1370 **Code : 20AT11T**

Register Number | | | | | | | | | | |

I Semester Diploma Examination, June/July-2023

MECHANICAL SCIENCE & ENGINEERING

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (1) Answer **one** full question from each section.
(2) **One** full question carries **20** marks.

SECTION – I

1. (a) List the five types of non-ferrous metals. **5**

   (b) Write any five mechanical properties of metals. **5**

   (c) Discuss the following process of heat treatment : **5+5=10**

   (i) Normalizing

   (ii) Hardening

2. (a) Mention any five properties of copper. **5**

   (b) Demonstrate the annealing process. **5**

   (c) Write any five properties of plastic & five applications of rubber. **5+5=10**

SECTION – II

3. (a) Compare ferrous & non-ferrous metals. **5**

   (b) Define the shaft and list the types of shafts. **5**

   (c) Explain the flange coupling with neat sketch. **10**

4. (a) List the types of keys. 5

(b) Classify the bearings. 5

(c) Sketch and explain the muff coupling. 5+5=10

SECTION – III

5. (a) List the properties of materials used for shafts. 5

(b) Explain the woodruff key with sketch. 5

(c) Explain the slip and creep of the belt. 5+5=10

6. (a) List any five types of gears. 5

(b) Classify the gears on different parameters. 5

(c) Explain the open belt drive with a neat sketch. 10

SECTION – IV

7. (a) Name the different types of belt drives. 5

(b) Select the suitable drive for a motor cycle. Justify your selection. 5

(c) Explain the following with sketch :

(i) Through Bolts

(ii) Studs 5+5=10

8. (a) Define the following terms of Screw Thread : 5

(i) Major diameter

(ii) Minor diameter

(iii) Pitch

(iv) Crest

(v) Root

(b) Explain the Jam nut or Lock nut with sketch. 5

(c) Compare the IC Engine with EC Engine. 10

SECTION – V

9. (a) State the advantages of four stroke engine over two stroke engine. 5

(b) What is meant by Engine speed and Engine torque ? 5

(c) (i) Classify the Internal Combustion (IC) Engines based on different parameters (any five).

(ii) Define two stroke engine and four stroke engine. 5+5=10

10. (a) Compare the SI and CI engines. 5

(b) Explain the construction and working of four stroke SI engines with sketches. 10

(c) Sketch and label the parts of a two stroke SI engine. 5

1081

Code : 20AT11T

Register Number

I Semester Diploma Examination, December-2023

MECHANICAL SCIENCE AND ENGINEERING

Time : 3 Hours] **[Max. Marks : 100**

Instructions : (i) Answer **one** full question from each Section.

(ii) **One** full question carries **20** marks.

SECTION – I

1. (a) (i) List any five applications of Engineering Materials. **5**

(ii) List the five properties of Steel. **5**

(b) (i) List any five types of Copper alloy. **5**

(ii) List any five applications of composite materials. **5**

OR

2. (a) (i) List any five applications of Cast Iron. **5**

(ii) Explain any five types of non-ferrous metals. **5**

(b) (i) Choose the suitable material for the pipes by identifying the properties of plastics. **5**

(ii) Explain any five Heat treatment techniques. **5**

SECTION – II

3. (a) Define square sunk key with their neat sketch. **5**

(b) Write the advantages of muff couplings. **5**

(c) List any five functions of Bearing. **5**

(d) Draw a neat sketch of Roller Bearing. **5**

OR

4. (a) Draw a neat sketch of Round Keys. **5**

(b) List types of keys. **5**

(c) Mention the advantages of flange coupling. **5**

(d) Classify the bearings. **5**

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SECTION – III

5.	(a)	Mention types of Belt drives with their speeds.	5
	(b)	Draw a neat sketch of crossed belt drives.	5
	(c)	Explain the velocity ratio of gear drives.	5
	(d)	Draw a neat sketch of worm and worm wheel.	5

OR

6.	(a)	Classify the Gears.	5
	(b)	Write any five advantages of chain drives.	5
	(c)	Draw a neat sketch of compound belt drive.	5
	(d)	List the selection of Be H drives.	5

SECTION – IV

7.	(a)	Explain screw thread terminologies with a neat sketch.	10
	(b)	Draw a neat sketch of split pin locking using castle nut.	5
	(c)	Classify the Riveted Joints.	5

OR

8.	(a)	Write any five applications of Copper.	5
	(b)	Draw neat sketch of Woodruff keys.	5
	(c)	Compare EC and IC Engine.	5
	(d)	Draw neat sketch of Two stroke SI engine.	5

SECTION – V

9.	(a)	Mention types of engines.	10
	(b)	Draw and define swept volume, compression ratio, clearance volume, total volume, indicated power.	10

OR

10.	(a)	With neat sketch explain the construction and working of four stroke petrol engine.	10
	(b)	With neat sketch explain the construction and working of two stroke diesel engines.	10