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10017

Reg. No.:_____ Name: _____

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2016

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each question carries 3 marks

1. "No engine can be made to work on Carnot cycle" Justify the statement.
2. What will happen, when diesel fuel is accidentally filled to a petrol car?
3. You are appointed as an engineer in a refrigerator manufacturing company and are assigned by a task of selecting the refrigerant. While selecting the refrigerant point out the desirable properties you consider?
4. Carburetor engines are now being replaced by MPFI engines. Comment.
5. List out the different processes involved in powder metallurgy in the correct order.
6. List out any six important properties of moulding sand.
7. Identify the main operations which can be performed by a Lathe.
8. What is the principle of operation of a planer?

(8 x 3 = 24 Marks)

PART B

Answer any 2 complete questions each having 6 marks

9. Draw the P-V and T-S diagram of a Carnot cycle and explain the processes.
10. In a constant volume 'Otto cycle', the pressure at the end of compression is 15 times that at the start, the temperature of air at the beginning of compression is 38 ^{O}C and maximum temperature attained in the cycle is 1950 ^{O}C. Determine (i) Compression ratio (ii) Thermal efficiency of cycle (iii)Work done per kg of air. Take γ for air =1.4
11. Explain the principle of increase of entropy.

Answer any 2 complete questions each having 6 marks

12. With the help of a neat sketch explain the working of a reciprocating compressor.
13. Compare the working of two stroke and four stroke internal combustion engines.

14. How is steam produced in a fire tube boiler? Explain with a neat figure.

Answer any 2 complete questions each having 6 marks

15. Write a short note on impact of refrigerants on environment.
16. Demonstrate the working of a vapour compression refrigeration system with the help of a neat sketch.
17. Distinguish between window air conditioner and split air conditioner.

Answer any 2 complete questions each having 6 marks

18. Explain the working of a cone clutch in an automobile.
19. Sketch different types of gear trains and explain.
20. Explain the different types of brakes.

PART C

Answer any 2 complete questions each having 7 marks

21. Discuss the various properties of engineering materials.
22. In a certain fabrication industry, they want to join two dissimilar metal pipes, which method should they follow? Justify.
23. Differentiate between welding, brazing and soldering.

Answer any 2 complete questions each having 7 marks

24. Draw the neat sketch of a lathe and explain its principle parts.
25. Explain the working principle of a shaping machine.
26. With a neat sketch, explain a drilling machine.

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Reg. No. : ..... Name : .....

SECOND SEMESTER B.TECH. DEGREE EXAMINATION, MAY/JUNE 2016

ME100 : BASICS OF MECHANICAL ENGINEERING

Max. Marks : 100 Duration : 3 Hours

PART – A

Each question carries **3** marks :

1. Discuss the first law of thermodynamics applied for a process.
2. Why compression ratio of petrol engine is low compared to diesel engines ?
3. Differentiate between DBT and WBT.
4. What are the desirable characteristics of a good fuel ?
5. Why alloys are preferred over pure metallic materials in engineering applications ?
6. Discuss how thin sheets are manufactured ?
7. Mention the importance of forging.
8. List and explain any three operations performed on drilling machine.

PART – B

Answer **any two** questions from **each** Module.
Each question carries **6** marks.

Module – I

9. State and explain second law of thermodynamics. Give its application.
10. An engine operation on an air standard Otto cycle has a compression ratio equal to 7. The conditions at the start of compression are 0.1 MPa and 300 K. The pressure at the end of heat addition is 4 MPa. Determine :
    i) thermal efficiency
    ii) net work done where $C_V = 0.718$ kJ/kg, $\gamma_{air} = 1.4$.
11. Sketch and explain the ideal cycle for petrol engines.

P.T.O.

Module – II

12. Explain with neat sketch the working of a petrol engine that produces power in a single revolution.

13. With neat sketch explain the working of centrifugal air compressor.

14. Differentiate between air motors, blowers and compressors.

Module – III

15. What are the two types of refrigeration systems ? How they differ between each other in terms of the working principle ?

16. Differentiate between summer and winter air conditioning.

17. Sketch the different processes in a psychometric chart and discuss.

Module – IV

18. Discuss the classification of IC Engines.

19. Explain about MPFI, CRDI and Hybrid engines.

20. What are the different types of drives used for power transmission in an IC engine and compare between them ?

PART – C

Answer **any 2** questions from **each** Module.

