ME-L

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5E1718

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5E1718

B.Tech. V-Sem. (Main & Back) Examination, January/February - 2024

Automobile Engineering

5AE3-01 Mechatronic Systems

AE,ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five questions out of seven questions from Part B and three questions out of five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used! Calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory **(10×2=20)**

1. How do mechatronic systems contribute to automation in manufacturing?
2. What are the key components of a feedback control system in mechatronics?
3. How are transfer functions utilized in constructing Bode plots for mechatronic systems?
4. How can a BJT be used to control a DC motor?
5. Discuss the concept of Pulse Width Modulation in the context of DC motor control using FETs.
6. Why PLCs are Preferred to use over microcontrollers in industries?
7. Differentiate between accuracy and precision
8. Which displacement sensor has the slowest response time?
9. Why brushes are not used in BLDC?
10. What are the types of PLC programming languages?

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions **(5×4=20)**

1. Discuss the importance of modeling and simulation in mechatronic design.
2. A motor has torque constant of 100 Nm A and voltage constant of 12 V per kilo revolution/mm. The armature resistance is 2Ω. If 24 V voltage is applied to the terminal, what would be
   a) the torque at the rotor,.
   b) speed at zero load, and
   c) torque at 100 revolutions per minute. Plot the result as a speed versus torque graph.
3. How are ladder logic diagrams used for programming PLCs? Provide an example.
4. Explain the construction and working of Bipolar Junction Transistor.
5. Discuss the effect of feedback of closed loop control system.
6. What is a proximity sensor? Explain the working of an eddy current proximity sensor.
7. What are the basic operational steps in PLC programming? Draw the physical structure of PLC.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any three questions **(3×10=30)**

1. Differentiate between sensors and actuators with the help of suitable examples. Explain various pressure sensors used and comment on their sensitivity and linearlity.
2. Explain the modelling of one and two degrees of freedom systems. Clearly write the steps in modelling.
3. What is micro-actuation? Explain the principles used for micro-acutation.
4. Discuss the fault analysis in mechatronic systems.
5. Explain the automated manufacturing system with the help of a case study.

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5E1321

B.Tech. V-Sem. (Back) Examination, January/February - 2024

ESC Mechanical Engg.

5AE3-01 Mechatronic Systems

AE,ME

Time : 2 Hours **Maximum Marks : 80**

Min. Passing Marks: 28

Instructions to Candidates:

Attempt all Five questions from Part A. Four question out of Six questions questions from Part B and Two questions out of Three questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data missing suitably be assumed and stated clearly. Units of quantities used! calculated must be stated clearly. Use of following supporting material is permitted during examination(As mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(5×2=10)**

1. Define the terms Mechatronics and Mechatronic Systems.
2. What is the function of relay?
3. Define transfer function.
4. What are the instruments used to measure linear and rotary displacement?
5. What are the basic functions of control system?

PART - B

(Analytical/Problem solving questions)

Attempt any Four questions. **(4×10 =40)**

1. Explain the key elements of Mechatronic system with a block diagram also mention the functions of a Mechatronic system.

2. Sketch the basic architecture of a PLC and explain the function of each element. Explain how a PLC can be used to handle an analog input.

3. What do you mean by system modeling? Model a mechanical system with spring, mass and damper.

4. What is data acquisition system? Explain the components used in this system with suitable diagram.

5. Define the term Transducer. Write short note on strain gauge sensor also discuss its applications.

6. Explain the elements of microprocessor with its block diagram. How it is different from microcontroller?

PART - C

(Descriptive/Analytical/Problem Solving/Design question)

Attempt any Two questions. **(2× 15 = 30)**

1. What is the role of hydraulic actuator in metachronism? Explain the working of permanent magnet stepper motor with suitable sketch, and state its advantages and limitations.

2. What is stability analysis of state space model? Explain the Bode Plot method for stability analysis with sketch and also list the advantages.

3. What are the benefits of metachronism in manufacturing? Explain the working of automatic camera and car engine management system in details.

