATIONS: NOV/DEC 2014

(Regulation 2009)

Seventh Semester

AUTOMOBILE ENGINEERING

AUE141: Automotive Component Manufacturing

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Aluminum alloy is used for cylinder blocks because
   a) It is lighter and has good heat dissipation characteristics
   b) Material cost is low
   c) It does not require any cylinder liners
   d) The piston is also made up of aluminum alloy
2. What is the smallest size of the component that can be casted with the help of lost foam process?
   a) 10mm
   b) 20mm
   c) 2.5mm
   d) 0.25mm
3. Clutch facings are usually attached to the plate by
   a) Steel rivets
   b) Brass rivets
   c) Aluminum rivets
   d) Steel screws
4. Which one of the following methods produces gear by generating process?
   a) Punching
   b) Hobbing
   c) Casting
   d) Forging
5. Which part of the automobile tyre is subjected to greatest flexing action
   a) Bead
   c) Shoulder

b) Sidewall d) Thread

6. The vehicle component able to withstand the impact, bending loads from beam to body, torsion loads from end of the body and fatigue loads is
   a) Springs c) Axle
   b) Differential d) Wheels & tyres
7. Which part of the vehicle is not made with the help of hydro forming process?
   a) Driving shafts c) Exhaust Systems
   b) Axle elements d) Engine Components
8. The vehicle component able to resist turning motion in a clutch, absorb vibration and provide better damping?
   a) Springs c) Axle
   b) Differential d) Wheels & tyres
9. Identify the process in which atom by atom transfer of material from the solid phase to vapour phase and back to solid phase occurs
   a) CVD c) Electro-plating
   b) Sol gel d) PVD
10. A _____ supplies the extra power necessary when the vehicle's electrical load exceeds the supply from the charging system.
    a) Battery c) Regulator
    b) Alternator d) Starter Motor

PART B (10 x 2 = 20 Marks)

11. State the reasons why pressure die cast products are better in finish than sand cast products.
12. Squeeze casting is one of the preferred methods used in the manufacture of pistons. Justify
13. Clutch discs are shot peened. Justify.
14. What is meant by precision forging of gears?
15. Mention any three design requirements for manufacturing an axle
16. State the materials that can be effectively ground in producing a good tyre.
17. Mention any four products that are manufactured using plastics in cars. And justify on

what basis these components are far better in comparison to metal parts used earlier.

18. Why are leaf springs preferred over other suspension types for heavy vehicles?
19. Illustrate with neat sketch the phase transition during physical vapour deposition.
20. Briefly explain the need for an alternator and a starting motor in an automobile.

PART C (5 x 14 = 70 Marks)

21. a) With the help of a flowchart and neat sketches, explain in detail the processes used in the manufacturing of an engine valve.

(OR)

b) Explain in detail With neat illustrative sketches the processes used in the manufacturing an engine block using a suitable casting process.

22. a) Using neat sketches describe the manufacture of a friction plate. Justify which process/method is better over the other?

(OR)

b) Explain in detail with neat sketches the manufacturing process of gears using broaching method and also state the limitation of broaching process over Hobbing method

23. a) (i) Select the best method to cast a rear axle casing for a truck and explain the method involved with neat sketches (7)

(ii) Explain in detail the steps in manufacturing a tyre for a four wheeler with suitable diagrams. (7)

(OR)

b) Discuss in detail the various types of heat treatment and surface hardening for a propeller shaft.

24. a) (i) Explain briefly with the aid of neat sketches the thermoforming methods used for making body components in a vehicle. (7)

(ii) Elaborate in detail with the aid of neat sketches the hydroforming method used in the manufacture of chassis frames for two wheelers. (7)

(OR)

b) (i) Explain the three types of Resistive Welding techniques with the aid of neat diagrams. (7)

(ii) With the help of a flowchart, describe the process flow used for the moulding of a dashboard. Name the material used for dashboard in today's cars. (7)

25. a) With the aid of a neat sketch discuss in detail the following surface coating methods

(i) Chemical vapor deposition. (7)

(ii) Physical vapor deposition. (7)

(OR)

b) What is the purpose of a automotive battery and explain in detail how a battery is made?

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