Each question carries **7** marks.

Module – V

21. Write down the procedure for developing a mould for a component.

22. Discuss any two metal joining process.

23. Name five alloys and their applications.

Module – VI

24. Differentiate between NC and CNC machines.

25. Identify the parts of lathe shown in Figure 1 and explain the various operations that can be performed on the lathe.

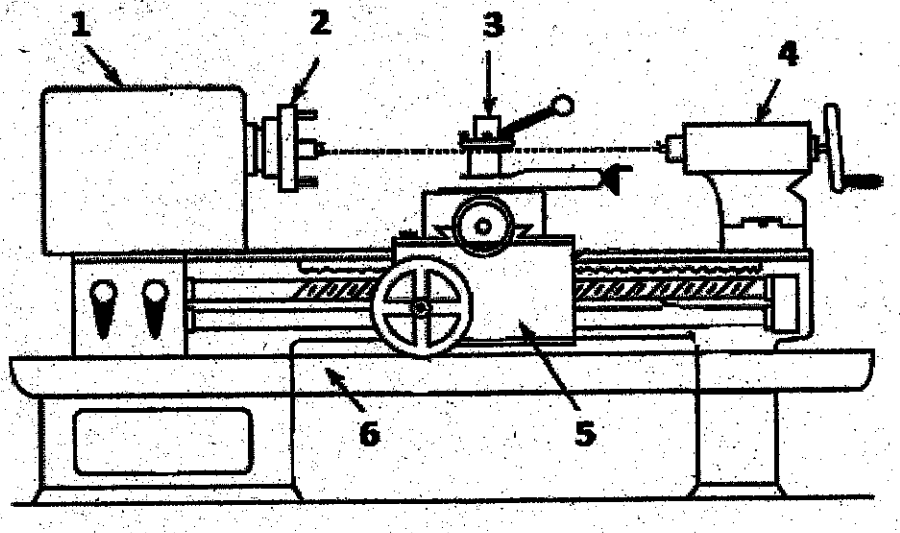

Figure 1

26. Discuss the operations which can be performed on a drilling machine.

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10018

Reg. No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, JULY 2016

ME100 BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer ALL questions. Each question carries 3 marks

1. "Entropy of the universe is increasing". Comment.
2. Write any three differences between fire tube and water tube boilers?
3. Differentiate between comfort and industrial air conditioning.
4. Bring out the concept of hybrid vehicles.
5. Give examples of three alloys and state their applications.
6. Differentiate between soldering and brazing.
7. List the applications of milling machine.
8. List any six machining operations that are performed on a lathe.

PART B

Answer any 8 Questions (2 QUESTIONS FROM EACH MODULE)
Each question carries 6 marks

MODULE I

9. State the first law of thermodynamics for a process and cycle. Bring out the limitations
10. Sketch a Brayton cycle and explain.
11. A Carnot cycle works with adiabatic compression ratio of 5 and isothermal expansion ratio 2. The volume of air at the beginning of isothermal expansion is 0.3 m3. If the maximum temperature and pressure is limited to 550 K and 21 bar, determine (a) minimum temperature in the cycle, (b) thermal efficiency of the cycle, (c) pressure at all salient points. Take $\gamma = 1.4$.

MODULE II

12. Differentiate between fan, blowers and compressors.
13. Discuss the working of a four stroke SI engine.
14. With a neat sketch explain the working of centrifugal pump.

MODULE III

15. Explain the working of vapour compression refrigeration system.

16. Explain about the different refrigerants used and their impacts on the environment
17. With the help of psychrometric chart explain various psychrometric processes.

MODULE IV

18. Discuss on CRDI and MPFI technology.
19. How can you arrange gears for transmitting power from one shaft to another?
20. Illustrate the working single plate clutch.

PART C

Answer any 4 questions (ANY 2 QUESTIONS FROM EACH MODULE)
Each question carries 7 marks

MODULE V

21. Write short notes on (i) Forging (ii) Rolling
22. Which manufacturing process uses mould to produce desired parts? And list out all possible defects during this process.
23. What is powder metallurgy? What are the basic steps of powder metallurgy?

MODULE VI

24. Describe a milling machine.
25. Explain the merits of CNC machine over conventional machine.
26. Shaper is used to produce flat surfaces, explain the principal parts assist to produce flat surfaces?