5E6202

Roll No. _____ [Total No. of Pages : 2

5E6202

B.Tech. V sem. (Old Back) Examination January/February- 2024
Automobile Engineering
5AE2A Dynamics of Machines
AE, ME

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five** questions, selecting **one** question from **each unit**. All questions carry **equal** marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly)*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

Unit - I

1. a) Explain Hartnell governor with the help of neast sketch. **(8)**

   b) Describe sensitiveness of governors. **(8)**

(OR)

1. a) Explain proell governor with the help of neast sketch. **(8)**

   b) Give the comparison between flywheel and governor. **(8)**

Unit - II

2. The mass of the turbine rotor of a ship is 20 tonnes and has a radius of gyration of 0.60m. Its speed is 2000 r.p.m. The ship pitches 6° above and 6° below the horizontal position. A complete oscillation takes 30 seconds and the motion is simple harmonic. Determine the following:

   i. Maximum gyroscopic couple.

   ii. Maximum angular acceleration of the ship during pitching, and

   iii. The direction in which the bow will tend to turn when rising, if the rotation of the rotor is clockwise when looking from the left. **(16)**

(OR)

2. a) Explain four bar mechanism with suitable diagram. **(8)**

   b) Explain gyroscopic effect on inclined rotating disc. **(8)**

Unit - III

3. a) Explain the gear terminology with neat sketch. **(8)**

   b) Explain helical gear with the help of neat sketch. **(8)**

(OR)

3. Explain :

   i. Arc of contact,

   ii. Contact ratio,

   iii. Interference.

   iv. Undercutting. **(16)**

Unit - IV

4. a) Explain epicyclic gear trains with neat sketch. **(8)**

   b) Explain differential gear box with the help of neat sketch. **(8)**

(OR)

4. a) Explain Simple gear train with neat sketch. **(8)**

   b) Explain constant mesh gear box with the help of a neat sketch. **(8)**

Unit - V

5. Explain multi - cylinder inline engines and also give its applications, Advantages and disadvantages. **(16)**

(OR)

5. Explain single cylinder engines and also give its applications, Advantages and disadvantages. **(16)**

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Total No. of Questions: **Total No. of Pages:**

Roll No. _____

B.Tech.V-Sem.(Back)Exam 2024
Automobile Engg.
5AE4-02 Heat Transfer
5E1322
AE,ME

Time: 3 Hours **Maximum Marks: 120**
Min. Passing Marks: 42

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1_____ 2. _____

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q. 1 Define thermal conductivity.
Q.2 Define term NTU.What does it interpret?
Q.3 Define term intensity of radiation.
Q.4 What is Newtonian heating of solids?
Q.5 Define Kirchoff's law of radiation.
Q.6 Why thin fins are preferred over a thick fin?
Q.7 Define Grashoff Number. What are the forces associated with it?
Q.8 Define effectiveness and efficiency of a heat exchanger
Q.9 What is natural convection?
Q.10 How fin effectiveness be increased? 10 x 2 = 20

Part B(Analytical/Problem solving questions)
Attempt any Five questions

Q.1Derive three dimensional heat conduction equation in spherical coordinates considering internal heat generation.
Q.2 What is condensation? Explain its various types.
Q.3 Derive the expression for heat transfer under transient mode
Q.4.Explain N.T.U. Method.
Q.5 Explain Plank distribution law.
Q.6 Explain Lambert's law.
Q.7 Explain drop wise condensation.

5 x 8 =40

Part C(Descriptive/Analytical/Problem Solving/Design questions)
Attempt any four questions

Q. 1 Explain the Constructional and manufacturing aspects of Heat Exchangers.
Q.2 Explain counter and cross flow type heat exchanger with the help of neat sketch.
Q.3 Derive the expression for heat transfer in fins in case of
(i) Rectangular plate fin of uniform cross section
(ii) insulated end.

Q.4 A cylindrical body is 350 mm in diameter and 250 mm long. It dissipates 350 W of heat and its surface temperature is maintained at 50°C. Longitudinal fins of 10 mm thickness and 45 mm height are attached over it. Heat transfer co-efficient, $h = 50\ W/m^2K$ and the ambient temperature is 30^0C. Determine the number of fins required, if thermal conductivity of the fin material is 50W/mK.

