Code No: R201227 **R20** SET - 1

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

(Only EEE)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

UNIT - I

1	a)	A cantilever beam AB span 6m is subjected to a uniformly varying load of 8 kN/m intensity at the fixed end A and zero at the free end B. draw SFD and BMD	(10M)
	b)	What are the different types of beams possible - describe the behavior of each of them	(4M)

Or

2	a)	Draw the S. F. and B.M. diagrams for a cantilever with a point load at the free end and u.d.l & throughout	(8M)
	b)	Define: i. Bending moment. ii. Shear force. iii. Point of contraflexure	(6M)

UNIT - II

3		What are the basic characteristics of a Strain gauge? Write a a brief note in Electrical resistance Strain gauges.	(14M)

Or

4	a)	Explain about Triangular strain rosettes	(7M)
	b)	Write about multi-channel strain indicators	(7M)

UNIT - III

5	a)	How do you detect defects in timber? Explain.	(7M)
	b)	Distinguish between mild steel and hard steel.	(7M)

Or

6	a)	what are the different shapes in which bricks are formed, discuss them	(7M)
	b)	Write briefly i) Fire-clays. ii) Fire-bricks Sand-lime bricks.	(7M)

UNIT - IV

7	a)	What is a hydraulic turbine? How are hydraulic turbines classified?	(6M)
	b)	Explain the construction and working of any one reaction turbine with a neat sketch.	(8M)

Or

8	a)	With a neat sketch explain the construction and working of a centrifugal pump.	(7M)
	b)	Discuss the concept of pumps connected in series and pumps connected in parallel.	(7M)

UNIT - V

9	a)	Classify Internal Combustion engines.	(6M)
	b)	Explain the working of 4 stroke Diesel engine with neat sketch.	(8M)

Or

10	a)	Differentiate between Fire tube and water tube boilers.	(7M)
	b)	What are Boiler mountings? List out the mountings used in boilers and explain the working of any one mounting with relevant sketch.	(7M)

|''|''|||''|'''|||'|

Code No: R201227 **R20** SET - 2

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

(Only EEE)

Time: 3 hours Max. Marks: 70

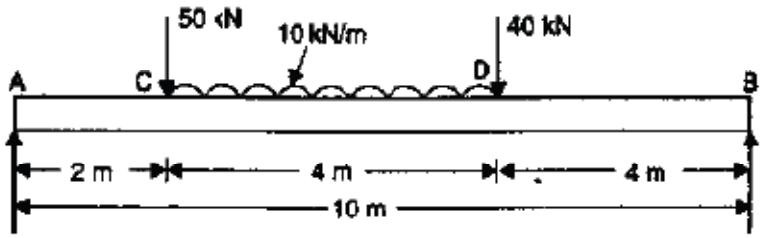
Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

~~~~~~

1	a)	A horizontal beam 10m long is carrying a U.D.L of 1KN/m. The beam is supported on two supports 6m apart. Find the position of the supports, so that B.M on the beam is as small as possible. Also draw the S.F.D & B.M.D	(8M)
	b)	Define a)Hooke's law b)working Stress c) Factor of safety?	(6M)

Or

2	a)	A simply supported beam of length 10m, carries the uniformly distributed load and two point loads as shown in Fig. Draw the S.F and B.M diagram for the beam and also calculate the maximum bending moment	(8M)



	b)	List different types of supports? Draw various types of beams	(6M)

UNIT - II

3		What are strain rosettes? What are their uses? For a rectangular rosette on a steel specimen εA = -600 x 10-6 , εB = 300 x 10-6 , εC = 400 x 10-6. Determine the principal strains, principal stresses and directions Esteel = 210 Gpa	(14M)

Or

4	a)	Explain the basic principle of unbonded metallic strain gauges	(7M)
	b)	Write about Rectangular Rosette analysis.	(7M)

UNIT - III

5	a)	Explain different types of shakes in timber.	(7M)
	b)	Differentiate between exogenous trees and endogenous trees.	(7M)

Or

6	a)	Describe the properties of mild steel.	(7M)
	b)	Explain defects in timber due to fungi.	(7M)

|''|''|||''|'''|||'|
~~~~~~

UNIT - IV

7	a)	With the help of neat diagram explain the construction and working of an impulse turbine.	(7M)
	b)	What is a hydraulic turbine? Discuss the factors to be considered in selecting a hydraulic turbine.	(7M)

Or

8	a)	Compare reciprocating pumps and centrifugal pumps.	(7M)
	b)	Explain the working of a double acting reciprocating pump with a neat sketch.	(7M)