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10019

Reg. No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, SEPTEMBER 2016

ME100 BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer ALL questions. Each question carries 3 marks

1. State the second law of thermodynamics.
2. Which pump requires priming? What is the need for priming?
3. The door of your refrigerator is kept open inside a room. What will happen? Justify your answer.
4. Name few hybrid vehicles in India and mention its importance.
5. Briefly describe Rolling process
6. A designer is planning to design a sand mould without a riser. Can he achieve the casting successfully using this design and validate your answer.
7. A manufacturer demanded his lathe operator to put grip on his product. Suggest an operation to operator for performing the same? And explain the process?
8. Give the differences between a shaper and a planar.

PART B

Answer any 8 Questions (2 QUESTIONS FROM EACH MODULE)
Each question carries 6 marks

MODULE I

9. Explain the significance of Clausius inequality.
10. Sketch a Diesel cycle on P-V and T-S diagram and explain.
11. An engine operating on Carnot cycle between temperature limits $20^{o}C$ and $800^{o}C$ rejects heat at the rate 200 KJ/s. Determine (i)the ideal thermal efficiency of the cycle. (ii) Power output of the engine.

MODULE II

12. With a suitable sketch explain the working of a gas turbine.
13. Identify and explain the engine that gives one power stroke for two revolution of crank shaft
14. With a suitable sketch explain the working of a centrifugal pump.

MODULE III

15. Explain the working of a vapour absorption refrigerator with a suitable sketch.

16. Explain the working of a domestic refrigerator with a suitable sketch.
17. Explain the working of a split air conditioner with a suitable sketch.

MODULE IV

18. List out major components in an automobile with their functions.
19. Explain the different types of power transmission drives.
20. A good fuel for an SI engine will be a bad fuel for a CI engine. Comment. .

PART C

Answer any 4 questions (ANY 2 QUESTIONS FROM EACH MODULE)
Each question carries 7 marks

MODULE V

21. With neat sketch, explain sand casting process.
22. Briefly describe different types of rolling mills with sketches.
23. Describe the forging process with sketches.

MODULE VI

24. Explain the working of a drilling machine with the help of a neat diagram.
25. Sketch a milling machine and indicate the important components in it.
26. Describe a shaper with a neat diagram.

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Reg. No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

ME100 : BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions

1. a) Discuss different modes of heat transfer. (3)
   b) Differentiate between enthalpy and entropy. (3)
   c) Derive an expression for the air standard efficiency of Otto cycle. (9)
2. a) Differentiate between closed and open cycle type of gas turbines. (3)
   b) Explain the term cavitation. (3)
   c) With the help of a neat diagram, explain the working of an SI engine which develops one power stroke during two crank rotations. (9)
3. a) Discuss the various functions of a draft tube. (3)
   b) Explain the term Specific heat at constant volume and constant pressure.(3)
   c) In an ideal diesel cycle, the temperature at the beginning and end of compression is 65^0C and 620^0C respectively. The temperature at the beginning and end of the expansion is 1850^0C and 850^0C. Determine the ideal efficiency of the cycle. Take γ = 1.4. If compression ratio is 15 and pressure at the beginning is 1 bar, calculate the maximum pressure in the cycle. (9)

PART B

Answer any two questions

4. a) Differentiate between the COP and efficiency of a system. (3)
   b) Differentiate between vapor compression refrigeration system and vapor absorption refrigeration system. (3)
   c) With the help of a suitable sketch explain the working of a split air conditioner; also mention the advantages over window air conditioning system. (9)
5. a) List various advantages of chain drives. (3)
   b) Explain the working of a simple carburetor. (3)
   c) Discuss any two types of braking mechanisms commonly used in automobiles (9)

6. a) Explain the different functions of a clutch. (3)

   b) Explain different classifications of IC engines. (3)

   c) Explain the working of belt drive and gear drive with the help of neat sketches. (9)

PART C

Answer any two questions

7. a) Explain the functions of runners and risers used in casting. (5)

   b) Explain the processes involved in powder metallurgy. (5)

   c) Explain the method employed for making metal sheets/plates in manufacturing process. Also discuss their classification and types. (10)

8. a) List out any four operations that can be performed on a drilling machine. (5)

   b) State various advantages of CNC machines over conventional machines.(5)

   c) With the help of suitable sketch explain the principle parts of a lathe. (10)

9. a) Differentiate between brazing and soldering. (5)

   b) Discuss various advantages of grinding process. (5)

   c) With neat sketches explain about working and various operations that can be performed on a milling machine. (10)

Reg. No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SECOND SEMESTER B.TECH DEGREE EXAMINATION, JUNE2017

ME100: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any TWO full questions.