Q.5 Calculate radiation heat transfer in:

(i) Two discs of diameter 50 cm placed parallel to each other concentrically at a distance of lm. The disc temperatures are 720°C and 220°C respectively, when no other surface present except the discs.

(ii) A 5 cm sphere at 600°C placed near an infinite wall at 100°C $4 \times 15 = 60$

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Roll No. _____ [Total No. of Pages : 2

5E1719

B.Tech. V - Sem. (Main & Back) Examination, January/February - 2024
Automobile Engg.
5AE4-02 Heat Transfer
AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** questions from **Part B** and **Three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

ALL questions are **Compulsory.** **(10×2=20)**

1. What is the function of fin?
2. State Fourier's law of conduction.
3. Define thermal diffusivity.
4. What are Biot and Fourier numbers? Explain their physical significance.
5. Draw temperature profile of a counter - flow heat exchanger.
6. What is meant by critical thickness of insulation?
7. Define Kirchoff's law of radiation.
8. Define thermodynamic boundary layer thickness.
9. Define Nusselt number.
10. What is film wise and drop wise condensation?

PART - B

(Analytical/Problem solving questions)

Attempt any FIVE questions. **(5×4=20)**

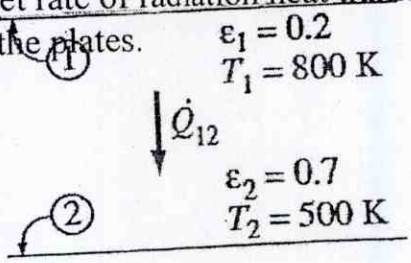
1. Distinguish between conduction, convection and radiation modes of heat transfer.
2. Define fin efficiency and fin effectiveness.
3. Write formula and physical significance of Nusselt number and Prandtl number.
4. Derive the expression for critical radius of insulation for cylinder?
5. Discuss Boiling Regimes and the Boiling curve?
6. Discuss Planck's law and wien's displacement laws?
7. State and explain Buckingham π theorem.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any THREE questions. **(3×10=30)**

1. Derive an expression for general three - dimensional heat conduction equation for general three - dimensional heat conduction equation in Cartesian coordinate.
2. Obtain an expression for the effectiveness of a counter flow heat exchanger in terms of NTU and the capacity ratio C.
3. Consider a large plane wall of thickness L = 0.4m, thermal conductivity k = 2.3 W/m°C, and surface area A= 20 m². The left side of the wall is maintained at a constant temperature of T_1 = 80°C while the right side loses heat by convection to the surrounding air at T_∞ = 15°C with a heat transfer coefficient of h = 24 W/m²°C. Assuming constant thermal conductivity and no heat generation in the wall, evaluate the rate of heat transfer through the wall.
4. Derive the expression for heat transfer rate of a very long fin and also calculate the formula for fin efficiency and fin effectiveness?
5. Two very large parallel plates are maintained at uniform temperature T_1 = 800 K and T_2 = 500 K and have emissivities are 0.2 and 0.7, respectively, as shown in Figure. Determine the net rate of radiation heat transfer between the two surfaces per unit surface area of the plates.



5E1323

Total No. of Questions: **Total No. of Pages:**

Roll No. _____

B.Tech.V-Sem.(Back)Exam Feb. 2024
Automobile Engg.
5AE4-03 Manufacturing Technology
5E1323
AE,ME

Time: 3 Hours **Maximum Marks: 120**
Min. Passing Marks: 42

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1_____ 2._____

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q. 1 Write types of tool wear.
Q.2 What is machinability?
Q.3 What is tool wear?
Q.4 What is strain rate?
Q.5 What is shear angle?
Q.6 What is shear strain?
Q.7 Define machinability index?
Q.8 Define tool life.
Q.9 What is the use of cutting fluid?
Q.10 What are the types of chips? **10 x 2 = 20**

Part B(Analytical/Problem solving questions)
Attempt any Five questions

Q.1Explain Honing process.
Q.2 Explain the factors affecting machinability.
Q.3Explain Geometry of single point cutting tool and tool angles.
Q.4.Explain the Concept of orthogonal and oblique cutting.
Q.5 Explain Magnetic pulse forming.
Q.6 Explain lapping process.
Q.7 Explain superfinishing. **5 x 8 =40**

