

Scheme - I
Sample Question Paper

Program Name : Diploma in Automobile Engineering
Program Code : AE
Semester : Third
Course Title : Materials and Manufacturing Processes
Marks : 70

22307

Time: 3 Hrs.

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following.

10 Marks

- a) State four types of engineering materials.
- b) Define heat treatment.
- c) State two advantages and disadvantages of foundry process.
- d) State four properties of cutting tool material.
- e) Define depth of cut and tool life in machining process.
- f) State gang milling operation with sketch.
- g) Classify drilling machine.

Q.2) Attempt any THREE of the following.

12 Marks

- a) Distinguish between ferrous & non ferrous metals with respect to main constituent, Conductivity, resistance to corrosion, machinability.
- b) Explain heat treatment processes with its Significance.
- c) Explain two types of foundries.
- d) With the help of sketch explain any four types of mandrel used on lathe machine.

Q.3) Attempt any THREE of the following.

12 Marks

- a) Discuss the properties & applications of AZ31 titanium alloys
- b) Identify the properties of the material used for connecting rod with justification
- c) Describe annealing process with its significance.
- d) Describe working of hot chamber die casting with applications.

Q.4) Attempt any THREE of the following.

12 Marks

- a) Identify properties of the glass fiber (GRP) material when used for Disc cover with justification.
- b) Illustrate the Iron-Iron carbide (Fe-Fe₃C) diagram showing critical temperature on it.
- c) Apply proper heat treatment process for manufacturing motor cycle parts & agriculture machinery with justification.
- d) Describe the true centrifugal casting process applicable to manufacture cylindrical pipes.
- e) Use suitable pattern for production of circular parts in foundry process.

Q.5) Attempt any TWO of the following.

12 Marks

- a) Write type of chip formed during following factor with justification:
 - i. Low rake angle.
 - ii. High cutting speed
 - iii. Small depth of cut
 - iv. Low cutting speed
 - v. Large depth of cut
 - vi. Low rake angle
- b) Explain the meaning of single point cutting tool 0 – 7 – 6 – 8 – 15 – 16 – 0.8 according to ASA system.
- c) Choose proper operation method used on lathe machine for following requirements with justification: (any six)
 - i. produce angle on job
 - ii. provide grip on job
 - iii. enlarging previously drilled hole
 - iv. producing a hole
 - v. cutting the job
 - vi. finishing previously drilled hole

Q.6) Attempt any TWO of the following.

12 Marks

- a) Describe the nomenclature of drilling machine multi point cutting tool.
- b) Use suitable lathe operation for manufacturing 20° taper on a job with justification.
- c) Describe the safety precautions to be taken during step turning of axle on lathe machine.

Scheme - I
Sample Test Paper - I

Program Name : Diploma in Automobile Engineering
Program Code : AE
Semester : Third
Course Title : Materials and Manufacturing Processes
Marks : 20

22307

Time: 1 Hours

Instructions:

- (1) All questions are compulsory.
- (2) Illustrate your answers with sketches wherever necessary.
- (3) Figures to the right indicate full marks.
- (4) Assume suitable data if necessary.
- (5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) Name the constituent of 18–4–1 H.S.S. and give its two industrial applications.
- b) List industrial applications of AZ31 titanium alloys.
- c) List advantages of flame hardening process.
- d) Define heat treatment.
- e) State selection criteria of pattern materials.
- f) Identify two causes of casting defects and suggest their remedial measure.

Q.2 Attempt any THREE.

12Marks

- a) Classify plain carbon steels with compositions.
- b) Explain glass fiber (GRP/GFRP) with properties and applications.
- c) Explain gas carburizing process with sketch.
- d) Describe two allowances used in pattern making.
- e) Describe use of swage block and anvil block with sketch.
- f) Explain shell moulding process with applications.

Scheme – I
Sample Test Paper - II

Program Name : Automobile Engineering Program Group
Program Code : AE
Semester : Third
Course Title : Materials and Manufacturing Processes
Marks : 20

22307

Time: 1 Hour

Instructions:

- 1) All questions are compulsory.
- 2) Illustrate your answers with neat sketches wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR.

08 Marks

- a) State four properties of cutting tool material.
- b) Define speed & feed in machining process.
- c) Name four cutting fluid used in machining process.
- d) List the any four principal parts of column & knee type universal milling machine.
- e) State functions of any two lathe machine parts.
- f) Classify drilling machine.

Q.2 Attempt any THREE.

12Marks

- a) Distinguish between orthogonal & oblique cutting method with respect to definition, chip formation, cutting edge action, and tool life.
- b) Explain mechanism of chip formation process with sketch.
- c) Explain properties of cutting fluid used for machining mild steel material.
- d) Explain taper turning by swiveling the compound rest method.
- e) Explain reaming and boring operation performed on drilling machine.
- f) Differentiate between up milling and down milling on basis of cutter direction, alternate name, chip thickness, surface finish.