1) a. Derive an expression for the air standard efficiency of a diesel cycle. **(10)**

   b) In an otto cycle, at the beginning of the compression air is at $27^{o}C$ and 1 bar. The clearance volume is 20% of the swept volume. Find

   i) Air standard efficiency.

   ii) Temperature at the end of compression. **(5)**

2) a. Give the two statements of the second law of thermodynamics and show their equivalence. **(10)**

   b. Compare and contrast impulse and reaction steam turbines. **(5)**

3) a. Describe the working of any one type of boiler with a neat sketch. **(10)**

   b. Discuss briefly about MPFI engine. **(5)**

PART B

Answer any TWO full questions.

4) a) Describe the working of a vapor compression refrigeration system. **(10)**

   b) Define i) COP ii) Ton of refrigeration. **(5)**

5) a) Explain the working of a Window air conditioning system. **(10)**

   b) Distinguish between open and closed belt drives. **(5)**

6) a) Describe the major components of an automobile and explain their functions. **(15)**

   b) What are the different types of gears used in power transmission? **(5)**

PART C

Answer any TWO full questions.

7) a) Write a short note on different properties of engineering materials. **(10)**

   b) Give examples for five different alloys and state their applications. **(10)**

8) a) Explain the different types of rolling mills with suitable sketch. **(12)**

   b) Write a short note on shaping machine. **(8)**

9) a) What are CNC machines? How machining is done with such machines? **(10)**

   b) Briefly describe the different types of grinding machines. **(10)**

Total Pages: 1

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions. Each carries 15 marks.

1	a)	Explain the air standard Carnot cycle with neat sketches and derive the expression for efficiency.	(10)
	b)	1 kg of air at temperature 15^0C and pressure 100 kPa is taken through a Diesel Cycle. The compression ratio is 15 and heat added is 1850 kJ. Calculate the ideal cycle efficiency.	(5)
2	a)	Derive the characteristic gas equation using ideal gas laws.	(5)
	b)	Explain the working of a 4 stroke SI engine with neat sketches.	(10)
3	a)	Differentiate between open cycle and closed cycle gas turbines with neat sketches.	(10)
	b)	Explain the working of reciprocating pump with a neat sketch	(5)

PART B

Answer any two questions. Each carries 15 marks.

4	a)	Explain the various psychrometric processes involved in air conditioning using psychrometric chart.	(8)
	b)	Explain the working of a domestic refrigerator with neat sketch.	(7)
5	a)	Explain the impact of refrigerants on the environment.	(5)
	b)	Explain the gear terminology with neat sketch.	(10)
6	a)	Explain the following: - i) Cone clutch ii) Single plate clutch	(10)
	b)	What is a chain drive? Explain the roller chain with a neat sketch.	(5)

PART C

Answer any two questions. Each carries20 marks.

7	a)	Explain the following: - i) Hot chamber die-casting ii) Cold chamber die-casting	(10)
	b)	Briefly explain various forging operations.	(10)
8	a)	Explain various types of electrical resistance welding processes.	(10)
	b)	Differentiate between up milling and down milling.	(10)
9	a)	Explain the various operations that can be performed on a drilling machine.	(10)
	b)	Explain any two methods of taper turning with figures.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks Marks

1	a)	Why real gases deviate from ideal gas behaviour? Write ideal gas and real gas equations.	(5)
	b)	State the Zeroth law of thermodynamics. What is its significance?	(5)
	c)	In a Diesel cycle the compression ratio is 13 and cut off occurs at 8% of the stroke. Find the air standard efficiency.	(5)
2	a)	Compare two stroke and four stroke I.C. engines.	(5)
	b)	Differentiate between reciprocating and centrifugal pumps.	(5)
	c	What are Hybrid engines? State their advantages.	(5)
3	a)	Bring out the concept of entropy.	(5)
	b)	Define Cetane Number and Octane number.	(5)
	c)	Discuss the classification of hydraulic turbines.	(5)