Part C(Descriptive/Analytical/Problem Solving/Design questions)
Attempt any four questions

Q. 1 Explain Electro-hydraulic forming with the help of a neat sketch.
Q.2 Explain Gear hobbing process with the help of a neat sketch.
Q.3 Explain for Cutting fluids: Types, properties, selection and application methods.
Q.4 Explain manufacturing and selection of grinding wheels.
Q.5 Explain the Types of tool wear with the help of neat sketch. **4 x 15 = 60**

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5E1720

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5E1720

B.Tech. V sem. (Main and Back) Examination January/February- 2024
Automobile Engg.
5AE4-03 Manufacturing Technology
AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** questions from **Part B** and **Three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. Compare orthogonal and oblique cutting.
2. What are the objectives and functions of cutting fluids?
3. Draw the nomenclature of cutting tool geometry.
4. Define chip thickness ratio.
5. Name any four operations can be performed on a lathe.
6. What is the need of quick return mechanism in shaper?
7. What are the various types of gear generating process?
8. State purpose of grinding process.
9. Name any two artificial abrasive materials.
10. What is meant by Shear plane and shear angle in metal cutting?

PART - B

(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Distinguish between Capstan Lathe from Turret Lathe?
2. Discuss the various types of chips produced during metal machining.
3. Explain the following processes :
   a. Honing.
   b. Lapping.
4. What is meant by "Tool layout" of a Turret lathe?
5. What are the operations performed on a drilling machine?
6. Explain gear hobbing process over other gear generation processes.
7. Mention four important factors that influence the selection of grinding wheel.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions. **(3×10=30)**

1. Explain the Crater wear and flank wear in detail.
2. Explain the working principle of capstan and turret lathes?
3. With a simple sketch, explain the working of the crank and slotted link quick return motion mechanism used in shaper?
4. What is the tool life equation and explain the factor affecting the tool life in detail.
5. What is mean by High velocity forming methods. Explain the working principle of hydraulic forming with proper diagram?

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5E1324

Roll No. _____ [Total No. of Pages : 4

5E1324

B.Tech. V-Sem. (Back) Examination, January./February. - 2024

Automobile Engg.

5AE4-04 Design of Machine Elements I

AE,ME

Time : 3 Hours **Maximum Marks : 120**

Mm. Passing Marks: 42

Instructions to Candidates:

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly. Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory **(10×2=20)**

1. What is Resilience?
2. What BIS code 25C12S14 Indicates?
3. What are the three modes of failure?
4. What are the different applications of a knuckle Joint?
5. What is leverage, explain with a suitable diagram.
6. What failure theories you will recommend for Ductile materials & why?
7. Are Axle and spindles, type of a shaft ? Give your comment on this.
8. What are the requirements of a good coupling?
9. What do you mean by the Bolt of uniform strength
10. What are the different applications of a Power screw?

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PART - B

(Analytical/Problem solving questions)

Attempt any Five questions **(5×8=40)**

1. a) What are the Basic Requirements of a machine element? **(4)**

   b) Write short note on :-

      i) Interchangeability

      ii) Limits

2. The recommended class of fit for the hub shram k on a shaft is 50H7.s6. How ever , it is necessary to limit the Interference from 0.030 to 0.050 mm. between the hub and the shaft. specify the groups for selective assembly. **(8)**

3. It is required to design a knuckle Joint to connect two circular rods subjected to an axial tensile force of 75kN. The rods are co-axial and a small amount of angular movement between their axes is permissible Design the joint and specify the dimensions of its components. **(8)**

4. a) What are the various end conditions for a Beam design. Explain with neat diagrams. **(4)**

   b) A semi elliptic leaf spring consists of two extra full length leaves and six graduated length leaves, including the master leaf. Each leaf is 7.5 mm. thick and 50 mm wide. The centre to centre distance between two eyes is 1m. The leaves are pre-stressed in such a way that when the load is maximum stress induced in all the leases are equal to 350N/mm^2. Determine the maximum force that the spring can with stand? **(4)**

