

Sai Nath University

Assignment For Diploma in Mechanical Engineering IVth Sem.

The Assignment will consist of two parts, A and B. Part A will have 5 short answer questions(40-60 words) of 4 marks each. Part B will have 2 long answer questions of 10 marks each

All questions are compulsory.

These Assignments should be completed and submitted in written form by the student to his/her respective Faculty/ Examiners. Assignment Submission Dates are:

➤ June-18

List Of Suggested Questions

The list of suggested questions are for students to practice. Although optional, we recommend that students solve these questions, as they will help them in preparing for exams as well as in clearing the important concepts of the subject.

List of Practical and suggested practical's

The list of practical's should be done by the students in their Lab Sessions. These are the basic practical's, which each student should be able to do himself independently. While the list of suggested practicals are optional, but it is recommended that students should perform those practical so as to have a thorough knowledge of the subject

Education Delivery Schedule (EDS)

As per University Semester scheme, the minimum contact hours of each paper has been Divided into two hours theory and practical class.

The faculty will maintain this attendance paper wise for his/her batch.

Subject Code

Subject Name

DEME-401

Applied Electronics

DEME-402

Theory Of Machines

DEME-403

Manufacturing Process

DEME-404

Mechanical Engg.Drawing

DEME-405

Thermal Engineering

DEME-406

Practical



SAI NATH UNIVERSITY

Cover page of Assignment

ID NUMBER

NAME

COURSE Diploma Engineering.....

STREAM Mechanical.....

SEM 4th

SUBJECT CODE

SUBJECT NAME

Assignments will be completed by the Student in his/her own handwriting.

DEME-401

[Applied Electronics]

Part A

1. Write short notes on any two of the following :
 - (a) Voltage multiplier
 - (b) Clamper
 - (c) Filters
2. Explain the operation of a transistor as an amplifier clearly discussing each concerned formula?
3. How does a JK flip-flop differ from an S-R flip-flop in its basic operation ? With neat diagram explain the working of a Master-Slave JK flip-flop.
4. Define Rectifier . And write in brief about-
 - (a) Half wave rectifier
 - (b) full wave rectifier
 - (c) Bridge type rectifier
5. What is an operational amplifier, draw its block diagram write about its configuration and write its simple application as adder and subtractor.

Part B

1. (a) What do you mean by a Unit distance code ? Write any such 4-bit code.
 - (b) Given that $16_{10} = 100_b$, find the value of b.
 - (c) State and prove DeMorgan's theorem.
2. Define:-
 - (a) Encoder
 - (b) Decoder
 - (c) Multiplexer
 - (d) Demultiplexer
 - (e) Shift register
 - (f) counters

DEME-402
[Theory Of Machines]
Part A

1. Outside diameter of a square threaded spindle of a screw jack is 40 mm. The screw pitch is 10 mm. If the co-efficient of friction between the screw and the nut is 0.15, neglecting friction between the nut and the collar, determine :
 - (a) Force required to be applied at the end of Tommy-bar 1 m in length to raise a load of 20 kN.
 - (b) Efficiency of the screw.
2. Write short notes on any two of the following :
 - (a) Causes of vibrations and their harmful effects
 - (b) Insensitiveness in the governors
 - (c) Power Transmission devices.
3. The arms of a Porter governor are 25 cm long and pivoted on the governor axis. The mass of each ball is 5 kg and mass on central load of the sleeve is 30 kg. The radius of rotation of balls is 15 cm when the sleeve begins to rise and reaches a value of 20 cm for the maximum speed. Determine speed range.
4. In a slider-crank mechanism, the lengths of the crank and the connecting rod are 200 mm and 800 mm respectively. Locate all instantaneous centres of the mechanism for the position of the crank when it has turned 30° from inner dead centre position. Also find the velocity of the slider and the angular velocity of the connecting rod if the crank rotates at 40 rad/sec.
5. (a) Compare belt drive with chain drive. Also give three applications of each drive.
 - (b) Derive the relation between friction tensions on tight and slack side of flat belt drive.

Part B

1. Explain clearly the terms static and dynamic balancing.
2. What is brake , write about functions of brakes and types of brakes.