UNIT - V

9	a)	Compare two stroke and four stroke internal combustion engines.	(7M)
	b)	With a neat sketch explain the valve time diagram of a four stroke petrol engine.	(7M)

Or

10	a)	Explain the construction and working of Cochran Boiler.	(7M)
	b)	With a neat sketch explain the construction and working of fusible plug.	(7M)

Code No: R201227 **R20** SET - 3

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

(Only EEE)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

UNIT - I

1	a)	Draw the S.F and B.M diagram for a simply supported beam of span Lm loaded with UDL of wKN/m.	(10M)
	b)	Define the 'Beam' and the type of action and deformation it undergoes	(4M)
		Or	
2	a)	A beam is 7m long and is simply supported at 2.5m from the other end .There is a uniformly distributed load of 30kn per meter over together with point loads of 60kn at 1.5from 3m sketching the bending moment and shear force diagram. Calculate the maximum B.M and the point at which it occurs.	(12M)
	b)	What is Torsion? Write briefly	(2M)

UNIT - II

3		Explain about electrical resistance and mechanical type of strain gauge.	(14M)
		Or	
4		Write about the performance characteristics of wire and foil strain gauges.	(14M)

UNIT - III

5		Explain the various methods of timber seasoning stating relative advantages and disadvantages.	(14M)
		Or	
6	a)	Discuss the Classification and uses of Glass.	(7M)
	b)	Explain the constituents of good brick earth.	(7M)

UNIT - IV

7	a)	Give the comparison between impulse and reaction turbines.	(7M)
	b)	Draw a schematic diagram of a Francis turbine and explain briefly its construction and working.	(7M)
		Or	
8	a)	Classify hydraulic pumps and discuss their applications.	(7M)
	b)	What is an air vessel? What are its uses? Explain with neat sketches the function of air vessels in a reciprocating pump.	(7M)

UNIT - V

9	a)	Explain the working of four stroke petrol engine with neat sketch.	(8M)
	b)	Discuss the fuel supply system of a petrol engine.	(6M)
		Or	
10	a)	Explain the construction and working of Babcock and Wilcox Boiler.	(7M)
	b)	What is the function of water level indicator? Explain its working with a neat sketch.	(7M)

Code No: R201227 **R20** SET - 4

I B. Tech II Semester Regular/Supplementary Examinations, August- 2022

BASIC CIVIL AND MECHANICAL ENGINEERING

(Only EEE)

Time: 3 hours Max. Marks: 70

Answer any five Questions one Question from Each Unit
All Questions Carry Equal Marks

UNIT - I

1	a)	A simply supported beam of length 6m, carries point load of 3kN and 6kN at distances of 2m and 4m from the left end. Draw the shear force and bending moment diagram for the beam	(10M)
	b)	Define shear force and bending moment.	(4M)
		Or	
2	a)	A cantilever beam of length 2m carries a uniformly distributed load of 2 kN/m over the whole length and a point load of 3 kN at the free end. Draw the SF and BM diagrams.	(10M)
	b)	Define i) Force ii)Stress iii) Strain iv)Elasticity	(4M)

UNIT - II

3	a)	Explain about the three element rectangular rosette	(7M)
	b)	Draw any three types of Strain gauges	(7M)
		Or	
4	a)	Explain about the Measurement of Strain	(7M)
	b)	Draw wheat stone bridge and explain	(7M)

UNIT - III

5		Explain the following defects in timber : (a) Due to conversion (b) Due to fungi (c) Due to insects (d) Due to seasoning.	(14M)
		Or	
6	a)	Explain different ways of classification of timber.	(7M)
	b)	How moisture content of timber is determined.	(7M)

UNIT - IV

7	a)	With a nest sketch explain the construction and working of a single acting reciprocating pump.	(9M)
	b)	What is priming? Why is it required for centrifugal pumps? Explain.	(5M)
		Or	
8	a)	State the advantages and disadvantages of an impulse turbine over a Reaction turbine.	(7M)
	b)	Explain the construction and working of a pelton wheel.	(7M)

UNIT - V

9	a)	With a neat sketch explain the port timing diagram of two stroke petrol engine.	(8M)
	b)	Differentiate between petrol and diesel engines.	(6M)
		Or	
10	a)	Explain the construction and working of Benson Boiler.	(7M)
	b)	What are Boiler Accessories? List out the Accessories used in boilers and explain the working of any one Accessori with relevant sketch.	(7M)