5. a) Write down the design procedure of Flange coupling. **(4)**

   b) Write down the design procedure of Flexible coupling. **(4)**

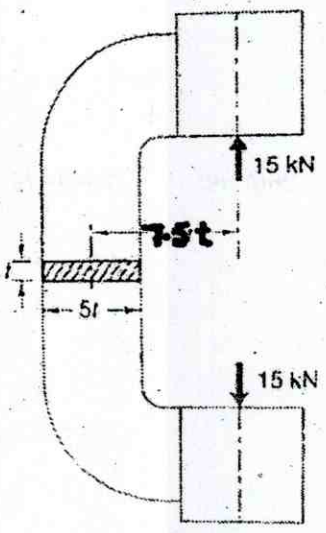
6. A double threaded power screw, with ISO metric trapezoidal threads is used to raise a load of 300 kN the nominal diameter is 100 mm. and the pitch is 12mm the coefficient of friction at the screw threads is 0.15. Neglecting collar friction, calculate.

   i) Torque required to Raise the load

   ii) Efficiency of the screw

   iii) Torque required to lower the load. **(8)**

7. AC frame subjected to a force of 15KN is shown in Fig 1. It is made of grey cast Iron FG 300 and the factor of safety is 2.5 Determine the dimensions of the cross section of the frame. (4)

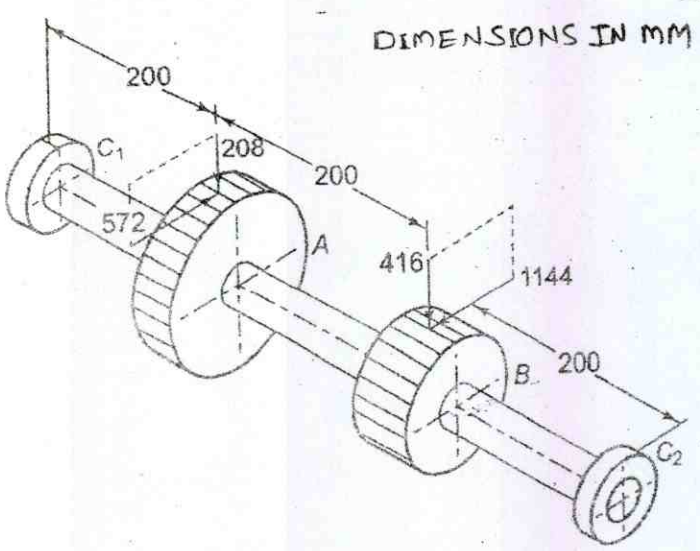


PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Four questions **(4× 15 = 60)**

1. An Intermediate Shaft of a gearbox, supporting two super years A and B and mounted between two bearings C_1 and C_2 as shown in Fig.2. The pitch circle dia. of gears A and B are 500 and 250 mm. respectively the shaft is made of Alloy Steel 20MnCr5 (Sut=620 and Syt = 480 N/mm^2) The factors k_6 and k_1 of the ASME code are 2 and 1.5 respectively. The gears are keyed to the shaft. Determine the shaft Diameter using the ASME. Code.



