Q.30 Describe the major stresses in leaf spring. (CO-5)
Q.31 Define the various connecting rod dimensions. (CO-1)
Q.32 Describe the various stresses induced in the piston. (CO-5)
Q.33 A single dry plate clutch is to be designed to transmit 6KW at 900 rpm. Find diameter of the shaft, Allowable shear stress of shaft, $\tau 1 = 40$ N/mm^2. (CO-5)
Q.34 Enumerate any five factors considered while designing a cylinder head. (CO-5)
Q.35 Describe the various material used for designing a piston. (CO-4)

Section-D

Note: Long answer Questions. Attempt any two Questions out of three Questions. (2x10=20)

Q.36 Explain the selection criteria for various engineering materials for design of Automotive components. (CO-4)
Q.37 Design a cast iron Piston for single acting four stroke engine for the following specifications: Cylinder bore is equal = 100 mm; stroke = 110 mm; maximum gas pressure = 10 N/mm2; brake mean effective pressure = 0.75 N/mm^2; fuel consumption = 0.2 to 8 kg/kW/hr; speed =2500 RPM. (CO-2, CO-3, CO-4, CO-5)
Q.38 Explain the complete procedure of design of multiplate clutch. (CO-2, CO-3, CO-4, CO-5,CO-6)

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Roll No.....

180362B/170362B

6th Sem,

Branch : Automobile Engineering

Subject : Design of Automotive components

Time : 3 Hrs. **M.M. : 100**

SECTION-A

Note : Multiple choice questions. All questions are compulsory. (10x1=10)

Q.1 Ability of the material to have large plastic deformation without fracture when subjected to tensile force is called (CO-1)
a) Brittleness c) Ductility
b) Malleability d) Elasticity

Q.2 Maximum normal stress theory is used for (CO-2)
a) Brittle material c) Plastic Material
b) Ductile material d) Non-ferrous material

Q.3 Which of the following is non-ferrous material? (CO-4)
a) Cast iron c) High speed steel
b) Brass d) Stainless steel

Q.4 Design stress should be less than _____ (CO-3)
a) Working Stress c) Fatigue stress
b) Endurance limit d) Fracture limit

Q.5 Which type of failure may take place in a knuckle joint? (CO-5)
a) Tensile c) Crushing
b) Shear d) All of these

Q.6 Which of the following is subjected to bending load? (CO-5)

a) Clutch Plate c) Flywheel
b) Gear d) Axle

Q.7 Which of the following is not a type of coupling (CO-5)
a) Hooke's joint c) Flange
b) Oldham d) Spigot & socket

Q.8 If number of contacting surfaces are 5, then number of disks required in multi disk clutch are? (CO-5)
a) 4 c) 6
b) 5 d) Can't be determined

Q.9 If the spring is compressed completely and the adjacent coils touch each other, the length of spring is called as? (CO-5)
a) Solid length c) Free length
b) Compressed length d) None of the above

Q.10 The gears that have teeth parallel to the axis of rotation and are used for parallel shafts are called (CO-5)
a) Spur gear c) Bevel gear
b) Helical gear d) worm gear

Section B

Note: Objective type Questions. All Questions are compulsory. (10x1=10)

Q.11 State Hooke's law. (CO-1)

Q.12 Name any one mode of failure. (CO-2)

Q.13 Which theory is suitable for the safe design of machine components made of brittle materials. (CO-3)

Q.14 Bell crank lever arms are subjected to bending moment. (True/False) (CO-1)

Q.15 Name any one material used for propeller shaft. (CO-4)

Q.16 A spring of stiffness constant K is cut in two equal parts. The stiffness constant of new spring will be k/2. (True/False) (CO-5)

Q.17 Gudgeon pin connects the piston and the _____. (CO-1)

Q.18 Pistion pins are usually made of _____ (Name the material) (CO-4)

Q.19 The coefficient of friction is internally expanding brakes is constant. (True/False) (CO-5)

Q.20 Name the type of gear used in constant mesh gear box. (CO-4)

Section-C

Note: Short answer type Questions. Attempt any twelve Questions out of fifteen Questions. (12x5=60)

Q.21 Enlist the important factors considered for design. (CO-5)

Q.22 Classify external loads and define. (CO-1)

Q.23 Describe the concept of standardization. (CO-4)

Q.24 Define factor of safety. How it is decided? (CO-5)

Q.25 Write the design procedure of rear axle for bending. (CO-5)

Q.26 Give various reasons for failure of knuckle joint. (CO-2)

Q.27 Draw a neat labelled diagram of a rocker arm and state how diameter of shaft is calculated. (CO-5)

Q.28 Define the terminology associated with engine cylinder. (CO-5)

Q.29 A gear drive consists of two gears, A and B and has a velocity ratio of 1.50 Gear A has 28 teeth. If the gears have a module of 2mm, determine: (i) number of teeth on Gear B; (ii) the pitch circle diameter of the two gears. (CO-5)