PART B

Answer any two questions, each carries 15 marks

4	a)	Explain the working of a household refrigerator.	(10)
	b)	Define the following terms: i)WBT ii) DPT iii) Specific humidity iv) Relative Humidity	(5)
5	a)	Sketch the transmission system of an automobile. Mention the functions of each component.	(10)
	b)	Explain the various types of gear trains with the help of sketches.	(5)
6	a)	Draw the schematic diagram of a summer air conditioning system and explain the processes involved in it.	(10)
	b)	What are the functions of brake in an automobile? List the types of automobile. brakes.	(5)

PART C

Answer any two questions, each carries20 marks

7	a)	How engineering materials are classified? Mention at least one method of classification and application of each category.	(10)
	b)	Define the following terms: i) Strength ii) Hardness iii) Toughness of materials.	(10)
8	a)	Compare welding, brazing and soldering.	(5)
	b)	List five operations that can be performed on a drilling machine.	(5)
	c)	Describe the steps involved in powder metallurgy.	(10)
9	a)	Mark the parts of a latheon a neat diagram. List at least five operations that can be performed on it.	(10)
	b)	Write note on CNC machines.	(10)

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Total Pages: 1

Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2017

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks.

1	a)	Distinguish between open and closed systems. Quote one example each for them.	(5)
	b)	State zeroth law and first law of thermodynamics. What are their engineering significance?	(10)
2		With the help of proper thermodynamic diagrams derive the expression for air standard efficiency of an Otto cycle.	(15)
3	a)	State advantages and limitations of water tube boilers.	(5)
	b)	With the aid of neat sketch explain the working of fire tube boiler.	(10)

PART B

Answer any two questions, each carries 15 marks.

4	a)	What is an automobile? Discuss the classification of automobiles.	(10)
	b)	Discuss the impact of refrigerants on environment.	(5)
5		Draw a layout of an automobile.Explain the major components (any three) with help of neat diagrams.	(15)
6	a)	Describe the working of a window air conditioner with neat diagram.	(10)
	b)	Differentiate between a heat pump and a refrigerator. Show the relation between their COP's	(5)

PART C

Answer any two questions, each carries20 marks.

7	a)	What are the major properties of engineering materials?	(10)
	b)	Give a brief account of different types of engineering materials.	(10)
8	a)	What are the important types of metal joining processes?	(6)
	b)	Explain any two welding operations with neat diagrams.	(14)
9	a)	Using a block diagram, explain components of a CNC machine.	(10)
	b)	Explain the mechanism of shaping machine with the help of a neat sketch.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks. Marks

1	a)	Derive an expression to find the efficiency of an Otto cycle.	(10)
	b)	Write notes on hybrid engines.	(5)
2	a)	Explain the working of a medium pressure medium capacity boiler.	(10)
	b)	Differentiate between impulse and reaction turbines.	(5)
3	a)	Explain the working of centrifugal pump.	(10)
	b)	State I law of thermodynamics for a closed system undergoing a cyclic process.	(5)

PART B

Answer any two questions, each carries 15 marks.

4	a)	Explain the working of domestic refrigerator.	(10)
	b)	What are the industrial applications of air conditioning.	(5)
5		Write short notes on: i) Psychrometric chart ii) Gear trains iii) Impact of refrigerants on environment	(15)
6	a)	Explain the working of window air conditioner.	(7)
	b)	With a neat sketch explain the working of single plate clutch.	(8)

PART C

Answer any two questions, each carries 20 marks.

7	a)	Name any five engineering materials and state their properties which make them suitable for their respective applications.	(10)
	b)	Explain the process of forging stating different practical applications.	(10)
8	a)	List the operations that can be performed on a lathe.	(10)
	b)	Write notes on: - i) Extrusion ii) CNC Machines	(10)
9	a)	Explain the different die casting processes.	(10)
	b)	Write notes on any five machining processes possible with milling machine.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks Marks

1	a)	Why real gases deviate from ideal gas behaviour? Write ideal gas and real gas equations.	(5)
	b)	State the Zeroth law of thermodynamics. What is its significance?	(5)
	c)	In a Diesel cycle the compression ratio is 13 and cut off occurs at 8% of the stroke. Find the air standard efficiency.	(5)
2	a)	Compare two stroke and four stroke I.C. engines.	(5)
	b)	Differentiate between reciprocating and centrifugal pumps.	(5)
	c	What are Hybrid engines? State their advantages.	(5)
3	a)	Bring out the concept of entropy.	(5)
	b)	Define Cetane Number and Octane number.	(5)
	c)	Discuss the classification of hydraulic turbines.	(5)