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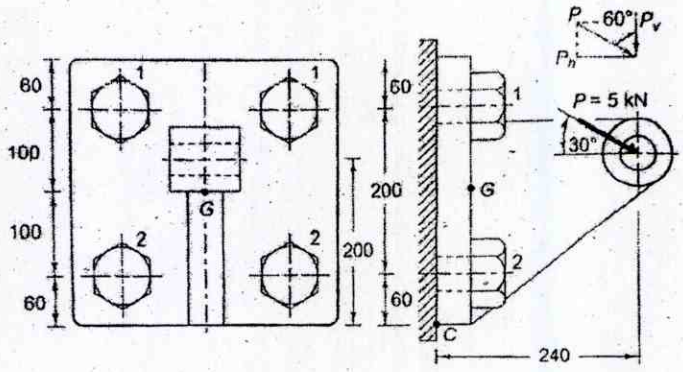
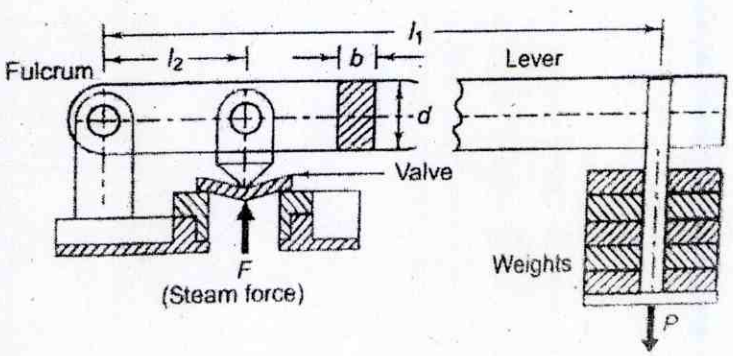
2. A bracket subjected to a force of 5KN inclined at an angle of 60 with vertical is shown in Fig. 3. The bracket is fastened by means of four identical bolts to the structure. The bolts are made of plain carbon steel 30C8 (Syt=400N/mm^2) and the factor of safety is 5. Based on maximum shear stress. Assume maximum shear stress theory and determine the size of the bolts. **(15)**



3. Design a gib and cotler Joint to resist safely a tensile load of 50kN the material of The gib, cotter and rods is same for which the allowable safe stresses are. $\sigma_c = 62N/mm^2$ $\sigma_t = 27N/mm^2$ $\sigma_s = 24N/mm^2$ **(15)**

4. Design a crank hook with the useful load lifting capacity of crane as 60 kN. The weight of the hook with grabbing tongs is 13kN. **(15)**

5. A lever loaded sofety value is mounted on the boiler to blow off at a presseure of 1.5 MPa. The effective dia of valve is 50mm. The lever as shown is fig -4 and Pin is mode of 30c8 (syt = 400 N/mm^2) and F.O.S.=5. Design a suitable lever for safety valve if permissible Bearing pressure at the pins is 25N/mm^2. The ratio of width thickness is 3:1 of a Rectangular level. **(15)**



$l_1 = 1000\,mm$
$l_2 = 100\,mm$

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5E1721

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5E1721

B.Tech. V Sem. (Main) Examination January/February - 2024

Automobile Engg

5AE4-04 Design of Machine Elements - I

AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** questions from **Part B** and **Three** questions out of **Five** questions from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205).

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory. **(10×2=20)**

1. What are the fits and tolerances?
2. What do you understand by factor of safety?
3. Write a brief note on the design of casting.
4. Explain endurance limit.
5. What do you mean by torsional rigidity?
6. List the advantages of cotter Joint over threaded Joints.
7. Define Notch sensitivity Index.
8. What do you mean by working stress?
9. Why hollow shafts are stronger than solid shafts for the same cross sectional area?
10. What is coupling?

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PART - B

(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Write short note on material selection.
2. Explain the design procedure of knuckle Joint.
3. What is key? Explain the types of keys.
4. What is 'nipping' in leaf spring? Explain what is the use of u clamp and rebound clip in leaf spring?
5. What is standardization and interchangeability of parts?
6. A shaft is transmitting 100 kw at 160 r.p.m. Find a suitable diameter for a shaft, if the maximum torque transmitted exceeds the mean by 25% take maximum allowable shear stress as 70 MPa.
7. Write down the precautions of design for assembly.

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions. **(3×10=30)**

1. Classify the engineering materials. What are main effects of C, Cr, Co, V and Mo alloying elements in sheets?
2. Design a laminated leaf spring for the following specifications Total load = 10 Tones, No. of Springs supporting load = 4

   Max, No. of leaves in a spring = 6

   Span at spring = 1.2m.

   Permissible deflection – 80mm.

   Clearly mention the material selected, sketch the spring designed.
3. Is required to design a cotter Joint to connect two steel rods of equal diameters, each rod is subjected to an axial tensile force of 50kN. Design the Joint and specifies the diamensions.
4. Explain in detail the design consideration of casting with neat sketches.
5. Design a muff coupling to transmit 6.5 kw at 1000 rpm. thc permissiblc shcar stress for shaft key and muff is 50 mpa and permissible crushing stress for key is 120 MPa.

