Q.30 Write the importance and scope of preferred numbers in machine design. (CO6)

Q.31 Describe the function of cam shaft (CO1)

Q.32 Describe the modes of failure of cylinder. (CO2)

Q.33 Write the function of Rocker arm. (CO1)

Q.34 Describe the design considerations for rocker arm. (CO5, 4)

Q.35 Pinion gear with 20 teeth and a module of 6mm has a rotational speed of 1200 rom drives a gear at 600 rpm. Determine the number of teeth on the gear (CO5)

SECTION-D

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

Q.36 Design a cast iron protective type flange coupling to transmit 15 kilowatt at 900 RPM from an electric motor to a compressor. The service factor may be observed as 1.35. the following permissible stresses may be used: Shear stress for shaft Bolt and key material = 40MPa; Crushing stress for Bolt and key = 80MPa. Shear stress for cast iron = 8MPa (CO2,3,4,5,6)

Q.37 A four stroke internal combustion engine has the following specifications: Brake power = 10 KW; Speed = 1500rpm; indicated mean effective pressure = 0.35 n/N/mm^2; Maximum gas pressure =3.5 N/mm, Mechanical efficiency =80% Determine

a) The dimensions of the cylinder, if the length of stroke is 1.4 times the bore of the cylinder;

b) Wall thickness of the cylinder, if the hoop stress is 35 MPa. (CO2,3,4,5)

Q.38 Discuss Maximum Principal stress theory and Maximum Shear stress theory. (CO2)

Roll No. .....

6th Sem / Auto

Subject:- Design of Automotive Components

Time : 3Hrs. M.M. : 100

SECTION-A

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

Q.1 Which of the following ergonomics factors are encountered in engineering applications? (CO5)

a) Thermal radiations b) Fatigue
c) Lubrication failure d) Corrosion

Q.2 Among maximum shear stress theory and distortion energy theory, which one gives the higher value of shear yield strength? (CO1)

a) Maximum shear stress theory
b) Both give equal values
c) Distortion energy theory
d) Vary from material to material

Q.3 Knuckle joint can be used to connect two rods (CO1)

a) Whose axes coincide
b) Which lie in same plane
c) Whose axes intersect
d) All of the above

Q.4 Which of the following facts are true for resilience? (CO1)

a) Ability of material to absorb energy when deformed elastically
b) Ability to retain deformation under the application of lead or after removal of load
c) Ability of material to absorb energy when deformed plastically
d) None of the mentioned

Q.5 Which stress is included in cylinder wall due to side thrust of the piston? (CO3)

a) Axial stress
b) Longitudinal stress
c) Circumferential stress
d) Bending stress

Q.6 Multi leaf springs are not recommended for automobile and rail road suspensions. (CO5)

a) True b) False

Q.7 Yield strength is defined as the maximum stress at which a marked increase in elongation occurs without increase in_____ (CO2)

a) Load b) Toughness
c) Strength d) Hardness

Q.8 Which of the following relation is stated by Hooke's law? (CO1)

a) Stress is directly proportional to strain
b) Stress is inversely proportional to strain
c) Stress is directly proportional to square of strain
d) Stress is inversely proportional to square of strain

Q.9 If shaft diameter is 60mm. how many bolts are recommended for rigid flange coupling? (CO5)

a) 2 b) 3
c) 4 d) 5

Q.10 Which of the following can be used for power transmission in intersecting shafts? (CO5)

a) Spur Gear b) Helical Gear
c) Bevel Gear d) None of the listed

SECTION-B

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

Q.11 Define stress. (CO1)

Q.12 Define critical speed of shaft. (CO1)

Q.13 The yield point in static load is_____ as compared to fatigue loading. (CO1)

Q.14 Write the type of stress which causes the failure of piston crown. (CO2)

Q.15 Write the type of lever used for operating hand brakes. (CO5)

Q.16 Write the unit of modulus of elasticity. (CO1)

Q.17 Write SI unit of Torsion. (CO1)

Q.18 The main leaf of a leaf spring bears about 50% of the total load of the Spring. (True/False) (CO5)

Q.19 Name any one material used for propeller shaft. (CO4)

Q.20 Write the type of stress which causes the failure of piston crown. (CO3)

SECTION-C

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

Q.21 Describe maximum Shear Strain Energy Theory. (CO2)

Q.22 Prepare a procedure to design a propeller shaft. (CO5)

Q.23 Enlist the materials used in single plate clutch. Give justification of their use. (CO4)

Q.24 Describe the various stresses induced in the connecting Rod. (CO5)

Q.25 Explain sliding mesh gearbox (CO1)

Q.26 What is factor of safety? How to select factor of safety for a machine part material. (CO5)

Q.27 Write the factors which affect the selection of materials. (CO5)

Q.28 Draw the stress strain curve for a mild steel specimen (CO1)

Q.29 Describe the design consideration for piston pin. (CO5)