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Total No. of Pages : 02

Total No. of Questions : 18

**B.Tech. (AE) (2012 to 2017) (Sem.-5)**  
**DESIGN OF AUTOMOTIVE COMPONENTS**  
Subject Code : BTAE-504  
M.Code : 70487

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTION TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****Explain briefly :**

1. What do you understand by automotive component design?
2. Name any five automotive components.
3. What are the manufacturing considerations in automotive design?
4. What is the importance of free body diagram in automotive design?
5. Name any two theories of Failure used in automotive design.
6. Name any two common materials used for piston and cylinder manufacturing.
7. What is the function of cam shaft?
8. What is stress concentration?
9. Define factor of safety.
10. What is the difference between torsion and shear?

### SECTION-B

11. How the material selected for piston, cylinder, connecting rod and crank shaft? What are the design considerations and explain the importance of failure theory?
12. Explain the various stress imposed on bolted joint. How it affects the bolted joint failure?
13. Explain briefly the design process of fillet joint for SS 304 steel of 10 mm thickness. Draw the joint design and show stresses acting on it.
14. What are self-energising brakes? How they are different from shoe brakes? Explain with diagram.
15. How the disc brakes are designed? What are the applications of it? Explain with diagram.

### SECTION-C

16. Explain the design process of centrifugal clutch. Enlist the design consideration, applications, merits and demerits.
17. What is the function of bearing? What is the basic type of bearing? How they are designed?
18. Draw the diagram of spur, helical and bevel gears. Explain the difference in working clearly.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.**