5E1325

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Total No. of Questions:

Total No. of Pages:

Roll No. _____

B.Tech.V-Sem.(Back)Exam 2024
PCC/ PEC Automobile Engg.
5AE4-05 Principles of Management
5E1325
AE,ME

Time: 2 Hours

Maximum Marks: 80
Min. Passing Marks: 28

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.
Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.
Use of following supporting material is permitted during examination.
(Mentioned in form No.205)
1_____ 2. _____

Part A(Answer should be given up to 25 words only)
All questions are compulsory

Q. 1 Define Management.
Q.2 Define Leading.
Q.3 Define Organization.
Q.4 Define planning.
Q.5 Define productivity.

5 x 2 = 10

Part B Analytical/Problem solving questions
Attempt any four questions

Q.1Explain briefly about the various functions of Management.
Q.2 Explain the relationship of planning and controlling.
Q.3 Discuss briefly the various steps involved in organizing.
Q.4. Explain in detail about the various functions of Leader.
Q.5 Explain about the organizational culture.
Q.6 Management: Science or Art – Discuss.

4 x 10 =40

Part C(Descriptive/Analytical/Problem Solving/Design Question)
Attempt any two questions

Q. 1 What are the Henry Fayol's 14 principles of management? Explain
Q.2 Discuss in detail about the techniques used for improving Productivity.
Q.3 List the tools and techniques used in operating management system. **2 x 15 =30**

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Roll No. _____ [Total No. of Pages : 2

5E1722

B.Tech. V-Sem. (Main &Back) Examination, January/February - 2024
Automobile Engineering
5AE4-05 Principles of Management
AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART- A

(Answer should be given up to 25 words only).

All questions are compulsory. **(10×2=20)**

1. Explain the term management.
2. Define the term planning.
3. Define the term organization.
4. Define the term staffing.
5. Write the different period of management.
6. Explain the term job enrichment.
7. Elaborate the term total quality management.
8. Write the basic steps involved in the process of controlling.
9. Explain the term Flexible Budget.
10. Write the advantages of performance Appraisal.

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PART - B
(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Describe the Fayol's General Principles of Management.

2. Write the eight applicable steps in planning which should be followed by managers.

3. What is motivation? Explain needs want-satisfaction chains.

4. Mention the various elements in the process of communication.

5. Explain the ingredients of leadership in details.

6. What is basic control process? Explain different types of standard in details.

7. What is management by object? Explain its benefits and weaknesses.

PART - C
(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions. **(3×10=30)**

1. Write the elements of Scientific Management techniques given by Taylor, explain them in details.

2. Explain the several factors which influence the span of management.

3. Write short notes on i) Bill Gates and ii) Dhirubhai Ambani.

4. What is an organization structure? Describe its effect with respect to any two companies.

5. Explain the co-operative enterprise, private limited company, public limited company, public sector enterprise and public corporation in details.

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5E1327

Total No. of Questions: Total No. of Pages:

Roll No. _____

B.Tech.V-Sem.(Back)Exam Feb. 2024
Automobile Engg.
5AE5-12 Automobile Engineering
5E1327
AE,ME

Time: 3 Hours **Maximum Marks: 120**
Min. Passing Marks: 42

Attempt all ten questions from Part A, five question out of seven from Part B and four questions out of five from Part C.
Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/ calculated must be stated clearly.
Use of following supporting material is permitted during examination. (Mentioned in form No.205)

1._____ 2._____

Part A (Answer should be given up to 25 words only)
All questions are compulsory

Q. 1 Define Automobile. Give the typical specifications of an automobile
Q.2 What are the functions of frame?
Q.3 State the function of a clutch.
Q.4 What is the need for gearbox in an automobile?
Q.5 What is the purpose of the pressure plate in a clutch?
Q.6 Write types of gear boxes?
Q.7 What is meant by traction control?
Q.8 State the function of differential unit.
Q.9 What is the use of shock absorbers?
Q.10 What is the use of Torque convertor. 10 x 2 = 20

Part B(Analytical/Problem solving questions)
Attempt any Five questions

Q.1Explain Automatic transmission system.
Q.2 Write about single plate clutch and multi plate clutch in detail?
Q.3 Explain Magneto and coil ignition systems.
Q.4.Explain Battery Charging System.
Q.5 What are the different loads acting on chassis and explain briefly?
Q.6 Explain Hydraulic torque converter.
Q.7 . Explain the working of ignition system with its own electric generator to provide the required necessary energy for the vehicle system.