PART B

Answer any two questions, each carries 15 marks

4	a)	Explain the working of a household refrigerator.	(10)
	b)	Define the following terms: i)WBT ii) DPT iii) Specific humidity iv) Relative Humidity	(5)
5	a)	Sketch the transmission system of an automobile. Mention the functions of each component.	(10)
	b)	Explain the various types of gear trains with the help of sketches.	(5)
6	a)	Draw the schematic diagram of a summer air conditioning system and explain the processes involved in it.	(10)
	b)	What are the functions of brake in an automobile? List the types of automobile. brakes.	(5)

PART C

Answer any two questions, each carries20 marks

7	a)	How engineering materials are classified? Mention at least one method of classification and application of each category.	(10)
	b)	Define the following terms: i) Strength ii) Hardness iii) Toughness of materials.	(10)
8	a)	Compare welding, brazing and soldering.	(5)
	b)	List five operations that can be performed on a drilling machine.	(5)
	c)	Describe the steps involved in powder metallurgy.	(10)
9	a)	Mark the parts of a latheon a neat diagram. List at least five operations that can be performed on it.	(10)
	b)	Write note on CNC machines.	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks.

			Marks
1	a)	5 kg of gas contained in a cylinder is fitted with a piston. 150 kJ of heat is transferred to the gas and simultaneously the piston is forced to compress the gas with an expenditure of work equivalent to 100 kJ. Determine the change in specific internal energy of the gas.	(5)
	b)	Derive an expression for the efficiency of a Carnot cycle.	(10)
2	a)	Explain the term CRDI.	(5)
	b)	With a neat sketch explain the working of a centrifugal pump.	(10)
3	a)	Explain the working of a reaction hydraulic turbine with a neat sketch.	(7)
	b)	With a neat sketch explain the working of a 2 stroke petrol engine.	(8)

PART B

Answer any two questions, each carries 15 marks.

4	a)	Explain desirable properties required for refrigerants.	(5)
	b)	With a neat sketch explain the working of a Vapour Compression Refrigeration system.	(10)
5	a)	Derive an expression for the ratio of belt tensions.	(10)
	b)	Explain the working of a window air conditioner with a neat sketch.	(5)
6	a)	Explain the major components of an automobile.	(5)
	b)	Derive an expression for the length of an open belt drive.	(10)

PART C

Answer any two questions, each carries 20 marks.

7	a)	Explain the function of runner and riser in sand casting.	(5)
	b)	List out the properties of moulding sand used in sand casting.	(10)
	c)	Explain different casting defects.	(5)
8	a)	With a neat diagram explain the main parts a lathe. Explain any four operations that can be carried out on a lathe.	(12)
	b)	Compare up milling and down milling processes with neat diagrams.	(8)
9	a)	State various advantages of CNC machines over conventional machines.	(5)
	(b)	Differentiate between soldering and brazing.	(5)
	(c)	Explain powder metallurgy. What are the different steps involved in powder metallurgy process?	(10)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST/SECOND SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks. Marks

1	a)	State Zeroth law of thermodynamics. Explain its significance.	(5)
	b)	Prove the equivalency of Kelvin Planck and Clausius statements.	(5)
	C)	Write a short note on thermodynamic work.	(5)
2	a)	Compare intensive and extensive properties with examples.	(5)
	b)	With the help of a neat diagram explain the working of a reaction steam turbine clearly showing the variation of steam pressure and velocity inside the turbine.	(10)
3	a)	Compare an open cycle and closed cycle gas turbine.	(5)
	b)	With the help of a neat diagram explain the working of 4 stroke cycle diesel engine.	(10)

PART B

Answer any two questions, each carries 15 marks.

4	a)	Write a short note on the impact of refrigerants on environment.	(5)
	b)	With neat sketches explain the working of window air conditioning system.	(10)
5	a)	Derive the expression for the ratio of belt tensions.	(10)
	b)	Write a short note on the classification of gears.	(5)
6	a)	Explain various desirable properties of refrigerants.	(4)
	b)	With a neat sketch explain the working of an internal expanding shoe brake.	(6)
	c)	Write a short note on major components of automobiles.	(5)

PART C

Answer any two questions, each carries20 marks.

