

				Sı	ıbje	ct C	ode:	KN	<b>/IE1</b>	01T	
Roll No:											

Printed Page: 1 of 2

# BTECH (SEM I) THEORY EXAMINATION 2021-22 FUNDAMENTALS OF MECHANICAL ENGINEERING & MECHATRONICS

Time: 3 Hours Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

#### SECTION A

1	Attempt <i>all</i> questions in brief.
	Attempt an onestions in oriet.

b. Discuss about superposition theorem. c. Discuss the terms used in IC engine - TDC, BDC, Stroke and Bore. d. Write the any six components of IC Engine. e. Discuss the equation of continuity.	arks	CO
b. Discuss about superposition theorem. c. Discuss the terms used in IC engine - TDC, BDC, Stroke and Bore. d. Write the any six components of IC Engine. e. Discuss the equation of continuity.		
c. Discuss the terms used in IC engine - TDC, BDC, Stroke and Bore. d. Write the any six components of IC Engine. e. Discuss the equation of continuity.	2	1
d. Write the any six components of IC Engine. e. Discuss the equation of continuity.	2	1
e. Discuss the equation of continuity.	2	2
•	2	2
	2	3
f. Write any four properties of fluid.	2	3
g. Differentiate between precision and accuracy.	2	4
h. What is the absolute pressure experienced by a pressure sensor, if the atmospheric pressure of a fluid is 2 atm, gauge pressure is 5 atm and differential pressure is 3 atm?	2	4
i. Differentiate active and passive transducers.	2	5
j. What is the function of an accumulator?	2	50

#### SECTION B

### 2. Attempt any *three* of the following:

	_			
1 (1	7		7 A	
	v	=	30	
	$\Lambda$		J41	

 $2 \times 10 = 20$ 

Attel	input any intree of the following.	$\mathbf{X} \mathbf{J} - \mathbf{J} \mathbf{U}$	
Q.	Question	Marks	CO
no.		6.	
a.	Draw S.F.D. and B.M.D. for simply supported beam carrying a	10	1
	uniformly distributed load W (KN/m) throughout its length L (m).		
	What is the maximum bending moment?		
b.	Explain the working of four stroke petrol engine with diagram.	10	2
c.	Explain the working and construction details of reciprocating pump.	10	3
d.	Explain the construction and working of optical pyrometer.	10	4
e.	Discuss the various key elements of a mechatronics system and write	10	5
	any four-mechatronics system.		

### SECTION C

3. Attempt any *one* part of the following:  $10 \times 1 = 10$ 

Q.	Question	Marks	CO
no.			
a.	Draw S.F.D. & B.M.D. for fig. shown below-	10	1
	7,0		
	20 tài An.		
	3m — 15m — 1m — 3		
b.	Develop the relationship between E (Young's modulus), C (Shear	10	1
	modulus), K (Bulk modulus) and μ (Poisson ratio).		



Printed Page: 2 of 2
Subject Code: KME101T
Roll No:

## BTECH (SEM I) THEORY EXAMINATION 2021-22 FUNDAMENTALS OF MECHANICAL ENGINEERING & MECHATRONICS

4. Attempt any *one* part of the following:  $10 \times 1 = 10$ 

Q.	Question	Marks	CO
no.			
a.	Compare the following-	10	2
	(i) SI Engine and CI Engine		
	(ii) 4-stroke Engine and 2-stroke Engine		
b.	Explain the working of vapour compression refrigeration system by	10	2
	T-S diagram with related block diagram.		

5. Attempt any *one* part of the following:  $10 \times 1 = 10$ 

Q.	Question	Marks	CO
no.			
a.	What are the parts of venture meter? Derive a formula to measure the rate of flow of a liquid through venturi meter.	10	3
	$Q = \frac{a_1 a_2}{\sqrt{a_1^2 - a_2^2}} \sqrt{2gh}$		
b.	What is Turbine? Explain construction details of Pelton Turbine with	10	30
	diagram.		O'X

6. Attempt any *one* part of the following:  $10 \times 1 = 10$ 

Q.	Question	Marks	CO
no.			
a.	Explain in detail with suitable diagram – (i) Limit and their types (ii)	10	4
	Fits and their types.		
b.	Define pressure. Write the classification of pressure measurement	10	4
	instruments. Explain the working of bourdon tube pressure gauge		
	with neat sketch.		

7. Attempt any *one* part of the following:  $10 \times 1 = 10$ 

Q.	Question	Marks	CO
no.			
a.	What is Sensor? Explain classification of sensors based on various	10	5
	Inputs and Outputs.		
b.	Explain different types of "Mechanical Actuation system" based on	10	5
	power inputs.		