5 x 8 =40

Part C(Descriptive/Analytical/Problem Solving/Design questions)
Attempt any four questions

Q. 1 Explain the working principle of synchromesh gear box with neat sketch.
Q.2 Discuss the constructional details of a cross ply tyre .Also explain Tyre wear, their causes and Re-treading of the tyre.
Q.3 Explain the term "Backlash" in Steering Gear. Write the common procedure adopted to adjust the backlash in steering gear.
Q.4 Explain NVS (Night Vision System).
Q.5 Explain Automobile Air conditioning system with suitable example. 4 x 15 = 60

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5E1724

B.Tech. V-Sem. (Main & Back) Examination, January/February - 2024
Automobile Engineering
5AE5-12 Automobile Engineering (Elective-I)
AE, ME

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all Ten questions from Part A, Five questions out of Seven questions from Part B and Three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No.205)

PART - A
(Answer should be given up to 25 words only).

All questions are compulsory. **(10×2=20)**

1. What is clutch? Also name different types of dry friction clutches?
2. What is the importance of automatic transmission?
3. What is the purpose of all wheel drive?
4. What is the mechanism of drive shaft?
5. What is the importance of suspension system in vehicle?
6. Define steering axis inclination.
7. Name various safety features available in automobile.
8. What is full floating rear axle?
9. How torque convertor produces the effect of gear ratio?
10. What is the difference between chassis and frame?

PART - B
(Analytical/Problem solving questions)

Attempt any Five questions. **(5×4=20)**

1. Discuss the qualities of good clutch, explain the construction of single plate clutch.

2. Describe the working of synchromesh gearbox with the help of neat sketch. Why is synchronizer ring is used in these gearboxes?

3. Explain the terms: Camber, Castor and Toe-In. What is the effect of each on the steering characteristics of a vehicle?

4. An automobile clutch has a clutch plate of 160 mm inside and 240 mm outside diameters. Six springs in the clutch provide a total force of 4.8 kN, when the clutch is new and each spring is compressed 5mm. The maximum torque developed by the automobile engine is 250N-m. Determine
   i) Factor of safety for the new clutch and
   ii) The amount of wear of the clutch facing that will take place before the clutch starts slipping. Assume coefficient of friction for the facing is 0.3

5. Explain the working of battery ignition system and compare it with magneto ignition system.

6. What is the use of global positioning system in automobile? How does it work?

7. Two shafts A and B, whose axes are intersecting but inclined to each other at 15^0 are connected by means of a Hooke's joint. A flywheel of weight 180 kN and radius of gyration 80mm is fitted to shaft B. If the shaft A rotates at uniform speed of 2000 r.p.m, what is the maximum torque in B?

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any Three questions. **(3×10=30)**

1. Explain various battery testing procedures in detail.

2. Draw neat sketch of worm and roller steering gear and compare it with worm and ball bearing nut type steering gear.

3. Discuss the principle of operation of a vacuum clutch.

4. A single plate clutch, with both sides effective, has outer and inner diameters 300 mm and 200 mm respectively. The maximum intensity of pressure at any point in the contact surface is not to exceed 0.1 N/mm^2. If the coefficient of friction is 0.3,determine the power transmitted by a clutch at a speed of 2500 r.p.m.

5. Explain Ackerman steering mechanism with neat sketch. The front axle of a car has pivot centers 1.1 m apart. The length of each steering arm is 150 mm, while the track rod is of 1.0 m length. Calculate the wheelbase for perfect rolling of the car wheels when the inner wheel stub axle is at 55^0 to the rear center line.