DEME-403
[Manufacturing Processes]
Part A

1. What are the different types of mould sand testings ? Explain them briefly.
2. What are the different types of pattern making allowances ? Explain why these allowances are required in moulding.
3. Explain the following with sketch :
 - (a) Resistance projection welding
 - (b) Spot welding.
4. What are the basic requirements of a proper moulding sand ?
5. What are the different types of surface finishing processes ? Explain any two in detail with sketch.

Part B

1. Explain the following with sketch :
 - (a) Resistance projection welding
 - (b) Spot welding.
2. Describe the effect of temperature on sheet metal working. Explain the difference between hot working and cold working of metal.

DEME-404
[Mechanical Engg. Drawing]

Part A

1. (a) Describe the different types of sectional views. Explain each one of them by a suitable example.
(b) Develop the half sectional view of the 8 upright hollow circular cone of height 1 cm with 3 cm and 4 cm internal and external diameter respectively.
2. (a) What is meant by cotter and when it is used? With a neat sketch define the purpose of using a gib along with a cotter in a cotter joint.
(b) Sketch the following thread profiles for a 7 nominal diameter of 25 mm and pitch 3 mm and give their applications :
 - (i) BSW thread
 - (ii) ACME thread
 - (iii) Buttress thread
 - (iv) Worm thread
3. Describe the ways in which a riveted joint may fail. What steps are taken to prevent failures? Illustrate your answer with necessary sketches.
4. Name different types of pulleys? What is meant by fast and loose pulleys? Explain its working principle.
5. Write short notes on any two of the following :
 - (a) Locking arrangements of nuts
 - (b) Forms of screw threads
 - (c) Rigid coupling Vs Flexible coupling
 - (d) Boiler joint.

Part B

1. A square pyramid of base 40 mm side and axis 147 mm long rests with its base on H.P. with all the edges of the base equally inclined to V.P. It is cut by a section plane inclined at 60° to the H.P. and passing through a point on the axis at 30 mm from the base. Draw the sectional top view and front view of the pyramid..
2. Draw an isometric projection of the frustrum of a hexagonal pyramid having base side 40 mm, top side 25 mm long and height 60 mm long.

DEME-405
[Thermal Engineering]
Part A

1. What is the fundamental difference between the operation of impulse and reaction turbines ? Explain the same with neat sketches.
2. Compare in detail. Four stroke and two stroke IC engines.
3. A six cylinder gasoline engine operates on 4 stroke cycle. The bore and stroke of each cylinder are 80 mm and 100 mm respectively. At a speed of 4000 rpm, the fuel consumption is 20 kg/hr and torque developed is 150 Nm. Calculate :
 - (a) Brake power
 - (b) Brake mean effective pressure
 - (c) Brake thermal efficiency.
4. Write short notes on the following :
 - (a) Knock in CI engines
 - (b) Working principle of single acting single stage reciprocating air compressor.
5. (a) Define a thermodynamic system. Explain different types of thermodynamic systems with suitable examples.
 - (b) Derive the equation for work done during an isothermal process.

Part B

1. (a) A boiler generates 5000 kg/hr of steam at 16 bar and 300°C from feed water at 30°C. Coal used is 600 kg/hr with calorific value of 30000 kJ/kg. Determine :
 - (i) Equivalent of evaporation
 - (ii) Boiler efficiency
- (b) Compare water tube boilers and fire tube boilers..
2. Write short notes on the following terms :
 - (a) Fuels used for Gas turbines
 - (b) Multistage Compression.

DEME-406
[Practical]
Part A

1. A rod AB carries three loads of 30 N, 90 N and 100 N at distances of 20 mm, 90 mm and 150 mm respectively from A. Neglecting the weight of the rod, determine the point at which the rod will balance.
2. With the help of a neat sketch, explain the following :
 - (i) Twist Drill
 - (ii) Centre Drill
3. Explain the working principle of column and knee type machine, with the help of a neat sketch.
4. Differentiate between the working principle of Shaper and Planer machine. What types of surfaces can be produced on Shaper and Planer ?
5. What are the various steps involved to make a hexagonal bolt by straddle milling ? Explain with the help of a neat sketch.

Part B

- 1.a) Explain the Green sand moulding methods in Casting.
 - b) What are the special patterns and how are they differ from other patterns ?
 - c) Describe the process of making a core.
2. Explain the functions of the following components of a slotting machine :
 - (a) Column
 - (b) Saddle
 - (c) Rotating table
 - (d) Feed mechanism
 - (e) Tool head assembly