7	a)	With the help of a neat diagram explain the thermit welding process.	(8)
	b)	Explain the extrusion process. Compare direct and indirect extrusion process.	(6)
	c)	Write a short note on various casting defects.	(6)
8	a)	Explain powder metallurgy. Narrate various steps in powder metallurgy.	(5)
	b)	With the help of a diagram mark the parts of a drilling machine. Explain any four operations performed on a drilling machine.	(8)
	c)	With neat sketches explain the up milling and down milling process.	(7)
9	a)	Explain different desirable properties of moulding sand.	(4)

(b) Compare different rolling mills with neat sketches. (8)

(c) With a neat sketch explain the principal parts of a shaper and discuss major operations performed in a shaper. (8)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FIRST SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks. Marks

1	a)	State and explain second law of thermodynamics.	(5)
	b)	Derive the expression for the efficiency of a Carnot cycle.	(10)
2	a)	Compare intensive and extensive properties with examples.	(5)
	b)	With the help of a neat diagram explain the working of an impulse steam turbine clearly showing the variation of steam pressure and velocity.	(10)
3	a)	With a neat diagram explain the working of a Cochran boiler.	(10)
	b)	Compare an open cycle and closed cycle gas turbine.	(5)

PART B

Answer any two questions, each carries 15 marks.

4	a)	Define the following terms: (i) absolute humidity (ii) relative humidity (iii) DBT (iv) WBT and (v) Sensible heat.	(5)
	b)	With neat sketches explain the working of vapour compression refrigeration system.	(10)
5	a)	With a neat sketch explain the working of a domestic refrigerator.	(10)
	b)	With a neat sketch explain an epicyclic gear train.	(5)
6	a)	With a neat sketch explain the working of a single plate clutch.	(10)
	b)	Two mating spur gears have 60 and 40 teeth. Their common module is 5 mm. Determine centre to centre distance between the gear axes.	(5)

PART C

Answer any two questions, each carries 20 marks.

7	a)	With the help of a neat diagram explain the arc welding process.	(8)
	b)	Explain the extrusion process. Compare direct and indirect extrusion process.	(6)
	c)	Explain important mechanical properties of materials.	(6)
8	a)	Explain forging process. With suitable diagrams discuss any four forging operations.	(8)
	b)	With the help of a flow diagram explain the principle of numerical control machine.	(8)
	c)	Explain any four operations performed on a lathe.	(4)
9	a)	Explain various casting defects.	(8)
	(b)	Explain the steps involved in powder metallurgy process.	(6)
	(c)	Compare up milling and down milling process.	(6)

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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech examinations (S) September 2020 S1/S2 (2015 Scheme)

Course Code: ME100

Course Name: BASICS OF MECHANICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two questions, each carries 15 marks.

			Marks
1	a)	State Zeroth law of thermodynamics. Explain its importance.	(5)
	b)	Explain entropy. "Entropy of the universe is increasing", comment.	(5)
	c)	Explain various thermodynamic systems with examples.	(5)
2	a)	Derive an expression for the efficiency of an Otto cycle.	(10)
	b)	Compare two stroke and four stroke internal combustion engines.	(5)
3	a)	With a suitable sketch explain the working of a reciprocating pump.	(10)
	b)	Write any five differences between fire tube and water tube boiler.	(5)

PART B

Answer any two questions, each carries 15 marks.

4	a)	Explain the impact of refrigerants on environment.	(5)
	b)	With a neat sketch explain the working of a domestic refrigerator.	(10)
5	a)	Explain psychrometry. Differentiate between specific humidity and relative humidity.	(5)
	b)	Explain different types of gear trains with neat sketches.	(10)
6	a)	Explain various classifications of automobiles.	(5)
	b)	An open belt drive transmits 30 kW with a belt velocity of 5 m/s. Determine the tensions on each side of the belt, if the coefficient of friction is 0.28 and angle of lap is 180^0.	(10)

PART C

Answer any two questions, each carries20 marks.

7	a)	Explain the rolling process. With neat sketches explain different types of rolling mills.	(8)
	b)	Explain the extrusion process. Compare direct and indirect extrusion process.	(6)

	c)	Explain important mechanical properties of materials.	(6)
8	a)	With a neat diagram explain the main parts of a drilling machine. Explain any four operations performed on a drilling machine.	(12)
	b)	Compare up milling and down milling processes with neat diagrams.	(8)
9	a)	With a neat sketch explain an arc welding process.	(7)
	(b)	With a neat diagram explain the main parts a shaping machine.	(8)
	(c)	Explain any five casting defects.	(5)

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